Pullen, Steve, NMENV

From: Blankenship, Bill <bblankenship@lanl.gov>
Sent: Monday, October 20, 2014 10:52 AM
To: Huddleson, Steven, NMENV; Hardison, Cember, NMENV
Subject: NPR approval for TA50 RLWTF thermal evaporator
Attachments: Final_NPR_Request_Evaporator.pdf; No Permit Required (2195-U).pdf

Steve and Cember –

Here is the LANL NPR request, and AQB approval, for the thermal evaporation unit at the TA50 Radioactive Liquid Waste Treatment Facility. You mentioned CCNS and others were inquiring in regards to air permitting.

Bill

Bill Blankenship
LANL Air Quality Team
(505) 665-0823

: 12802

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Environmental Stewardship Group
P.O. Box 1663, MS J978
Los Alamos, New Mexico 87545
(505) 665-8855/FAX: (505) 665-8858

Date: September 1, 2010
Refer to: ENV-ES: 10-167

Ted Schooley
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, New Mexico 87507

IDEA ID NO. 856 - LOS ALAMOS NATIONAL LABORATORY
NO PERMIT REQUIRED DETERMINATION
ENCON THERMAL EVAPORATOR

Dear Mr. Schooley:

Los Alamos National Laboratory (LANL) submits for review a request for a No Permit Required (NPR) determination for a new natural gas-fired thermal evaporation unit. This unit is intended for use in evaporating clean and treated water from the existing LANL Radioactive Liquid Waste Treatment Facility (RLWTF) located within Technical Area (TA) - 50. Maximum potential to emit emissions are below thresholds which would require a Notice of Intent application under 20.2.73 NMAC.

In addition to the information provided below, the following attachments are enclosed:

- Attachment 1 – Manufacturer Specifications Information
- Attachment 2 – Emission Estimates
- Attachment 3 – RLWTF Treated Effluent Annual Sample Results

The existing RLWTF receives and treats wastewater from numerous facilities located at LANL. Wastewater is treated and discharged under an EPA NPDES permit. Recent revisions to the NPDES permit for this outfall contain extremely low discharge limits for copper (0.14 ppb) and zinc (2.2 ppb). In conjunction with other treatment technologies, the additional step of evaporating the treated wastewater is necessary to assure that compliance with the revised discharge limits is maintained.

A natural gas-fired evaporation unit manufactured by ENCON has been chosen to use for evaporation of the treated wastewater. Water is heated by a 4.5 MMBtu/hr Low-NOx burner. This unit can treat up to 400 gallons of water per hour. Water droplets in the exhaust are collected and controlled by stainless steel mesh filters. See Attachment 1 for a full description of the unit.

Attachment 2 contains emission estimates for the proposed operation of the evaporator. With respect to criteria pollutants, maximum emission rates are estimated to be 0.4 lb/hr and 1.9 tons/year for NOx and 0.4 lb/hr and 1.6 tons/year CO. Attachment 2 also contains predicted maximum emissions for hazardous air pollutants and 20.2.72 NMAC toxic air pollutants. Since the treated water is quite clean, emissions of these classes of compounds are minimal. Total emissions of hazardous air pollutants are estimated to be 0.04 tons per year. Maximum toxic air pollutant emissions are well below the applicable lb/hr permit threshold for each compound. Attachment 3 contains a table from an annual report for the RLWTF showing treated water sampling results for individual compounds used in estimating emissions. The maximum annual value for each constituent was used in the emission calculations.

There is an existing boiler in TA-50 which is a regulated source in LANL's Title V operating permit. Attachment 2 also contains emission estimates for this nearby source should this aid the NPR determination. Total combined emissions for this boiler and the proposed evaporator are 7.3 tons/year NOx and 6.1 tons/year CO if each unit operated 8,760 hours per year.

Thank you for consideration of our request. Please contact Bill Blankenship at 665-0823 for additional information.

Sincerely,

Patricia E. Gallagher

Patricia E. Gallagher
Group Leader
ENV-ES

PG/mcm

Cy:
Carl A. Beard, ADSMS, MS E585
Robert Mason, TA55-DO, MS E583
Dennis Hjeresen, ENV-DO, MS K404
Bill Blankenship, ENV-ES, MS J978
Steve Story, ENV-ES, MS J978
Rebecca Clark, ENV-ES, MS J978
Cindy Blackwell, LC-LESH, A187
Hugh McGovern, TA-55-RLW, MS E518
Clark de Nevers, ES-55, MS E518
Chris Del Signore, TA-55-RLW, E518
Steve Fong, LASO-CMRR, MS E550

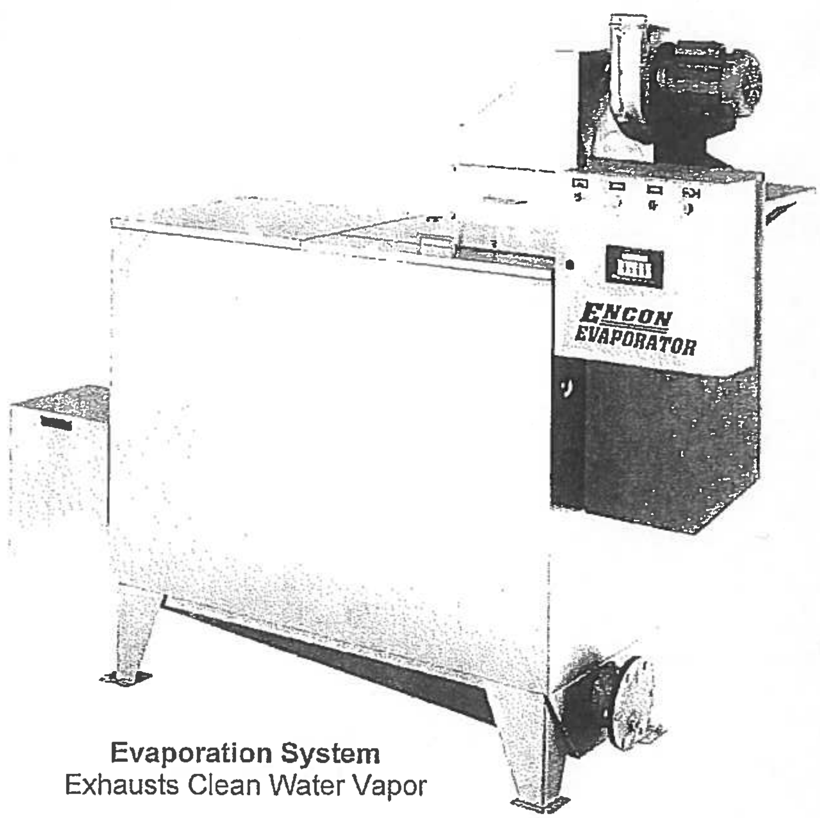
Attachment 1

Manufacturer Specifications Information

THERMAL EVAPORATOR

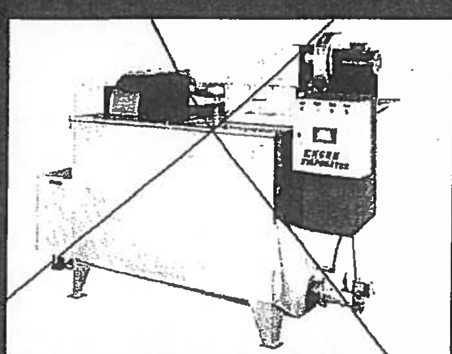
Cost Effective Wastewater Minimization

- ✓ Handles Different Wastewater Streams...Simultaneously!
- ✓ Dramatically Reduces Disposal Volume and Cost
- ✓ Eliminates Need to Discharge Wastewater
- ✓ Easy to Install and Operate
- ✓ Helps Reduce the Costs and Liabilities of Waste Disposal
- ✓ A Wide Variety of Heat Sources including:
  - Natural Gas
  - Propane
  - Steam
  - #2 Fuel Oil
  - Diesel
  - Kerosene
  - Electricity
  - Waste Oil
  - Off-Spec Landfill Gas



Evaporation System
Exhausts Clean Water Vapor

Distillation System
Converts Wastewater to Clean Water



www.evaporator.com

ENCON
ENERGY CONSCIOUS INNOVATION

ENCON Evaporation and Distillation Systems are engineered to provide you with the most effective and economical method of wastewater minimization possible.

All ENCON systems are assembled with the highest quality components, ensuring years of trouble free operation.

Our unique heat exchanger design on our thermal units provides extremely efficient heat transfer, resulting in reduced fuel costs.

Key to the effectiveness of out ENCON Thermal Evaporators is the Mist Eliminator. This feature captures unwanted contaminants before exhausting, thus enabling you to comply with today's stringent emissions regulations (evaporation) or to return high quality water to your process (distillation).

Put Our Engineering and Regulatory Expertise to Work for You

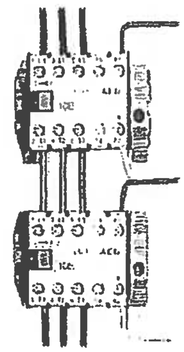
ENCON Evaporators provides the following services relative to evaporation/distillation projects:

- Free wastewater qualification analysis to ensure application feasibility
- Regulatory compliance and paperwork
- System design and compliance for hazardous waste applications
- PLC programming to optimize system automation
- Closed loop recycling evaluation and analysis

High Quality Components and Superior Design

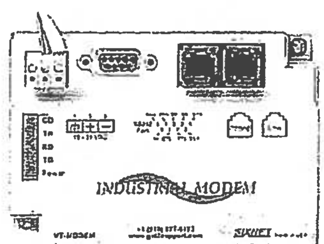
PLC Control Panel

NEMA 4 PLC control panel provides scrolling readout of wastewater and heated air temperatures, mist pad pressure, plus alarm and operating conditions for maximum operator feedback. The panel also includes a built-in cycle timer.



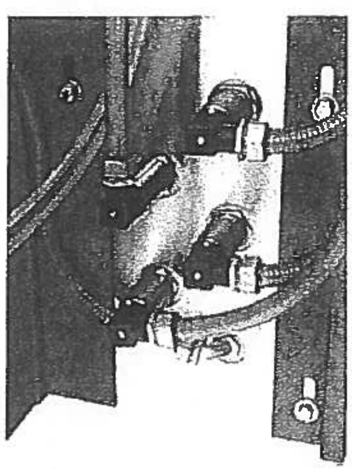
Built-in Modem

Every control panel has a built-in modem for a non-dedicated phone line. This modem allows for easy remote program modifications and/or troubleshooting of the system by ENCON personnel.

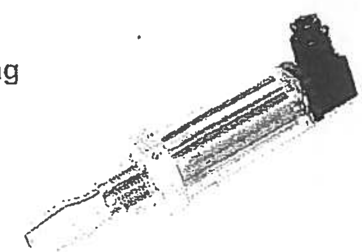


Redundant Burner Contactors

Each burner has a duty contactor and a redundant contactor. This design ensures maximum safety by opening the redundant contactor in the event the duty contactor should fail electrically or mechanically.



Level Sensing

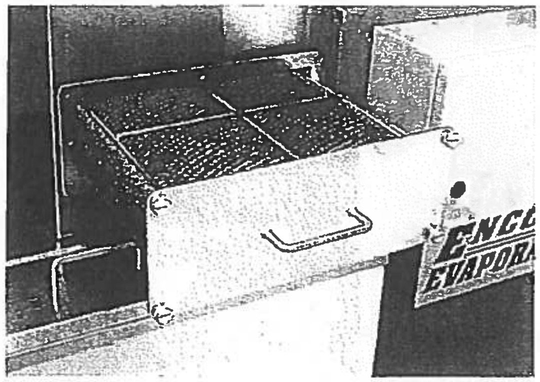


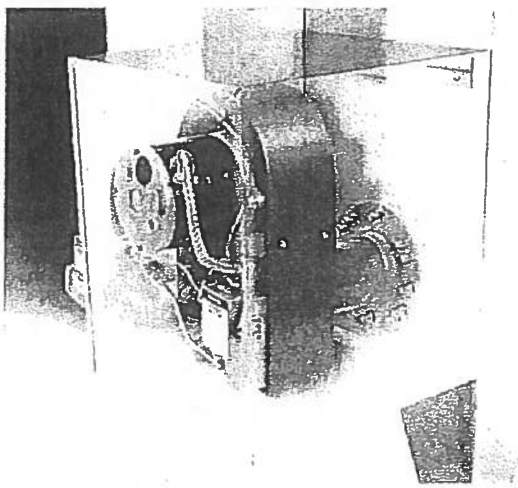
Tuning fork level probes provide reliable auto-filling and shutdown operations even in conditions of severe foam. The durable level probes are made of stainless steel for excellent corrosion resistance. Hastelloy level probes are available for highly corrosive applications.

Result in Excellent Long Term Performance!!!

Mist Eliminator System

The stainless mesh filter is designed for easy removal from its compression fit housing. The system is monitored for contaminant loading and airflow, which is interlaced to the control panel for maximum operator feedback.



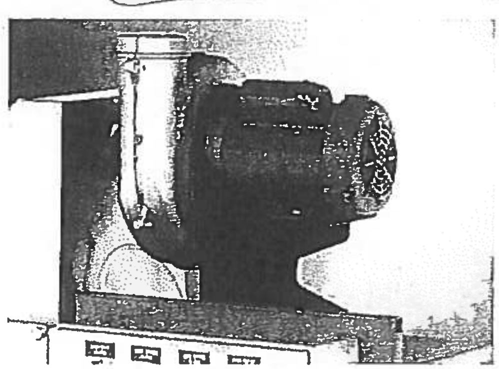


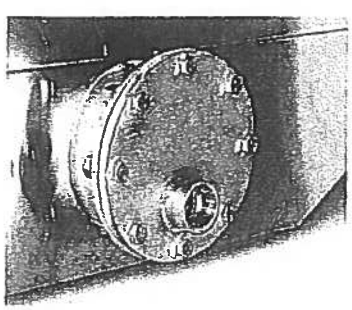
Forced Draft Burner

Each fuel heated system consists of a burner with: Honeywell controls; pressure gauge and gas volume meter for monitoring gas inlet conditions; airflow detection and lockout; spark ignition; redundant main valve and burner contactors for maximum safety. FM gas trains and gas flow transmitters are standard on larger systems. The stainless steel burner protection shroud is mounted on a track hanger for ease of removal and reattachment. Natural gas, Propane, Dual Fuel, Oil, Diesel, Waste Oil and Low NO_x burners are available.

Blower System

1725 RPM, TEFC Motor with Class B Insulation rated for high temperatures. Extremely quiet operation and as much as three times the longevity of 3450 RPM motors. Heavy gauge aluminum blower provides durability and longevity.





Cleanout Flange

Large six inch cleanout with flange cover and a 1 ½" NPT fitting for pump connection and ease of residue removal.

Before purchasing an evaporation or distillation system, challenge the vendor to explain their mist eliminator design.

Over the years, evaporators have been notorious for exhausting contaminants, which can be detrimental to the environment. Effective mist capturing systems must have the following features in order to pass the ever tightening federal and state environmental regulations:

- Compression fit mist pad to capture entrained contaminants
- Mist pad rated to 10 microns or less to capture even the smallest droplets
- Stainless steel mist pad and housing to ensure long term integrity and aesthetics
- Adequate buffer zone between the water level and mist pad, to allow fallback of the contaminants
- Monitoring of mist pad loading to ensure consistent airflow and evaporation rates
- Easy removal of the mist pad to minimize manpower requirements

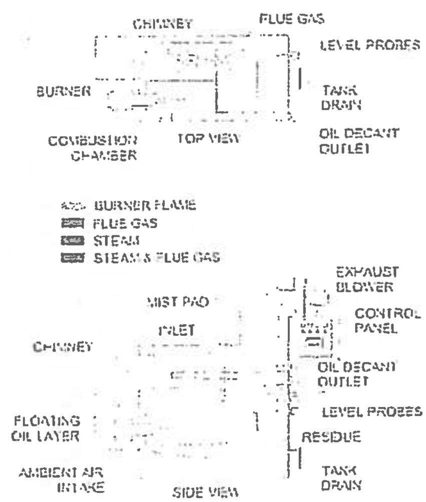
Typical Operation

1. Wastewater is either pumped or gravity fed into the system through a 1" NPT fitting on lid.
2. As the wastewater flows into the system and reaches the low-low level probe, the burner(s) will fire.
3. Wastewater will continue to feed until it reaches the high-auto level probe.
4. The burner(s) fire into the combustion chamber and the hot gases travel past the vertical tubes inside the heat exchanger until they reach the insulated chimney outside the evaporator tank (see Exhaust Scenarios).
5. The wastewater is heated to boiling and is driven off as clean water vapor.
6. As the water vapor is driven off, the liquid level will gradually fall to the low-auto level probe. Upon reaching the low-auto level, the system will refill itself to the high-auto level.
7. This process will continue until either the water reaches the high temperature set point or the cycle timer counts down to zero.

We Encourage You to Speak to Our Valued Clients about the ENCON Systems and Our Superior Customer Service

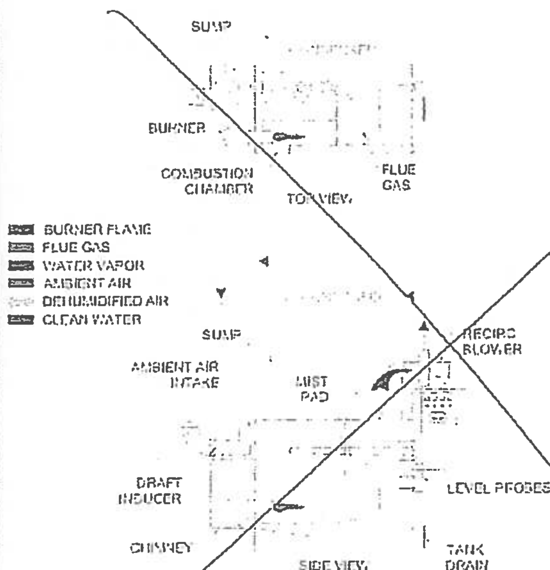
Exhaust Scenarios

Evaporation System



The flue gases are pulled back into the evaporator, mixed with the ambient air and drawn across the surface of the boiling water. The exhaust blower pulls the combined steam and gases through the mist eliminator and pushes them up through the stack and outside the building.

Distillation System



The flue gases are not pulled back into the evaporator. Instead, they are vented separately up their own stack. The recirculation blower pulled the steam through the mist eliminator and pushed it through the condenser. The clean water is directed to a sump and the dehumidified air is returned to the system.

ENCON Evaporators
97 Eddy Road, Unit #6 • Manchester, NH 03102-3226 USA
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www.evaporator.com • sales@evaporator.com

ENCON EVAPORATORS

MODEL	EVAPORATION RATE (Gals/Hour)	BTU's	TANK CAPACITY (Gallons)	DIMENSIONS (Inches) L x W x H	BLOWER DESCRIPTION CFM HP RPM	CLEAN-OUTS	VENT OD
N3V1-10	10	118,750	70	68x28x72	200 .50 1725	4"+ 1.5" NPT	4"
N3V1-18	18	220,000	115	80x28x83	300 .50 1725	6" + 1.5" NPT	4"
N3V1-28	28	327,000	165	100x28x83	450 .75 1725	6" + 1.5" NPT	5"
N3V1-35	35	380,000	330	100x52x84	575 .75 1725	6" + 1.5" NPT	6"
N3V1-48	48	520,000	330	100x52x84	780 1.5 1725	6" + 1.5" NPT	6"
N3V1-60	60	650,000	408	112x57x86	975 1.5 1725	6" + 1.5" NPT	8"
N3V1-72	72	780,000	408	112x57x86	1200 1.5 1725	6" + 1.5" NPT	8"
N3V2-96	96	1,040,000	535	158x52x108	1600 5.0 VFD	6" + 1.5" NPT	10"
N3V2-126	126	1,370,000	735	142x77x110	2340 5.0 VFD	6" + 1.5" NPT	10"
N3V2-165	165	1,740,000	735	142x77x110	3000 5.0 VFD	6" + 1.5" NPT	12"
N3V2-192	192	2,100,000	835	156x82x110	3125 10.0 VFD	6" + 1.5" NPT	12"
~~N3V2-260~~	~~260~~	~~2,954,000~~	~~835~~	~~156x82x110~~	~~4000 10.0 VFD~~	~~6" + 1.5" NPT~~	~~12"~~
N3V2-400	400	4,544,000	1,600	191x101x120	6000 7.5 VFD	6" + 1.5" NPT	16"

AVAILABLE FEATURES

HEAT SOURCE:

Natural Gas
Propane Gas
Oil, Diesel, Kerosene
Electricity
Steam
Waste Oil
Off-Spec Gas

MATERIALS OF CONSTRUCTION:

Stainless Steel 316L (SS316L) - standard
6% Moly Super Stainless Alloy
Hastelloy C

CONTROL LOGIC:

PLC w/Modem and Auto-Fill – standard
Auto-Dump – option
Auto-Decant - option

MISCELLANEOUS:

Condensers
Combustion Analysis Kit
Air Diaphragm Pumps
Holding Tanks
Air Fluid Coolers
Permitting Services

~~CONTROLS~~

BURNER CONTROLLER: Honeywell
TEMPERATURE CONTROLLERS: Thermocouple via PLC
CONTROL INPUTS:

* 3 Frequency Shift Level Probes
* 1 Air Intake Thermocouple
* 1 Redundant Low Water Level Shut-Off
* Gas Volume Pulse per Burner (N3V2-96 and >)
* 1 Primary Water Thermocouple
* Redundant Burner Contactors for Safety Shutdown
* 1 Differential Pressure Transducer for Contaminant Loading

PLC w/MODEM CONTROL PANEL: Watertight Main Enclosure NEMA 4/12/13

* 2 Selector Switches – Main Power, Manual Fill
* 1 Keypad for Setpoint Modification
* 1 LCD Display for all status and alarm conditions including: liquid temperature, high liquid temperature shut off, air inlet temperature, high air temperature shut off, mist pad loading, level probe malfunction, cycle timer
* 2 Indicator Lamps – Main Power, Burner
* 1 Warning Lamp – All Alarm Conditions

FABRICATION

TANK: SS316L, 14 Gauge
6% Moly and Hastelloy C available
HEAT EXCHANGER: SS316L
6% Moly and Hastelloy C available
SKINS: SS304 Grained Finish
INSULATION: 1" Thick on all 6 sides, Rated to 450F

QUALITY

PRESSURE TEST: On Heat Exchanger
LEAK TEST: Dye Penetrant Test on Welded Tank
COMBUSTION GAS ANALYSIS: Test for excess Oxygen and Gas Exit Temperatures
I/O SIMULATION: Ensure accuracy of Controls

Rev. 2/28/10

ENCON EVAPORATORS*1368 HOOKSETT ROAD, UNIT 9*HOOKSETT, NH 03106*603/624-5110*603/627-9520
WESTERN REGIONAL SALES OFFICE*949/709-5732*949/709-5753fax

PROCESS DESCRIPTION OF GAS/OIL FIRED ENCON EVAPORATORS

1. Wastewater is collected in a primary holding tank/sump.

2. Water is either pumped or gravity fed into the evaporator through a 1" NPT fitting on lid.

3. The four (4) level controls in the standard auto-fill system provide the following:
   a) The low-low level controls the burner(s) operation (on/off).
   b) The low-auto level initiates the fill sequence, through the feed pump or actuated ball valve.
   c) The high-auto level stops the fill sequence.
   d) The high-high level acts a redundancy to the high auto level.

4. As the fluid flows into the evaporator and reaches the low-low level, the burner(s) will light.

5. Fluid will continue to flow until it reaches the high-auto level. The feed pump or actuated ball valve will be de-energized/closed.

6. As the fluid comes to a boil and begins the evaporation process, the liquid level will drop down to the low-auto level. The feed pump or actuated ball valve will be energized and more fluid will be fed into the Evaporator.

7. This process will continue until either the fluid temperature reaches the high set point or the optional cycle timer counts down to zero.

8. When activated, the burner(s) will fire into the combustion area of the heat exchanger. The hot gases travel around the vertical tubes inside the heat exchanger until they reach the insulated chimney outside the evaporator tank. There are two ways the flue gases and water vapor may be vented:

   a) If the customer has chosen an Evaporation Unit (vent to atmosphere), the hot gases are pulled back into the Evaporator above the liquid level and drawn across the water's surface by the exhaust blower. The exhaust blower pulls the combined water vapor and flue gases through the mist eliminator and pushes them through the stack to the outside of your building.

   b) If the customer has chosen the "closed loop" Distillation Unit (condenser package), the hot gases are not pulled back into the Evaporator. Instead, the flue gases are vented separately up their own exhaust stack. The blower pulls only the water vapor through the mist eliminator and pushes it through the connection from the blower exhaust to the inlet side of the condenser, which is horizontally mounted, on the backside of the evaporator tank. The water leaving the condenser is separated from the air stream and directed to an automated condensate sump while the air stream is returned to the evaporator.

Attachment 2

Emission Estimates

Emission Estimates - ENCON Thermal Evaporator

Operational Data

Fuel		
Natural gas		
Heat Content		1030 Btu/scf
Sulfur Content		2 grains/100 scf
Existing Boiler TA-50-2-BS-1		
	Maximum heat input	12.6 MMBtu/hr
	Maximum fuel input	0.012 MMscf/hr
ENCON Thermal Evaporator		
	Maximum heat input	4.54 MMBtu/hr
	Maximum fuel input	0.004 MMscf/hr
	Maximum evaporation rate	400 gallons/hr

Notes

1 Boiler maximum heat input is nameplate rated capacity and is not derated for altitude. Actual capacity at site elevation will be less than this value.

2 Sulfur content of pipeline natural gas is 2 gr/100 scf as specified by PNM.

Criteria Pollutants

Emission Factors

	NOx	CO	SOx	PM	PM_{10}	$PM_{2.5}$	VOC
Boilers/ furnaces < 100 MMBtu-natural gas (lb/MMscf)	100	84	5.7	7.6	7.6	7.6	5.5

Notes

1 All Emission factors except SO_2 are from AP-42, Section 1.4, Natural Gas Combustion

2 SO_2 factor for natural gas = 2 grains S/100 scf or 20,000 grains S/MMscf x lb/7000 gr x 2 lb SO_2/lb S.

Maximum Uncontrolled Emissions - lb/hr

	NOx	CO	SOx	PM	PM_{10}	$PM_{2.5}$	VOC
Existing Boiler TA-50-2-BS-1	1.2	1.0	0.1	0.1	0.1	0.1	0.1
ENCON Thermal Evaporator	0.4	0.4	0.03	0.03	0.03	0.03	0.02
Total	1.7	1.4	0.1	0.1	0.1	0.1	0.1

Maximum Uncontrolled Emissions - ton/yr

	NOx	CO	SOx	PM	PM_{10}	$PM_{2.5}$	VOC
Existing Boiler TA-50-2-BS-1	5.4	4.5	0.3	0.4	0.4	0.4	0.3
ENCON Thermal Evaporator	1.9	1.6	0.1	0.1	0.1	0.1	0.1
Total	7.3	6.1	0.4	0.6	0.6	0.6	0.4

Total VOC Emissions - natural gas combustion plus process evaporation

	Evaporative Emissions		Evap + Combustion Emissions		
	Max Conc (ppm)	lb/hr	Total lb/hr	tpy	Total tpy
	5.46E-02	1.82E-04	2.44E-02	7.98E-04	1.07E-01

Notes

1 Evaporative VOC from maximum TTO (ppm) from 2007 RLWTF Annual Report.

Hazardous Air Pollutants

ENCON Thermal Evaporator - Combustion

HAP	Emission Factor lb/MMscf	Emission Estimate lb/hr	tpy
Organics			
POM	8.82E-05	3.89E-07	1.70E-06
Benzene	2.10E-03	9.26E-06	4.06E-05
Dichlorobenzene	1.20E-03	5.29E-06	2.32E-05
Formaldehyde	7.50E-02	3.31E-04	1.45E-03
Hexane	1.80E+00	7.94E-03	3.48E-02
Naphthalene	6.10E-04	2.69E-06	1.18E-05
Toluene	3.40E-03	1.50E-05	6.57E-05
Metals			
Arsenic	2.00E-04	8.82E-07	3.86E-06
Beryllium	1.20E-05	5.29E-08	2.32E-07
Cadmium	1.10E-03	4.85E-06	2.13E-05
Chromium	1.40E-03	6.18E-06	2.71E-05
Cobalt	8.40E-05	3.71E-07	1.62E-06
Lead	5.00E-04	2.21E-06	9.66E-06
Manganese	3.80E-04	1.68E-06	7.34E-06
Mercury	2.60E-04	1.15E-06	5.02E-06
Nickel	2.10E-03	9.26E-06	4.06E-05
Selenium	2.40E-05	1.06E-07	4.64E-07
	Total	8.33E-03	3.65E-02

Notes

1 All emission factors from AP-42, 7/98, Section 1.4-Natural Gas Combustion, Tables 1.4-2, 1.4-3, and 1.4-4.
2 Hourly values based on maximum hourly fuel capacity.
3 Annual ton/yr values based on operation of 8,760 hr/year

ENCON Thermal Evaporator - Evaporation Process

HAP		Max Conc (ppm)	lb/hr	tpy
	Arsenic	3.00E-02	1.00E-04	4.38E-04
	Beryllium	4.00E-03	1.33E-05	5.84E-05
	Cyanide	3.00E-03	1.00E-05	4.38E-05
	Lead	1.00E-02	3.34E-05	1.46E-04
	Mercury	1.10E-04	3.67E-07	1.61E-06
	Nickel	3.00E-02	1.00E-04	4.38E-04
	Phosporus	1.50E-01	5.00E-04	2.19E-03
	Selenium	2.20E-03	7.34E-06	3.21E-05
		Total	7.65E-04	3.35E-03

ENCON Thermal Evaporator - Combustion and Evaporation Total

	lb/hr	tpy
HAP	9.10E-03	3.98E-02

Toxic Air Pollutants

ENCON Thermal Evaporator

TAP		Combustion Emissions EF lb/MMscf	Combustion Emissions lb/hr	Evaporative Emissions Max Conc (ppm)	Evaporative Emissions lb/hr	Total lb/hr	TAP Threshold lb/hr
	Aluminum			5.40E-02	1.80E-04	1.80E-04	1.3E-01
	Ammonia			10.1	3.37E-02	3.37E-02	1.2E+00
	Barium	4.40E-03	1.94E-05	3.00E-03	1.00E-05	2.94E-05	3.3E-02
	Copper	8.50E-04	3.75E-06	2.30E-02	7.67E-05	8.05E-05	6.7E-02
	Fluoride			0.34	1.13E-03	1.13E-03	1.7E-01
	Nickel	2.10E-03	9.26E-06	3.00E-02	1.00E-04	1.09E-04	6.7E-02
	Selenium	2.40E-05	1.06E-07	2.20E-03	7.34E-06	7.45E-06	1.3E-02
	Silver			4.00E-03	1.33E-05	1.33E-05	6.7E-04
	Uranium			8.00E-03	2.67E-05	2.67E-05	1.3E-02

Notes

1 Evaporative emissions based on maximum concentration (ppm) from 2007 RLWTF Annual Report.
2 Evaporative emission (lb/hr) = max conc (ppm) x max flow rate (gal/hr) x 8.34 lb/gal (density water).
3 Combustion emission factors from AP-42, 7/98, Section 1.4-Natural Gas Combustion, Table 1.4-4.

Attachment 3

RLWTF Treated Effluent Annual Sample Results

Table 4-1
TA50 RLWTF Mineral Summary For 2007

	RAW Average	Maxi-mum	Mini-mum	Total In (Kg)	FINAL Average	Maxi-mum	Mini-mum	Total Out (Kg)
ALKALINITY-MO**	2.44E+02	9.35E+02	*	1.09E+03	2.23E+02	1.38E+03	2.60E+01	1.02E+03
ALKALINITY-P**	4.16E+00	5.40E+01	*	1.85E+01	8.51E+01	8.65E+02	*	3.90E+02
ALUMINUM	1.14E+00	8.30E+00	1.40E-01	5.08E+00	1.14E-02	5.40E-02	*	5.25E-02
AMMONIA-N	1.17E+01	1.85E+01	7.87E+00	5.18E+01	6.49E+00	1.01E+01	*	2.97E+01
ARSENIC	2.46E-03	3.00E-02	*	1.09E-02	4.24E-03	3.00E-02	*	1.95E-02
BARIUM	4.17E-02	1.00E-01	2.00E-02	1.85E-01	3.20E-04	3.00E-03	*	1.47E-03
BERYLLIUM	7.99E-03	3.00E-02	*	3.55E-02	4.52E-04	4.00E-03	*	2.07E-03
BORON	9.28E-02	2.00E-01	*	4.13E-01	1.07E-01	1.70E-01	7.00E-02	4.90E-01
CADMIUM	2.05E-03	1.00E-02	*	9.14E-03	*	*	*	*
CALCIUM	1.09E+01	1.90E+01	3.00E+00	4.86E+01	9.59E-01	3.95E+00	*	4.40E+00
CHLORIDE	1.37E+02	7.60E+02	1.92E+01	6.12E+02	7.52E+00	1.80E+01	3.20E+00	3.45E+01
COBALT	1.09E-02	7.00E-02	*	4.84E-02	*	*	*	*
COD	2.50E+02	5.54E+02	5.50E+01	1.11E+03	1.40E+01	6.20E+01	*	6.40E+01
CONDUCTIVITY**	1.44E+03	6.60E+03	2.90E+02	6.40E+03	2.65E+02	5.90E+02	1.20E+02	1.22E+03
COPPER	7.27E-01	2.50E+00	2.20E-01	3.23E+00	9.51E-03	2.30E-02	2.60E-03	4.36E-02
CYANIDE	8.21E-04	7.00E-03	*	3.65E-03	4.54E-04	3.00E-03	*	2.08E-03
FLUORIDE	8.55E-01	1.70E+00	4.00E-01	3.81E+00	1.33E-01	3.40E-01	*	6.09E-01
HARDNESS**	3.92E+01	7.22E+01	1.86E+01	1.75E+02	2.65E+00	9.86E+00	*	1.21E+01
IRON	3.66E+00	3.60E+01	4.90E-01	1.63E+01	1.82E-02	8.00E-02	*	8.36E-02
LEAD	1.99E-01	1.00E+00	6.00E-02	8.84E-01	1.13E-03	1.00E-02	*	5.18E-03
MAGNESIUM	2.90E+00	6.00E+00	1.40E+00	1.29E+01	6.12E-02	7.80E-01	*	2.81E-01
MERCURY	2.25E-03	4.60E-03	8.50E-04	1.00E-02	1.82E-05	1.10E-04	*	8.36E-05
NICKEL	6.11E+00	5.90E+01	5.00E-03	2.72E+01	5.16E-03	3.00E-02	*	2.37E-02
NITRATE-N	1.17E+01	2.40E+01	6.00E+00	5.22E+01	1.50E+00	6.50E+00	*	6.90E+00
NITRITE-N	1.10E+00	2.48E+00	*	4.91E+00	1.05E+00	2.44E+00	*	4.83E+00
PERCHLORATE	2.43E-01	5.00E-01	*	1.08E+00	*	*	*	*
pH	6.59E+00	1.19E+01	2.20E+00	—	7.47E+00	8.21E+00	6.72E+00	—
PHOSPHORUS	2.35E+00	3.40E+00	5.10E-01	1.05E+01	3.63E-02	1.50E-01	*	1.66E-01
POTASSIUM	2.07E+00	6.50E+00	2.00E-01	9.20E+00	7.19E-01	4.00E+00	5.00E-02	3.30E+00
SELENIUM	1.67E-03	5.20E-03	*	7.41E-03	1.04E-03	2.20E-03	4.20E-04	4.78E-03
SILICON	2.96E+01	4.10E+01	1.95E+01	1.32E+02	1.15E+00	3.39E+00	3.20E-01	5.29E+00
SILVER	3.04E-03	1.40E-02	*	1.35E-02	8.43E-04	4.00E-03	*	3.86E-03
SODIUM	1.48E+02	5.67E+02	1.40E+01	6.57E+02	4.17E+01	1.28E+02	1.00E+01	1.91E+02
SULFATE	2.96E+01	9.00E+01	1.13E+01	1.32E+02	5.81E+00	2.45E+01	2.60E-01	2.67E+01
TDS	5.28E+02	1.46E+03	1.96E+02	2.35E+03	9.84E+01	2.49E+02	2.20E+01	4.51E+02
TKN	1.61E+01	3.60E+01	*	7.16E+01	6.15E+00	8.80E+00	3.71E+00	2.82E+01
TOTAL CATIONS**	8.51E+00	2.70E+01	2.76E+00	3.78E+01	5.45E+00	2.96E+01	1.02E+00	2.50E+01
TOTAL CHROMIUM	2.19E-01	1.30E+00	1.00E-02	9.73E-01	*	*	*	*
TOXIC ORGANICS	n.m.	n.m.	n.m.	n.m.	9.07E-03	5.46E-02	*	4.16E-02
TSS	9.83E+00	5.60E+01	*	4.37E+01	1.82E+00	1.20E+01	*	8.36E+00
URANIUM	1.50E-01	3.30E-01	*	6.68E-01	1.23E-03	8.00E-03	*	5.62E-03
VANADIUM	2.13E-02	9.00E-02	*	9.49E-02	8.43E-04	8.00E-03	*	3.86E-03
ZINC	1.80E-01	9.00E-01	1.00E-03	8.02E-01	2.25E-03	1.00E-02	*	1.03E-02

Twelve influent samples and 12 effluent samples for each mineral.
* Less than Detection Limit n.m.: Not measured
**Units: All figures in mg/L except:
Alkalinities and hardness as mg CaCO3/L; Conductivity as uS/cm; Total Cations as meq/L.

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

New Mexico
ENVIRONMENT DEPARTMENT

Air Quality Bureau
1301 Siler Road, Building B
Santa Fe, NM 87507-3113
Phone (505) 476-4300
Fax (505) 476-4375
www.nmenv.state.nm.us

RON CURRY
Secretary

SARAH COTTRELL
Deputy Secretary

September 20, 2010

CERTIFIED MAIL NO. 7008 0500 0001 1250 1651

Patricia E. Gallagher
Los Alamos National Laboratory
Group Leader
Environmental Stewardship Department
PO Box 1663, MS J978
Los Alamos, NM 87545

No Permit Required (NPR)
No. 2195-U
Facility type: Thermal Evaporation Unit
IDEA ID No. 856 - PRN20100006
Los Alamos National Laboratory
AIRS No. 350280001

Dear Ms. Gallagher:

This letter acknowledges the receipt of your request for a permit applicability determination dated September 1, 2010 to construct and operate a natural gas-fired thermal evaporation unit for use in evaporating treated water from the existing LANL Radioactive Liquid Waste Treatment Facility (RLWTF) located within Technical Area (TA) – 50 at the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico. The request was received by the Department on September 3, 2010.

A review has been completed and the information provided is sufficient to complete an evaluation of your No Permit Required request. The results demonstrate that the emissions from the units are too low to trigger 20.2.72 NMAC - Construction Permits or 2.73 - Notice of Intent and Emissions Inventory Requirements. Therefore this notice of No Permit Required authorizes you to operate the facility as stated in the application.

This facility may be subject to state and federal regulations ***such as, but not limited to,*** those found in Table 1. It is the responsibility of the owner and/or operator of the facility to determine applicability and to comply with all existing, revised, and new applicable regulations.

Table 1: Regulations

Citation	Title
20.2.61 NMAC	Smoke and Visible Emissions

Please be advised that this No Permit Required determination was based upon the application submitted and these sources, when constructed, will be subject to inspection.

If you have any questions, please do not hesitate to contact me in Santa Fe at (505)476-5564.

Sincerely,

Norma Perez

Norma Perez
Minor Source Unit
Air Quality Bureau

cc via e-mail: Bill Blankenship/ bblankenship@lanl.gov
Enclosure: Industry/Consultant Feedback Questionnaire with envelope

: 12820

From:	Joni Arends
To:	jcds@lanl.gov; Pruett, Jennifer, NMENV; saladen@lanl.gov; adorries@lanl.gov; geneturner@nnsa.doe.gov; bbeers@lanl.gov; grieggst@lanl.gov; Huddleson, Steven, NMENV; Schoeppner, Jerry, NMENV; Jon Block; Hower, Jennifer, NMENV
Subject:	CCNS - Receipt of FOIA Request -- FOIA 14-00061-K
Date:	Monday, October 20, 2014 12:05:00 PM
Attachments:	FOIA 14-00061-K Arends Ack Ltr 12-11-13.pdf

Good morning,
At our October 15th meeting about the draft TA-50 GWDP, I stated CCNS's position that our written and oral comments about the draft GWDP are subject to change based upon receiving the documents requested on November 27, 2013 from DOE/NNSA under the Freedom of Information Act (FOIA) regarding the emissions from the SET and MES. Several people asked for the request. A pdf of the DOE/NNSA December 11, 2013 response is attached which lists the documents requested. [The DOE/NNSA FOIA website does not provide an electronic copy of the submission to the requester.] Below is the email correspondence with Karen Laney, with the DOE/NNSA OGC office in ABQ.

Please let me know if you have any comments or questions.
Best,
Joni

-------- Original Message --------
Subject: RE: Receipt of FOIA Request -- FOIA 14-00061-K
Date: Fri, 3 Oct 2014 14:49:12 -0600
From: Laney, Karen <Karen.Laney@nnsa.doe.gov>
To: Arends, Joni <Alert> <jarends@nuclearactive.org>
CC: Lewandowski, Sandra (CONTR) <Sandra.Lewandowski@NNSA.Doe.Gov>

Good afternoon, Ms. Arends.

We received 39 documents from the Los Alamos Field Office late yesterday afternoon that are responsive to your request. The documents need to be reviewed and redacted; we will not be able to complete the review/redaction by October 9, as I am out of the office for most of the next six weeks. Therefore, I have turned over your request to a colleague to process.

After my coworker has had a chance to review the file and responsive documents she will have a better idea of when you may expect a response. We beg your forbearance and appreciate your patience; we are working diligently to process requests as quickly as possible, but we have a significant backlog.

Best regards,

Karen Laney
Information Programs Specialist
Office of the General Counsel
National Nuclear Security Administration

PO Box 5400
Albuquerque, NM 87185

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From: Arends, Joni <Alert>
Sent: Tuesday, September 30, 2014 12:58 PM
To: Laney, Karen
Subject: RE: Receipt of FOIA Request -- FOIA 14-00061-K

Good afternoon Ms. Laney,

CCNS has not received a response to our FOIA 14-00061-K request despite assurances that we would. On October 1, 2013, you emailed me (see email below) that we would receive a response by May 31, 2014 - clearly beyond the 20 day FOIA requirement. Please advise about the status of our request.

CCNS, along with members of the Communities for Clean Water, will be meeting with the New Mexico Environment Department and DOE/LANS/LANL on Thursday, October 9, 2014. The information requested will be important to have for that meeting - and the DOE/LANL lawyers know it. Please advise at your earliest convenience. Thank you.

Best,
Joni Arends
CCNS

-------- Original Message --------
Subject:RE: Receipt of FOIA Request -- FOIA 14-00061-K
Date: Wed, 28 May 2014 15:31:34 -0600
From: Laney, Karen <Karen.Laney@nnsa.doe.gov>
To: Arends, Joni <Alert> <jarends@nuclearactive.org>

Good afternoon, Ms. Arends.

I've noted your address change in our database, thank you.

LAFO/LANL are working on clarifying and resolving questions about potentially responsive documents; they have not provided me with an expected completion date.

Best regards,

Karen Laney
Information Programs Specialist

Office of the General Counsel
National Nuclear Security Administration
PO Box 5400
Albuquerque, NM 87185

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From: Arends, Joni <Alert>
Sent: Wednesday, May 21, 2014 10:29 AM
To: Laney, Karen
Subject: Re: Receipt of FOIA Request -- FOIA 14-00061-K

Good morning,
Is there any word on a release date for the requested FOIA materials? Please note our new address. Thank you.
Joni Arends
CCNS
P. O. Box 31147
Santa Fe, NM 87594-1147
505 986-1973

On 5/9/14 7:02 AM, Laney, Karen wrote:
Good morning, Ms. Arends.

My point of contact at Los Alamos Field Office (LAFO) said that LANL initially sent records that were nonresponsive. They have that straightened out and I believe Lisa Cummings is reviewing records now. LAFO could not provide a date when I might expect them. I will contact you as soon as I have records ready to go.

Best regards,

Karen Laney
Information Programs Specialist
Office of the General Counsel
National Nuclear Security Administration
PO Box 5400
Albuquerque, NM 87185

-----Original Message-----
From: Arends, Joni <Alert>
Sent: Tuesday, May 06, 2014 11:37 AM
To: Laney, Karen
Subject: Re: Receipt of FOIA Request -- FOIA 14-00061-K

Good morning Ms. Laney,
I am checking on the status of our FOIA request. Do you anticipate providing the materials to us before or after the Memorial Day holiday? Thank you for your response.
Best,
Joni Arends, CCNS

On 1/13/14 9:48 AM, Joni Arends wrote:

Good morning,

Thank you for your response. I will look for the responsive documents in May 2014.

Best,

Joni Arends, CCNS

On 10.01.2014 09:20, Laney, Karen wrote:

Good morning, Ms. Arends.

I spoke with my FOIA point of contact at the Los Alamos Field Office. She talked with laboratory personnel who said that there are a voluminous number of potentially responsive documents to be reviewed by the laboratory and, in addition, it would take weeks to search for emails, which may also produce a significant number of documents. LANL expects to complete their search and review by the end of April 2014. Any responsive documents must then be reviewed by the field office before being forwarded to me. I do not anticipate receiving a response from the Field Office before the end of May 2014.

Best regards,

Karen Laney

Information Programs Specialist

Office of the General Counsel

National Nuclear Security Administration

PO Box 5400

Albuquerque, NM 87185-5400

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From: Arends, Joni <Alert>
Sent: Wednesday, January 08, 2014 2:59 PM
To: Laney, Karen
Subject: Re: Receipt of FOIA Request -- FOIA 14-00061-K

Good afternoon Ms. Laney,

Is there any movement on our FOIA request as referenced in the subject line above?

Best,

Joni Arends

CCNS

On 11.12.2013 13:07, Laney, Karen wrote:

Good afternoon, Ms. Arends.

The attached PDF acknowledges receipt of your request for records regarding the LANL Zero Liquid Discharge Solar Evaporation Tanks.

Best regards,

Karen Laney

Information Programs Specialist

Office of the General Counsel

National Nuclear Security Administration

PO Box 5400

Albuquerque, NM 87185-5400

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--
Joni Arends, Executive Director
Concerned Citizens for Nuclear Safety
107 Cienega Street
Santa Fe, NM 87501
505 986 1973
www.nuclearactive.org

From:	Huddleson, Steven, NMENV
To:	Beers, Bob; Pruett, Jennifer, NMENV
Cc:	Turner, Gene E; Trujillo, Eric L. (Eric.Trujillo@nnsa.doe.gov); Cummings, Lisa K; Del Signore, Chris; Saladen, Michael Thomas; McMichael, Susan Lynn; Dorries, Alison Marie; Grieggs, Tony; Schoeppner, Jerry, NMENV; Schwettmann, Bill; Sonnenberg, Leslie Keith; Bill C. Scott
Subject:	RE: DP-1132 list of remaining issues
Date:	Thursday, October 23, 2014 2:38:44 PM

Thanks Bob, I greatly appreciate your comment regarding our progress. I took a quick glance at the list and I agree, we are much, much, closer! I will pass these along to Jennifer Hower for her discussions with the attorneys but I am hopeful !

From: Beers, Bob [mailto:bbeers@lanl.gov]
Sent: Thursday, October 23, 2014 2:02 PM
To: Pruett, Jennifer, NMENV
Cc: Turner, Gene E; Trujillo, Eric L. (Eric.Trujillo@nnsa.doe.gov); Cummings, Lisa K; Del Signore, Chris; Saladen, Michael Thomas; Beers, Bob; McMichael, Susan Lynn; Dorries, Alison Marie; Grieggs, Tony; Schoeppner, Jerry, NMENV; Huddleson, Steven, NMENV; Schwettmann, Bill; Sonnenberg, Leslie Keith; Bill C. Scott
Subject: RE: DP-1132 list of remaining issues

Hi Jennifer,

Please find the attached list of remaining issues from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS). While some substantive issues remain the list is getting shorter! A testament to the last two years of earnest negotiations by NMED GWQB and DOE/LANS on this permit.

We look forward to our next meeting with you and your staff.

Sincerely,

Bob Beers
Los Alamos National Security, LLC
505-667-7969

From: Pruett, Jennifer, NMENV [mailto:Jennifer.Pruett@state.nm.us]
Sent: Friday, October 17, 2014 11:22 AM
To: Joni Arends (jarends@nuclearactive.org); Beers, Bob; Turner, Gene E
Cc: Huddleson, Steven, NMENV; Schoeppner, Jerry, NMENV
Subject: DP-1132 list of remaining issues

Good morning all,
At our meeting this week, I requested that both LANL/DOE and CCW provide me with a list of remaining issues on this permit, that I can combine and provide to NMED's attorney for discussion among the lawyers for all the parties. I believe I asked for this list by the end of next week, but neglected to mention that I will be on annual leave at the end of next week. In order to prevent this matter from languishing without attention while I am out of the office, please copy both Jerry and Steve with your lists; they will ensure the lists are appropriately compiled and delivered.

Thank you, and thank you for your continued discussions and information on this important permit.

Sincerely,
JJP

Jennifer J. Pruett
Manager, Pollution Prevention Section
Harold Runnels Bldg.
1190 St. Francis Dr.
P.O. Box 5469
Santa Fe, NM 87502-5469
505-827-0652

12829

Communities For Clean Water

October 24, 2014

Jennifer Pruett, Pollution Prevention Section Manager
Jerry Schoeppner, Bureau Chief
Steve Huddleson, Environmental Scientist
Ground Water Quality Bureau
New Mexico Environment Department
P. O. Box 5469
Santa Fe, NM 87502-5469

Re: Comments for September 22, 2014 New Mexico Environment Department draft Ground Water Discharge Permit for Technical Area 50 Radioactive Liquid Waste Treatment Facility at Los Alamos National Laboratory

Dear Ms. Pruett and Messr. Schoeppner and Huddleson:

The Communities for Clean Water (CCW), along with Independent Registered Geologist, Robert H. Gilkeson, and J. Gilbert Sanchez, with Tewa Environmental Watch Alliance, submit the following comments about the September 22, 2014 New Mexico Environment Department (NMED) draft Ground Water Discharge Permit for Technical Area 50 (TA-50) Radioactive Liquid Waste Treatment Facility (RLWTF) at Los Alamos National Laboratory (LANL). We appreciated the opportunities to discuss the issues with the parties on October 9th and October 15th, 2014.

CCW has carefully considered the items on the table. A number of these items below are not negotiable as we believe the underlying laws and regulations require these changes to assure adequate protection of the natural and human environment.

List of Remaining Issues

1. **Groundwater Monitoring** at VI.B.26 "Ground Water Flow," VI.B.27 "Ground Water Monitoring," VI.C.35 "Monitoring Well Location", VI.C.36 "Monitoring Well Construction," VI.C.37 "Ground Water Exceedance," and VI.D.44 "Post-Closure Ground Water Monitoring."

CCW appreciates that NMED is requiring the Permittees to install two new replacement alluvial wells for MCO-3 and MCO-7. The Permittees stated that CCW representatives would be provided the opportunity to witness the drilling of the wells. The Permittees stated that they would provide the necessary training, if necessary, for CCW representatives and would provide CCW with a letter stating their commitment to us. We have not received the letter.

We remain concerned that the replacement alluvial wells would be installed "at a location presumed to be hydrological downgradient of Outfall 051." We do not find such "presumed" language in the regulations.

We remain concerned about the use of the intermediate well MCOi6 for monitoring purposes. We suggest that a new intermediate well be installed at the location of MCOi6 and that after completion, both wells are sampled for eight consecutive quarters and the data compared.

We remain concerned about the use of the regional wells R-46 and R-60 for groundwater monitoring. We are concerned about the addition of regional wells R-1 and R-14. We refer NMED to the memos that have been submitted by Independent Registered Geologist Robert H. Gilkeson.

We remain concerned that the regional wells are "topographically downgradient of the RLWTF" – and not the Outfall 051. We do not find such language in the regulations.

We support the VI.B.27.j. NMED reporting requirements for the physical parameters of the water in the Permittee's report submitted to NMED.

2. **Closure and Post-Closure Plans.** CCW supports slowing the process down (two to three months) as mentioned at the October 15th negotiations to allow the Permittees to submit a more detailed closure plan and post-closure plan and for NMED to work on the plans so that it will be part of the permit when it is released for another round of public comment. This suggestion would comply with the New Mexico Water Quality Act and the Ground Water Quality Regulations.

Further, the closure plan does not meet New Mexico's regulatory requirements. The Ground Water Quality Regulations describes a closure plan as a plan that will "prevent the exceedance of standards of Section 20.6.2.3103 NMAC or the presence of a toxic pollutant in ground water after the cessation of operation." 20.6.2.3107.A(11). The regulation states that a closure plan includes, "a description of closure measures, maintenance and monitoring plans, post-closure maintenance and monitoring plans, financial assurance, and other measures necessary to prevent and/or abate such contamination." *Id.* Moreover, the description states that, "[t]he obligation to implement the closure plan as well as the requirements of the closure plan, if any is required, survives the termination or expiration of the permit." Id.

The "plan" that Permittees submitted for the Radioactive Liquid Waste Treatment Facility [RLWTF] that is the subject of DP-1132 in Appendix H to their application, is a mere outline that does not even address these requirements in any meaningful manner. In particular, it does not meet the following regulatory requirements in that it does not provide: (1) a description of closure measures that are specific to the RLWTF; (2) maintenance and monitoring plans; (3) post-closure maintenance and monitoring plans; (4) financial assurance; (5) any other measures necessary to prevent and/or abate contamination after cessation of operations. Merely stating that closure will be in compliance with state and federal regulations does not meet the New Mexico Ground Water Quality Regulations. *See* Id.

Further, the draft Ground Water Discharge Permit Renewal for the San Juan Generating Station Solid Waste Disposal Pit, DP-306, requires financial assurance because "ground water impacts have occurred in the shallow alluvial Shumway Arroyo aquifer due to the San Juan Generating Station operations." *See* Conditions 16 to 19.

CCW ask why NMED would hold the Permittees to a lesser degree of financial responsibility than the operators of the San Juan Generating Station when the potential long-term environmental damage due to releases from the RLWTF is as great or greater than that of the San Juan Generating Station? There needs to be adequate financial assurance to completely remediate the RLWTF just as there needs to be adequate closure and post closure plan in place to guide that process.

3. **VI.D.40 Cessation of Operation of Specific Units.** On October 9th we learned that LANL wants to retain the 75,000-gallon concrete influent storage tank as an emergency sump. It remains unclear about whether the tank is for transuranic (TRU) or low-level waste. Please see October 23, 2014 email from Joni Arends, CCNS about this matter.

If NMED approves the use of the tank as an emergency sump, CCW requests that NMED require the installation of slant wells beneath it in order to determine if it has leaked.

CCW support NMED's position for 60 days after the effective date of the discharge permit for cessation of operations.

4. **VI.D.41 Stabilization of Individual Units and Systems.** CCW supports NMED's changed for the submittal of the workplan from 120 days to 90 days.

CCW supports the NMED's position about the new characterization requirements at the second (a). CCW will provide comments about whether the investigation is from cessation or the start of closure after we see the next draft of the permit.

5. **Public Participation.** CCW supports the Permittees' proposal to establish a website/webpage for the TA-50 discharge permits (NMED and Environmental Protection Agency (EPA)).

CCW does not support the Permittees' proposal to limit the number of documents from 43 to 13. CCW argues that the Permittees' have created a friendly, easy to access website for the EPA Individual Stormwater Permit. We believe that the Permittees should be able to do the same for the TA-50 discharge permits.

In addition, CCW requests that the Permittees establish a quality assurance/quality control system for all docs submitted to the Electronic Public Reading Room in the interim, while the website is finalized.

6. **Contingency Plan.** We do not find the contingency plan in the draft permit.

7. **Emergency Plan.** CCW supports the requirement for an Emergency Plan in the discharge permit. Recent Defense Nuclear Facilities Safety Board Weekly Reports indicate that the Permittees are experiencing difficulties with their emergency preparedness. For example,

a. June 13, 2014 report. The Permittees conducted a nuclear criticality exercise at TA-55 on April 17, 2014 and noted four findings and seven opportunities for improvement, including that "operations in the Facility Incident Command (FIC) lacked formality, including personnel not following checklists, providing sporadic briefings, and confusion with seating and phones; at least 12 individuals walked past injured victims without offering assistance; and radcon technicians were not wearing proper personnel protective equipment (PPE)." http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Los%20Alamos%20National%20Laboratory/2014/wr_20140613_65.pdf

b. June 20, 2014 report. The Permittees conducted a functional exercise of the Emergency Operating Center (EOC) for a seismic event that resulted in the collapse of two nuclear facilities. During the initial critique "communications between the emergency directorate and support section personnel were identified." http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Los%20Alamos%20National%20Laboratory/2014/wr_20140613_65.pdf

c. August 15, 2014 report. The Permittees released their after-action report for the June EOC exercise. The report notes that "other notable opportunities for improvement include a field office identified issue to develop predetermined situational awareness information for display on the large electronic wall, the need for training on aspects of WebEOC, and the need to strengthen the conduct and physical arrangements for tabletop field play." http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20Reports/Los%20Alamos%20National%20Laboratory/2014/wr_20140815_65.pdf

Since the Cerro Grande fire in May 2000, CCW member groups have been following the emergency preparedness and response problems at LANL, especially for the nuclear facilities. The issues raised over a decade ago have not been resolved as witnessed by the latest DNFSB weekly reports. The RLWTF is a nuclear facility and as a matter of public safety, an emergency plan should be integral to the discharge permit. And as NMED staff has said, "The RLWTF is not like any other facility we regulate in New Mexico."

List of Remaining Issues
We are Waiting to Review NMED Language Changes

1. Definition of Secondary Containment. On October 15th, LANL raised concerns about the definition of "primary unit" in the first dot. Some of the secondary containment structures do not completely surround the "primary unit."

2. Condition VI.A.3 "Submittal of Plans and Specifications." The submittals should be placed in the EPRR. On October 15th, LANL argued about language in (k) and (m) about the "earliest practicable time" and asked for "in advance" language.

3. Condition VI.A.4 "Construction Report." On October 15th, the Permittees argued that there are many field changes and asked NMED if they wanted all of them. NMED suggested "significant field changes" language.

4. On October 15th, the Permittees raised concerns about the word "untreated" in VI.A.7 "Verification of Secondary Containment."

5. Water Tightness Testing at VI.A.8. The Permittees say they need 540 days (18 months) to test the units for water tightness.

6. NMED changed the language for exfiltration or infiltration rate from not exceeding 0.07 gallons per hour per thousand gallons of capacity to "as low as reasonably attainable for the unit or system" at VI.A.8 at p. 15. CCW supports the "number" of 0.07 gallons per hour per thousand gallons of capacity.

7. NMED deleted language of a rate of not to exceed 50 gal per mile per consecutive 24 hour period and reference to the manhole covers as a measure. CCW supports the "number" of 50 gallons per mile per consecutive 24 hour period.

8. Condition VI.A.9. Settled Solids and VI.C.30 Settled Solids Removal. CCW wants the settled solids removal and disposal plan now as part of the permit process – not 120 days after "the average settled solids accumulation in an open unit or system exceeds one foot." On October 15th, LANL wants the "average settled solids accumulation in an open unit or system exceeds one foot" language from Condition 30 inserted in Condition 9. CCW wants the plan to be submitted as part of the permitting process.

The Permittees said they wanted language in the second sentence in Condition 30 that says "Within at least 120 days prior to the determination ....

9. Condition VI.A.10 Facility Inspections. On October 15th, the Permittees had concerns about the use of the word "visual portions" of all synthetic liners in (b). NMED is going to add language for the visual portions above the water line.

10. Condition VI.A.13.b. Effluent Limits: Outfall 051. On Oct. 15th, the Permitees argued they want the same standards for the MES and the new RO treatment units. If approved, the language needs to be moved to Condition 14.

11. Condition VI.A.13.c. Effluent Limits: Outfall 051 – Table A-1 of NMED Risk Assessment Guidance for Site Investigation and Remediation (most recent edition). NMED only wants the reference to the most current version of the Table in the permit; LANL wants the entire Table A-1 in the permit.

12. Condition VI.A. 16 Installation of Flow Meters. There is a question about the need for 180 days to install the flow meters. There is one discharge pipe from TA-50 Bldg. 2 which splits and goes to the SET and Outfall 051. It will take about four to six months for LANL to install flow meters.

13. Conditions VI.A.16 and 17. The Permittees want 180 days to install and calibrate the flow meters.

14. Condition VI.B.23. Waste Tracking. On Oct. 15th, the Permitees argued that for the transuranic discharges they have the waste information, but for the low-level radioactive discharges, they don't. The Permittees should be keeping track of both.

15. Condition VI.B.25 Soil Moisture Monitoring System for the SET allows 120 days following the effective date of the DP to submit a workplan, design and schedule to NMED for approval for the installation of a moisture monitoring system.

16. Condition IV.B.24 Effluent Sampling. NMED identified whether the use of an in-house laboratory v. compliance sampling by an outside laboratory.

17. Condition VI.C.28. Containment. On October 15th, the Permittees requested language in (c) that says, ... the Permittees shall provide NMED oral notification of the release in accordance with 20.6.2.1203 NMAC ....

18. Condition VI.C.33 Effluent Exceedance. NMED "believes that cessation of discharge to DP-51 is not unreasonable given the potential to impact groundwater. Operation of RLWTF can continue by discharging to MES which is exempt from this requirement."

List of Remaining Issues
We are Waiting for a Response from the Permittees

1. We asked why the SET is "an unsealed subgrade concrete structure." See Condition V. On Oct. 9th, Eric Trujillo, DOE/NNSA, said he would get back to us about whether it is "unsealed.

CCNS reserves our right to change our position on any of the issues raised in the negotiations and this letter based upon receiving the 39 documents that are being processed by the Permittees for our Freedom of Information Act request, No. 14-00061-K, filed on November 27, 2013.

We look forward to next steps.

Sincerely,

Joni Arends
Concerned Citizens for Nuclear Safety
jarends@nuclearactive.org

Marian Naranjo
Honor Our Pueblo Existence
mariannaranjo@icloud.com

Brian Shields and Rachel Conn
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Kathy Sanchez and Beata Tsosie-Peña
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Robert H. Gilkeson
Independent Registered Geologist
rhgilkeson@aol.com

J. Gilbert Sanchez
Tewa Environmental Watch Alliance
tewacowboy@hotmail.com

cc: Jennifer Hower, Counsel for NMED
Jon Block, Counsel for CCW

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
PO Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666

National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87545
(505) 667-5794/Fax (505) 667-5948

Date: OCT 2 7 2014
Symbol: ENV-DO-14-0331
LAUR: 14-27799
Locates Action No.: N/A

Mr. Jerry Schoeppner, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Mr. Schoeppner:

Subject: Discharge Plan DP-1132 Quarterly Report, Third Quarter 2014, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the third quarter 2014 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the third quarter of 2014, no effluent was discharged to either the National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at Technical Area (TA)-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

<u>Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells</u>
Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial well MCO-7 during the third quarter of 2014. No samples were collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Detailed information on the condition of MCO-3 was submitted to the NMED in December 2013 (ENV-DO-13-0316). No samples were collected from alluvial wells MCO-4B and MCO-6 because there was insufficient water in the well for sampling. Samples from MCO-7 were submitted to GEL Laboratories LLC (GEL) for analysis.

All of the analytical results were below the New Mexico Water Quality Control Commission Regulation 3103 standards for nitrate-nitrogen (NO_3-N), fluoride (F), and total dissolved solids (TDS). Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the third quarter of 2014 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the third quarter of 2014 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:RSB/lm

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Hai Shen, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten Laskey, NA-LA, (E-File)
Carl A. Beard, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Randal S. Johnson, DSESH-TA55, (E-File)
Stephen G. Cossey, DSESH-TA55, (E-File)
Michael T. Saladen, ENV-CP, (E-File)
Robert S. Beers, ENV-CP, (E-File)
Robert C. Mason, TA55-DO, (E-File)
Leslie K. Sonnenberg, ADNHHO, (E-File)
John C. Del Signore, TA-55 RLW, (E-File)
LASOmailbox@nnsa.doe.gov, w/enc., (E-File)
locatesteam@lanl.gov, w/enc., (E-File)
env-correspondence@lanl.gov, (E-File)

Table 1.0. Mortandad Canyon Alluvial Well Sampling, 3rd Quarter, 2014.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B		Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-6		Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-7	F	7/17/2014	12.0	1.3	0.17	0.05	556	0.73
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

<u>Notes:</u>

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

[5]Dry means that there was insufficient water in the well for sampling.

From:	Purdy, Angeline (ENRD)
To:	"Jonathan Block"; Joni Arends
Cc:	Joseph Freedman; bscott@modrall.com; lisa.cummings@nnsa.doe.gov; smcmichael@lanl.gov; Hower, Jennifer, NMENV; Pruett, Jennifer, NMENV; Schoeppner, Jerry, NMENV; Huddleson, Steven, NMENV
Subject:	RE: Distributing LANL comments to CCW
Date:	Thursday, October 30, 2014 1:44:43 PM

Jon – neither DOE nor LANS objects to circulating the identified document to CCW member organizations.

From: Jonathan Block [mailto:jblock@nmelc.org]
Sent: Wednesday, October 29, 2014 4:42 PM
To: Joni Arends
Cc: Joseph Freedman; Purdy, Angeline (ENRD); bscott@modrall.com; lisa.cummings@nnsa.doe.gov; smcmichael@lanl.gov; Hower, Jennifer, NMENV; Pruett, Jennifer, NMENV; Schoeppner, Jerry, NMENV; Huddleson, Steven, NMENV
Subject: Distributing LANL comments to CCW

Hello, all:
Joni sent out the below. If we do not hear any objection by close of business tomorrow, we will send out the comments for the reasons indicated in her message.

Thanks for your cooperation.

Jon
On 10/28/2014 1:25 PM, Joni Arends wrote:

> Good afternoon,
> I am checking on the status of the Permittees comments that were submitted to NMED on Friday, October 24th. LA-UR-14-2826. Is it a public document that I may distribute to CCW member organizations? I am double-checking because it was prepared for discussions about the federal case.
>
> It would be helpful to share the document with CCW as we prepare for the next draft of the permit and the upcoming discussions. Thank you for your response.
> Best,
> Joni On 10/27/14 11:15 AM, Joni Arends wrote:
>
> > All,
> > Please find attached Revision 1 of CCW October 24, 2014 comments. We made a correction to the last paragraph. It now reads:
> >
> > CCW reserves our right to change our position on any of the issues raised in the negotiations and this letter based upon CCNS receiving the 39 documents that are being processed by the Permittees for its Freedom of Information Act request, No. 14-00061-K, filed on November 27, 2013.
> > Best,

Joni Arends, CCNS

On 10/25/14 7:26 AM, Jonathan Block wrote:

The LANS list etc for discussion Monday

Sent from my iPhone

Begin forwarded message:

From: "Hower, Jennifer, NMENV" <Jennifer.Hower@state.nm.us>
Date: October 24, 2014 at 4:38:02 PM MDT
To: Jonathan Block <jblock@nmelc.org>, "Purdy, Angeline (ENRD) (Angeline.Purdy@usdoj.gov)" <Angeline.Purdy@usdoj.gov>, "Bill C. Scott (bscott@modrall.com)" <bscott@modrall.com>, "Cummings, Lisa (Lisa.Cummings@nnsa.doe.gov)" <Lisa.Cummings@nnsa.doe.gov>, "smcmichael@lanl.gov" <smcmichael@lanl.gov>
Subject: RE: Monday U.S. v. Curry Attorney Meeting Update

See attached.

Have a good weekend,
Jennifer

Jennifer L. Hower
Deputy General Counsel
New Mexico Environment Department
5500 San Antonio Dr. NE
Albuquerque, NM 87109
Office: (505) 222-9550
Cell: (505) 500-7628
Fax: (505) 222-9510

From: Hower, Jennifer, NMENV
Sent: Friday, October 24, 2014 3:53 PM
To: 'Jonathan Block'; Purdy, Angeline (ENRD) (Angeline.Purdy@usdoj.gov); Bill C. Scott (bscott@modrall.com); Cummings, Lisa (Lisa.Cummings@nnsa.doe.gov);

smcmichael@lanl.gov
Subject: RE: Monday U.S. v. Curry Attorney Meeting Update

I have LANL/LANS list. NMED doesn't have a list, because our list is the cumulative list of the other parties issues (in other words, we're trying to figure out whether to accept/reject the outstanding suggested permit edits). Out of fairness, I'd like to send both the LANL and CCNS (CCW) list at the same time. It sounds like you all are almost done with your list, so you shouldn't have long to wait.

Jennifer L. Hower
Deputy General Counsel
New Mexico Environment Department
5500 San Antonio Dr. NE
Albuquerque, NM 87109
Office: (505) 222-9550
Cell: (505) 500-7628
Fax: (505) 222-9510

From: Jonathan Block [mailto:jblock@nmelc.org]

Sent: Friday, October 24, 2014 3:49 PM
To: Hower, Jennifer, NMENV; Purdy, Angeline (ENRD) (Angeline.Purdy@usdoj.gov); Bill C. Scott (bscott@modrall.com); Cummings, Lisa (Lisa.Cummings@nnsa.doe.gov); smcmichael@lanl.gov
Subject: Re: Monday U.S. v. Curry Attorney Meeting Update

Do you have the other lists? Please send those.

On 10/24/2014 3:46 PM, Hower, Jennifer, NMENV wrote:

> All-
>
> I promised I'd send the lists around that contain the outstanding issues related to the RLWTF discharge permit discussions. I'm still waiting on one of the lists, which is why you

haven't received anything yet. Clearly we won't be able to have a substantive discussion on the comments since you'll be receiving the lists so close to the meeting time (and that wasn't really my intent anyway). But, we should still be able to discuss forward progress and next steps, with hopefully an understanding of how many issues are left, and how substantive they are, assuming I'm able to send around the lists by 1 PM Mountain on Monday.

Have a good weekend,
Jennifer

Jennifer L. Hower
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Albuquerque, NM 87109
Office: (505) 222-9550
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12848

From:	Huddleson, Steven, NMENV
To:	Turner, Gene E.
Cc:	Pruett, Jennifer, NMENV; Cummings, Lisa; Saladen, Michael Thomas
Subject:	RE: Financial Assurance Question
Date:	Thursday, October 30, 2014 4:31:32 PM

Thanks Gene, the earlier the better so I can get this last version out to all the various groups.

From: Turner, Gene E. [mailto:Gene.Turner@nnsa.doe.gov]
Sent: Thursday, October 30, 2014 4:20 PM
To: Huddleson, Steven, NMENV
Cc: Pruett, Jennifer, NMENV; Cummings, Lisa; Saladen, Michael Thomas
Subject: RE: Financial Assurance Question

Steve-

I'd like to work with our legal staff on this; I'll try to get you a response early next week.

Regards,

GT

From: Huddleson, Steven, NMENV [mailto:Steven.Huddleson@state.nm.us]
Sent: Thursday, October 30, 2014 4:04 PM
To: Turner, Gene E.
Cc: Pruett, Jennifer, NMENV
Subject: Financial Assurance Question

Gene, in our last meeting with the respective groups, during the discussion of the applicability of Financial Assurance you spoke quite definitively that the attorneys had decided that it could/should not be applied to Federal agencies and LANL in particular. Could you provide a citation, reference, letter, memo or some kind of confirmation of that so we can resolve that issue satisfactorily? It would be most helpful... we hope to get the last Draft of the permit out to all tomorrow or early next week once I resolve a couple of issues (like this one).

Steve Huddleson, P.G., C.P.G.
Environmental Scientist
Groundwater Protection Bureau
New Mexico Environment Department
(505) 827-2936

From: Turner, Gene E.
To: Huddleson, Steven, NMENV; Pruett, Jennifer, NMENV
Cc: Saladen, Michael Thomas; "Beers, Bob"; Cummings, Lisa
Subject: Financial Assurance Issue
Date: Wednesday, November 12, 2014 2:52:42 PM
Attachments: Hearing Officer"s Report and draft Final Order.pdf

---

Steve/Jennifer-

As I indicated earlier, I consulted my legal staff regarding the Financial Assurance issue; see response below. The referenced Hearing Officer's report is attached, the Financial Assurance discussion begins on page 72.

Keep in mind that the facility will ultimately be closed under the RCRA Consent Order.

Regards,

GT

From: Cummings, Lisa
Sent: Wednesday, November 12, 2014 2:24 PM
To: Turner, Gene E.; 'McMichael, Susan Lynn'
Cc: 'Beers, Bob'; Saladen, Michael Thomas
Subject: FW: Preparation for Next Meetin

Gene –

Here is the rationale re: why a requirement for financial assurance should not be included in the RLWTF DP currently being negotiated:

The Water Quality Control Commission Regulations, at section 20.6.2.3107.A.ll NMAC, *authorizes* the Department to require financial assurance as a condition in a discharge permit – but it is *not* a requirement that all groundwater discharge permits include financial assurance requirements. Not all groundwater discharge permit contain such requirements, and, to my knowledge, none have been included in discharge permits issued at LANL. The purpose of requiring financial assurance is to ensure that sufficient funds will be available to implement closure plans or to conduct actions required by an abatement plan.

There is no need to impose financial assurance requirements on DOE/NNSA or LANS for the reasons that were discussed during the hearings on the recently-issued RCRA Permit. NMED included financial assurance requirements in the draft Permit, and we protested the requirement because there was no need to do so, and because there was an exemption for State and Federally-owned facilities. In the preamble to the promulgation of the financial assurance requirements, EPA stated that it provided the exemption because "government institutions are permanent and stable, and have as their reason for being the health and welfare of their people. Therefore ...publicly-owned facilities would be more likely and more able financially to carry out their closure and post-closure. " The Hearing Officer in the RCRA Permit decided that no financial assurance requirements should be imposed on LANS because "It is undisputed that, because LANS is a management and operating contractor, any financial assurance requirements imposed on LANS will be paid by the Federal Government and ultimately the United States taxpayer."

HWB regulations at 20.4.1.500 (adopting 40 CFR Part 264) provide that "States and the Federal government are exempt from the requirements of (financial assurance)," as do those of the Petroleum Storage Tank Bureau – its regulation provides that " federal government entities whose debts and liabilities are the debts and liabilities of a state or the United States are exempt from the requirements of this part." (20.5.9.900) The WQCCC has not adopted regulations detailing when and on whom financial assurance should be imposed, therefore there is no similar specific exemption in this case.

Lisa Cummings
Staff Attorney, DOE/NNSA, Los Alamos Site Office
(505)665-9172(work)
(505)699-1590 (personal cell)

:12853

12854

Page #	Description	Remaining Issue: October 31, 2014 Revised Draft Permit DP-1132
6	Definitions: Secondary Containment	Definition of secondary containment does not define *"primary unit." "Primary unit"* is not used in Condition No. 7, *Verification of Secondary Containment.* DOE/LANS recommend deleting the word *"primary."*
11	Posting to EPRR	The revised draft permit lists 43 required postings to the EPRR which are scattered throughout the permit. In the December 2013 PN2 comments submitted to NMED, DOE/LANS proposed a new condition, *Public Involvement*, that commits to 13 postings and removes any penalties or enforcement related to such posting requirements. DOE/LANS recommend adoption of the proposed condition, "*Public Involvement*", submitted to NMED on December 12, 2013.
15	No. 8 Tightness Testing	Condition No. 8 is acceptable with the exception of the following: • The change in testing frequency from every 540 days to every 180 days. DOE/LANS propose the reinstatement of the previous testing frequency of every 540 days.
20 and 21	No. 13 Effluent Limits	DOE/LANS propose the following change to the compliance schedules in Condition Nos. 13b and 13d: • From "*September 30, 2015"* to *"September 30, 2016*"
21	No. 13 Effluent Limits: MES & SET	Interim effluent limits were reinstated to Condition No. 13, *Effluent Limits: MES and SET*, but incorrectly. Correct interim limits should read: *Until LANL is operating new reverse osmosis treatment units, but no later than September 30, ~~2015~~ 2016, the following alternative effluent quality limits for ~~Total Nitrogen~~ NO3-N shall apply for discharges to Outfall 051:* • *Daily Maximum:* *~~45~~ 30 mg/L* • *Quarterly average:* *~~15~~ 10 mg/L*
22	No. 15 Emergency Plan	The Emergency Plan is redundant because requirements a. – f. are satisfied by the following: • Contingency Plans: No. 29, *Containment*; No. 30, *Water-Tightness;* No. 32, *Damage to Structural Integrity*; No. 34, *Effluent Exceedance*; No. 35, *Soil Moisture Detection System Exceedance*; No. 38, *Ground Water Exceedance*, and No. 39, *Spill or Unauthorized Release.* • LANL's Emergency Operations Center, Incident Command System DOE/LANS propose adoption of the revised Condition No. 15, *Emergency Response Procedures,* submitted to NMED on June 30, 2014.

Page #	Description	Remaining Issue: October 31, 2014 Revised Draft Permit DP-1132
26	No. 23 Waste Tracking	The Waste Tracking condition is unacceptable due to the following requirement: 1. *"The Permittees shall maintain written or electronic records of all wastestreams conveyed to or from the Facility"* This requirement subjects all non-liquid waste removed *"from"* the facility to regulation by the discharge permit. The disposition of non-liquid waste from the RLWTF is outside the jurisdiction of the New Mexico Water Quality Act. The disposal of radioactive non-liquid waste is regulated by the U.S. Department of Energy DOE/LANS request the removal of "*....or from*".
29	No. 27 GW Monitoring	60 days to submit a workplan for the installation of two replacement monitoring wells in Mortandad Canyon is not sufficient time. DOE/LANS request 90 days to submit the required workplan.
42	No. 42 Stabilization of Units	The requirement to identify in a workplan *"characterization activities to be taken"* during the stabilization of units does not recognize the March 1, 2005, Compliance Order on Consent as the sole authority for environmental characterization, investigation, and clean up at LANL. DOE/LANS request that this condition state that LANL will undertake characterization activities as set forth in the March 1, 2005, Compliance Order on Consent.
43	No. 43 Closure Plan	The current Closure Plan is unacceptable to DOE/LANS.

	PgNo	Description	Remaining Issues
1	6	§II.W. Secondary Containment	Before the pipeline between the RLWTF and the SET is operated, the pipeline must have secondary containment.
2	10	§V. Description of SET	We still don't know if the SET is an "**unsealed** subgrade concrete structure with a single double-lined synthetic liner, and a leak detection system within the synthetic liner." At the 10/9/14 meeting, NNSA staff said they would get back to us on this issue. We have not received that information. If it is unsealed, we need to know how the thickness of the concrete structure. It would be helpful to have an engineering diagram of the concrete structure, as well as the leak detection system.
3	11	§1. Annual Update - Posting to EPRR	Posting to the Electronic Public Reading Room (EPRR) must be enforceable. We suggest a stepwise approach. If a document is found to not be posted, the Permittees have 14 days to post it to the EPRR. If it is not posted within that time frame, then it shall be enforceable under NMAC 20.6.2.1220. Below is the language from the 2010 HazWaste Permit, which may be helpful to include in the permit: **1.13 PUBLIC NOTIFICATION VIA ELECTRONIC MAIL (E-MAIL)** The Permittees shall notify individuals by e-mail of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested e-mail notification and send such notices to persons on that list. The notice shall be sent within seven days of the submittal date and shall include a direct link to the specific document to which it relates. The Permittees shall provide a link on the internet on the Permittees' environmental home page (http://www.lanl.gov/environment) whereby members of the public may submit a request to be placed on the e-mail notification list. In the event that the environmental home page stops operation, the Permittees shall use their best efforts to fully restore the page and its operation as soon as possible. *** Where a Permittee submittal and NMED response is required to be posted to the EPRR, the language needs to be clarified so that it is clear that the Permitees must post the submittal when it is submitted to NMED. We are concerned that the language could be interpreted to read that the Permittees may post their submittal when they receive NMED's response. For example, §12

			Freeboard.
4	11	§1. Website	CCW accepts the Permittees' proposal to establish a website six months from the effective date of the permit. A wonderful example is the Permittee's Stormwater website at: http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/index.php
5	14	§5. Restricting Entry	We are concerned that Permittees cannot restrict entry into the area around the Outfall 051.
6	15	§6. Signs	Did NMED conduct government-to-government consultation with the Tribes about the signage? Signs are only required to be in English and Spanish. The requirement should include a requirement for a visual sign – one without words. Below is language from 2010 HazWaste Permit, which may be helpful in the discussions: 2.5.1 Warning Signs The Permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the permitted units (see 40 CFR § 264.14(c)). Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. The Permittees shall include on the signs the following or an equivalent warning: DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS) The Permittees shall post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility's permitted units and the Pueblo of San Ildefonso (PO WHO GEH). The Permittees shall post signs requested by Santa Clara Pueblo (Kha-'Po). The Permittees shall include on the signs the following warning: Wi-i ts'uni pi' – (DO NOT ENTER)
7	15	§7. Verification of Secondary Containment	Permittees must verify that systems and units that carry **untreated** liquid or semi-liquid waste streams meet requirements for secondary containment in §8 below. Permit gives LANL 180 days to verify. The permit should require verification within 30 days of the effective date of the permit. Are the Permittees verifying secondary containment now?
8	15	§8. Water Tightness	Testing for water tightness should begin within 30 days of the effective date of the permit. Are

		Testing	the Permittees testing for water tightness now?
9	23	§17. Calibration of Flow Meters	LANL has stated that is should not be held to flow meter accuracy greater than +/- 10%. However, "ISO 17025-certified meters can achieve +/- 0.05 percent accuracy." Moreover, modern flow meters--of the type one would expect to be used at an advanced laboratory such as LANL-- are even more accurate. "[M]easuring uncertainties of +/- 0.1% of rate are achievable with modern flowmeters." Jerry Stevens & Jason Pennington, "Flowmeter Calibration, Proving, & Verification Ensuring the accuracy & repeatability of your flow measurements (September 26, 2010). Online at: http://www.flowcontrolnetwork.com/articles/calibration-proving-verification Additionally, it is important to note that the ISO/TEC 17025 General Requirements are the doormat for competent testing and calibration laboratories, so one would expect that LANL observes these standards in calibration and measurement. The standard is described as follows: ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories is the main ISO standard used by testing and calibration laboratories. In most major countries, ISO/IEC 17025 is the standard for which most labs must hold accreditation in order to be deemed technically competent. In many cases, suppliers and regulatory authorities will not accept test or calibration results from a lab that is not accredited. Originally known as ISO/IEC Guide 25, ISO/IEC 17025 was initially issued by the International Organization for Standardization in 1999. There are many commonalities with the ISO 9000 standard, but ISO/IEC 17025 is more specific in requirements for competence. And it applies directly to those organizations that produce testing and calibration results. Since its initial release, a second release was made in 2005 after it was agreed that it needed to have its quality system words more closely aligned with the 2000 version of ISO 9001. The standard was first published in 1999 and on 12 May 2005 the alignment work of the ISO/CASCO committee responsible for it was completed with the issuance of the reviewed standard. The most significant changes introduced greater emphasis on the responsibilities of senior management, and explicit requirements for continual improvement of the management system itself, and

			particularly, communication with the customer. The ISO/IEC 17025 standard itself comprises five elements that are Scope, Normative References, Terms and Definitions, Management Requirements and Technical Requirements. The two main sections in ISO/IEC 17025 are Management Requirements and Technical Requirements. Management requirements are primarily related to the operation and effectiveness of the quality management system within the laboratory. Technical requirements include factors which determines the correctness and reliability of the tests and calibrations performed in laboratory. Laboratories use ISO/IEC 17025 to implement a quality system aimed at improving their ability to consistently produce valid results. It is also the basis for accreditation from an accreditation body. Since the standard is about competence, accreditation is simply formal recognition of a demonstration of that competence. A prerequisite for a laboratory to become accredited is to have a documented quality management system. The usual contents of the quality manual follow the outline of the ISO/IEC 17025 standard. On line at: http://en.wikipedia.org/wiki/ISO/IEC_17025 (emphasis added).
10	26	§22. Discharge Volumes	Flow meters don't have to be installed until 180 days after the effective date of the permit. How will the discharge volumes be determined in the interim? Is there a flow meter on the discharge pipe that leaves TA-50, Bldg. 2 that splits to go to the Outfall and SET?
11	26	§23 (b). Waste Tracking	The permit must require waste tracking for both conveyance and discharge of TRU and LLW waste streams. These numbers may be helpful if there is a problem with either conveyance or discharge. Also, see comments to §31 below about Settled Solids Removal.
12	27	§25. Soil Moisture Monitoring System for SET	It is not clear whether Permittees will be permitted to discharge to SET before the baseline conditions are established. Within 120 days following effective date of DP, Permittees are required to submit a workplan for the moisture monitoring system with neutron moisture probes.

			After the effective date of the permit, it is foreseeable that a year could go befor the installation of the soil moisture monitoring system. The baseline must be established before discharges to the SET begin. We suggest an interim system should be in place before discharge so that a baseline may be promptly established. We need baseline numbers before operations.
13	29	§26, et al., Groundwater Provisions.	Permittees agreed to provide CCW, Gilkeson & Sanchez with letter confirming commitment to allowing us to witness drilling of new alluvial wells. We have not received it. We appreciate that NMED is requiring replacement of two alluvial wells. We remain concerned about the use MCOI-6 and the regional wells for ground water monitoring purposes. They should also be replaced. We reference the detailed comments of Robert H. Gilkeson, found in Appendix A, "Deficiencies in Ground Water Protection in the Draft Ground Water DP-1132 Permit, by Independent Registered Geologist Robert H. Gilkeson," to the CCW, Gilkeson and Sanchez December 12, 2013 comments for the DP-1132 draft permit. Gilkeson has provided detailed comments about why MCOI-6 and the regional wells need to be replaced. In addition, NMED has stated that the wells "were not installed for contaminant detection or groundwater monitoring." We quote from page 31 in the NMED November 2010 General Response to Comments on the LANL RCRA Renewal Permit: "The NAS report [National Academy of Sciences 2007 Final Report] references wells that were installed as part of LANL's groundwater characterization efforts that wer conducted in accordance with their Hydrogeologic Work Plan (1998)…. These [characterization] wells were not installed for contaminant detection or groundwater monitoring. Therefore, these wells have limited relevance to groundwater protection goals set forth by the March 1, 2005 Consent Order."
14	34	§31. Settled Solids Removal	We are concerned that there is no public participation requirement for the submittal of the settled solids removal workplan. Because the RLWTF is unlike any other facility in NM, we urge NMED to require the workplan now to be part of the permit that is released for public comment. Additionally, reporting on the nature and amount of solids, timing of disposal at WIPP should be a matter of course, as LANL's "Supplemental Information for Discharge Permit Application DP-

			1132, Radioactive Liquid Waste Treatment Facility (RLWTF) and Zero Liquid Discharge (ZLD) Solar Evaporation Tanks," ENV-RCRA-12-0173, LAUR-12-21591 (August 10, 2012, as revised) ("Supplement") states at A-8, page 1: "(2) Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Project as a solid transuranic waste." It is, thus, clear that LANL has records of settled solid accumulation and removal which could be share with the public. Additionally, it is clear that these records include the volumes of material being accumulated and processed, which means LANL also can provide this information. In fact, the Supplement goes on to state at B-12, page 2: "Transuranic influent is received in batches from TA-55, with influent collected in either the acid tank or caustic tank in Building 50-66. Level probes for these tanks are linked electronically to the RLWTF control room. Operators monitor and record tank level changes during each influent batch transfer. Influent volumes are calculated from the difference between beginning and ending tank levels." Similar data collection applies separately to Low Level Waste, as the Supplement states further that: "Low-level RLW influent volumes will be determined by monitoring and recording the change in level of Tank 5 and Tank 6 in the Waste Management and Risk Management (WMRM) Facility. While radioactive liquid waste (RLW) is being fed to the treatment process from one of these two influent tanks (e.g. Tank 5), the fresh influent will be received in the other influent tank (e.g. Tank 6). In this illustration, the change in the level of Tank 6 from one day to the next will reflect the volume of the influent received." *Id.* It is difficult to imagine that given LANL keeping such records of the influent, they are failing to do so for the treated effluent Low-level RLW. Thus, it is reasonable for LANL to make the input-output date for both Low-level RLW and Transuranic RLW and solidified material available to the NMED and the public.
15	41	§41. Cessation of Operation of Specific Units	We support retention of 75,000 gallon concrete influent storage tank for emergency storage for LLW liquid waste. Should this specific condition be moved to another section, or have its own condition?
16	42	§42. Closure Plan	The draft permit that is released for public comment must include the Closure Plan. There is no schedule for closure.

17		Financial Assurance	CCW, et al., request financial assurance be required in the GWDP.
18	47	§52. Extensions of Time	The Permittees submittal must be posted to the EPRR. The NMED response must be posted to the EPRR.
19			CCW, et al., reserve the right to object or comment on issues raised or identified by CCW, et al.
20			CCNS received the DOE/LANL response to its November 2013 FOIA request. We are reviewing the documents and may have additional comments as a result. Did the Permittees calculate emissions to the air from the MES and SET for constituents other than the radionuclides? If so, please provide to us.

11/17/14 CCW-LANS/DOE-NMED meeting

Jennifer Pruett	NMED	Jennifer.Pruett@state.nm.us
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Steve Huddleson	NMED	Steven.Huddleson@state.nm.us
BRIAN SHIELDS	Amigos Bravos	BSHIELDS@AMIGOSBRAVOS.ORG

Joni - phone
Bob Gilkeson - phone

<u>DP-1132 LANL/CCW Meeting November 17, 2014</u>

Start: 9:00 a.m.

<u>Introductions:</u>

JJP
Steve Huddleson
Chris Del Signore
Mike Saladen, LANS
Alison Dorries, LANS
Gene Turner, DOE
Bob Beers, LANS
Eric Trujillo, LANS
Joni Arends, CCNS (by telephone)
Brian Schields
Kathy Wanpovi-Sanchez, CCW, Tewa Women United

Joni wants to take a recess to call Jon Block and clarify matters with Jon Block because she thinks there is a conflict of interest regarding the purpose of the meeting. Joni says they have a misunderstanding about the lawyers involvement in these meetings and the federal case, but as the parties are present, CCW will negotiate in good faith and continue with the meeting.

Bob did not receive CCW's list of issues, and had no time to receive.

<u>Discussion Topics</u>

Additional discussion items: LANS/DOE

1.Definition of 2nd containment: what is primary unit? Not used in the permit, the permit just refers to "units". Steve will look at that.

2.EPRR: 43 required postings. LANS submitted a new condition in 12/12/13 comments, would like that revised condition be incorporated into the permit. LANS will set up EPRR and put 13 submittals in voluntarily, not as a permit condition. Last time Rachel noted stormwater process for posting, Mike says this is similar to that IP process. Proposal is very similar to the NPDES IP process. Brian says they also brought up language similar to the Haz Waste Program/RCRA process.

Brian wants LANS to provide some accountability for LANL to post things, other than voluntarily.

Steve has attempted to come up with compromise language, still no group agreement.

3.Tightness testing (Condition #8) revised draft changed implementing time for initial testing from 540 days to 180 days from issuance of permit, which LANL will accept. Re-testing should be 540 days (every 18 months?), not 180 days, every 6 months (which is unreasonable).

Joni: are the permittees doing water tightness testing now?

Chris: no.

Joni: they are going to have to talk about that. They are concerned about a lack of testing for systems that don't have 2nd containment. Pipe between RLWTF and

SET needs to be replaced so that it has 2nd containment, and then the only pipeline that would require tightness testing would be Outfall 051. Joni is concerned that SET pipeline was installed in 2010 without 2nd containment.

4. **Condition 13 Effluent limits**. LANL requested change in compliance schedule from 9/30/15 to 9/30/16 but they are behind schedule and want another year to install. The equipment is on site, will occupy 2 rooms – first the equipment in those rooms must be removed, rooms will be gutted, then connecting piping will tie in new equipment. Then enter DOE's start-up process of testing with non-rad water, do management self-assessment (training, review of SOPs, witnesses of operation, then correct any findings, only after all that can operate).

CCW wants to know if LANL will compromise on something else if CCW agrees to this longer period of time.

5. **Condition 13 for effluent limits for SET and MES**. Several errors – limits are for nitrate as nitrogen. Limits in 10/31/14 proposal should be more stringent.

6. **Condition 15 Emergency plan** – LANL submitted a proposed plan 6/30/14, proposed language 9/10/13 and would like that plan to be inserted into the draft permit. Bob says LANL has a very robust Emergency Operations Center constructed after fires, with trained HAZMAT teams. Contingency plan in draft permit has 5 emergency notifications required to NMED. LANL already has the 6 items listed in the draft permit, so proposed different language.

Steve will review the draft language and will consider revisions, put it back in to address CCW's concerns about emergency plan. Steve will tour EOC, asked if CCW can visit also; LANL will consider.

7. **Waste tracking Condition 23**: LANL is very concerned about having to track all liquid and non-liquid waste leaving the facility, as Chris has listed at least 10 so this would be an extensive list. The word "all" covers domestic waste from toilets that shouldn't be part of this permit. Could add "radioactive" to cover concerns to DP?

Chris: why should municipal solid waste be covered in this permit? Would be covered in broad language. Bottoms should be covered, sludge, and rad waste should be covered.

Steve asked for 10 waste stream items, which would be helpful.

8. **Condition 27: GW Monitoring** requirement for workplan to replace the 2 MWs in Mortandad Canyon – 60 days isn't enough time to put together and get all approvals, so they request 90 days.

9. Condition 42 Stabilization of Units. LANL argues that this goes beyond stabilization and into RCRA characterization and closure requirements.

JP explained that this is GWQB's authority to ensure that nothing is present that could directly or indirectly affect GW in the future until the facility and unit are completely fully closed, which could be decades. This will not be a full RCRA characterization, but will be accomplished in a workplan as GWQB frequently does, to ensure there will not be any future impacts on GW quality.

10. **Condition 32 Closure Plan**. LANL is not clear what GWQB means by "detailed Closure Plan" – how much detailed description is required?

Steve: detailed means comprehensive description of how each required activity is to be accomplished. Detail means that when Steve reads what LANL is going to do, he can visualize it.

Chris: "Detailed" doesn't mean listing every valve.

Bob: why is there no reference to the Consent Order because this is the sole authority for clean up at LANL.

Steve: Our understanding is that the Consent Order is a separate matter but GWQB wants to ensure with this provision that stabilization and some characterization is not completely delayed until final closure of the facility, to ensure GW quality is not degraded during the interim.

JP: Ask the lawyers if this can be added as a reference, and to distinguish between GWQB's interim stabilization measures to protect GW and final RCRA closure.

Additional discussion items: CCW

1.Secondary containment definition: CCW wants 2nd containment on the SET pipeline.

2.V Description of SET. SET is un-sealed. CCW requests diagram and technical information on the SET itself, leak detection. Wants to know thickness of the entire facility, leak detection system.

Bob says these were submitted on CD or memory stick; Steve will look for all engineering documents and provide them to CCW. Moisture probes will be submitted as separate document workplan, required to be submitted after permit approval.

3.Condition 1 Annual Update. CCW has concerns about how LANL operates. CCW believes the public is helpful if notified of matters and waste streams, can provide input to improve things. Therefore CCW is requesting EPRR which must be an enforceable part of the DP. NMED must provide a way for the public to have access to as much documentation as possible.

4.Condition 1 Website. CCW wants LANL to establish a webpage within 6 months from effective date of the permit.

5.Condition 5 Restricting Entry. Entry into area of Outfall 051 isn't restricted, and CCW is concerned that this can't be made secure.

6.Condition 6 Signs. Kathy wants postings in TEWA and visual signs (rather than written words), not just in one place.

Chris: the public can't get to this facility without going into 2 security gates without escorts. He thinks the signs are pointless but could also be in Tewa.

Steve asked Kathy to provide some examples of requested visual signs.

7.Condition 17 Verification of 2nd Containment.

Chris: yes, they are verifying 2nd containment now, with checks and alarms.

8.Condition 8 Water Tightness Testing.

Chris: they are not doing this testing now on the line to the outfall; they did do it when installed the line to the SET.

9.Condition 17 Calibration of Flow Meters. CCW has found meters that can be calibrated to 0.05% plus/minus, and thinks this facility should be required to have these. CCW wants more accurate flow meters, and GWQB should require this international standard.

10. **Discharge volumes Condition 22**. If flow meters don't have to be installed until 180 days after effective date, how is discharge volume determined now?

Chris: currently they have flow meter that feeds evaporator (MES) that they measure; no other discharge is being used. Until flow meter installed on SET line, they would use measurement probes on the tanks themselves, based on drawdown within tanks.

Joni: there should be language in the permit that addresses that.

Bob pointed to language in Conditions 21 and 22.

11. **Waste Tracking Condition 23**. CCW thinks was should be tracked both coming in and going out. They would like to understand how TRU waste is batched, stored, treated and discharged.

Chris says they can track the TRU waste in and out (not that frequent, and not released to the environment), but can't track the low-level waste that comes in like to a sewer plant.

Joni is concerned about both. Would like some language in the draft about conveyance of waste and tracking it.

JP asked Joni to provide language for review of what she wants.

12. **Condition 24 Soil Moisture Monitoring System for SET**. CCW is concerned that the baseline will be established after the facility receives liquid waste; wants baseline established prior to discharges beginning.

13. **Conditions 26 et al GW Provisions.** Remain concerned about MCOI-6 and want regional wells replaced. See Gilkeson's comments. They believe that NMED must require that all wells for GW monitoring in this permit must be replaced.

Additionally, permittees agreed to provide CCW with a letter allowing CCW to be present when new wells are drilled, and they haven't gotten this letter.

Allison said they will not write the letter until they have a permit and they know when the wells will be drilled.

Joni is very concerned because at first meeting, Allison agreed and didn't put any conditions. They wonder if Allison is negotiating in good faith. CCW wants their experts to be able to come also. Steve assures that no particular training will be required.

14. **Condition 31 Settled Solids**. Workplan should be in DP, or no public review process. This is similar to the Closure Plan issue. CCW wants to understand this plan as part of the permit process, and wants LANL to share information on sludge and settled solid accumulation and removal.

Bob thought this paragraph applied to the SET, concerns about accumulation of solids that would accumulate in the SET, not to solids that accumulate in the influent and treatment process.

Steve: defined as solids from evaporation units (SET and MES). ***Steve will include clarifying language.***

Chris: periodically drain the MES back into the facility and re-treat it, so there are no settled solids from the MES.

15.**Condition 41 Cessation of Units**. Should there be a separate section for the influent tank (75,000 gallons)? There could be confusion because it is going to cease operation but still be available for emergency use. Maybe reflect this in the Authorization paragraph – can't be used for storage of influent but only for emergency storage. ***Steve will review this language***.

16.**Closure Plan Condition 42-43**. Brian is concerned that we need this Plan now because we need to know what the cleanup is going to be, even if it happens in the future. As units are added and closed, closure needs to be part of the permit. They have a real problem with the permit requiring closure, but not having the closure requirements in it. They will pursue including this into the permit. Currently DP allows 180 days for closure plan; they don't see why the Secretary couldn't require this right now. It doesn't serve us to bifurcate the process, requires 2 different public inputs and public review processes, which is incredibly burdensome, so closure needs to be part of the permit.

17.**Financial Assurance**. CCW wants FA based on the Closure Plan requirements. This is important for future generations, is the prudent thing to do.

18.**Extensions of Time Condition 52**. These should be included in the EPRR, with NMED responses also included LANL can't delay posting the request for extension until receive NMED response. LANL can't delay posting quarterly reports until receiving NMED comments/approvals. Under other permits, LANL posts **"within a reasonable period of time"** and NMED responds within 30-60 days. During that time before NMED's response, public can submit comments. CCW wants LANL to also be required to post NMED's response. Joni provided clarifying language from the Haz Waste permit; wants this language added to every place in the DP that LANL is required to add things to EPRR.

19.**&20**: CCW might still have some additional items/comments. Did LANL do any other calculations on air emissions other than radionuclides, for other constituents? LANL said they would review and look for this.

JP: parties at the meeting may have 2 weeks (Wednesday December 3) to send in comments based on what they heard today, provide additional suggested language. In the meantime, GWQB will work with lawyers to set up legal discussion of remaining issues.

Steve will send info on SET, Emergency Plan and EOC provided in hard copies today.

Meeting

JA. - conflict of interest regarding Federal Case and this DP in reverting to attorneys - not a place where attorneys involved in Federal case can speak for other parties -
- breaking off to call Jon Block

mis understanding of role of lawyers -

BB - LANs
- 43 required posting to public reading room - LANs submitted public involvement, LANs commits to posting 13 submittals -
- similar to IP process on stormwater
object to the 43 separate submittals
- B.S. - hazardous waste program language

CCW Tightness testing if below SET needs

Equipment is onsite -
Will go to 24 and 36 - equipment
in those rooms will be de-com -
need to re-pipe re-engineer then
move equip → testing process/requires
testing w/ non-rad detailed requirements
of 4-7 people observing and findings -
readiness testing -
-allow discussion -

~~Waste track~~
Emergency Plan - Submitted June
2014 to J.S. proposed emergency
plan -
RLWTF has emergency response
procedure that addresses many
of the

16 a - in place
dedicated emergency response Center -
Draft permit contingency plan has
5 requirements for notification
16 b - have
c - EOC does this
e - EOC has this for Lab

Waste tracking
concerned about requirement of waste
tracking - >10 Waste Streams

Stabilization of unit - now includes characterization -
J.P. - due to delays in de-com our intent to determine no potent. impacts to groundwater, - long term operation of facility leads to concern

Closure plan
concern on detailed -

why no reference to consent order
will consent order

Joni -
Secondary containment on SET pipeline -
- wants specific on SET construction
- I will check on P&S with SET engineer drawings
- No workplan or moisture monitoring system -

Public notification - concerns
LANL operations, verified by article in New Mexican - believes public help in making improvements
- support website, public posting link to individual stormwater website

- Restricting entry & Signage -
Could there be posting of signs in
Spanish, English & visual, Tiwa
- LANL will consider - Kathy Sanchez
will provide examples.

Verification of Secondary containment

calibration flowmeters - ± 1% systems
are available - protection of groundwater
- 26 years of experience with lab,
public is challenged, calibration is
Significant because in indicator
low levels constituents, are findings
are within calibration specifications.
- more accurate tally of movement
of water,
- Installation of flow meter, CCW
want language in permit regarding
measurement of discharge to SET &
TA-05)
- Conveyance of liquid - LANL
can track timing on incoming TRU
but not low level waste,
- Soil moisture monitoring, baseline should
be established prior to discharge

settled solids concern No public process, would prefer be part of permit so can understand where solids are to go

35k tank include in description of authorization to discharge?

- Closure - Bryan, closure plan needed now to document as new units are added, wants closure plan as part of permit, will pursue legally if necessary.
 180 days in current permit delay permit if necessary. Doesnt serve well with bifurcated proc public input lost.

- Request that extension of time be posted in PRR. NMED response be posted as well don't want LANL to hold posting until NMED response
- Financial Assurance is a prudent thing to do.

- Groundwater Provisions -
 remain concerned that MCOI-6 and regional wells should be replaced

: 12876

refer to Bob Gilkeson reports—
reference RCRA NMED response
concern wells were installed for
Characterization, but not intended
for monitoring—
- Agree with requirement to
install 2 alluvial wells—

- 2 weeks to provide comments
on discussion of today — by Dec 03

- Send SET pdfs
- Send EOC + Emergency Plan

: 12878

No	PgNo	Description	Remaining Issues
1	6	§II.W. Secondary Containment	Before the pipelines between the RLWTF and Outfall 051 and the Solar Evaporative Tanks (SET) are operated, the pipelines must have secondary containment. The Department of Energy (DOE) self-regulates management of its low-level, transuranic and high-level radioactive and mixed radioactive waste through DOE Order 435.1 "Radioactive Waste Management," and the associated Manual, Guidance, and Implementation Guide. They clearly provide that the pipelines from the RLWTF to Outfall 051 and the SET must provide secondary containment. https://www.directives.doe.gov/directives-documents/400-series/0435.1-BOrder-chg1 and Chapter IV "Low-Level Waste Requirements," Implementation Guide for Use with DOE M 435.1-1 ("Implementation Guide"), IV.M.(2)(a) "Confinement. Low-level waste systems and components shall be designed to maintain waste confinement." P. IV-137. *Please note:* DOE O 435.1 requirements for transuranic wastes are the same or similar to those for low-level waste management. In these comments, we have provided links and cites for low-level waste management.] "The objective of this requirement is to ensure the design of low-level waste storage and treatment facilities includes the installation of equipment capable of containing low-level waste so that releases that could result in exposures to workers or the public or that could contaminate the environment are minimized." *Id.* The DOE documents address the "unexpected or uncontrolled release of radioactive material from low-level waste treatment and storage facilities that could impact workers, the public, or the environment." The pipeline carries treated low-level waste over one-half mile from the RLWTF to the SET." *Id.,* and large map provided by Permittees at October 9, 2014 meeting. "Secondary confinement are those systems that provide the next level of confinement and can include process equipment, (e.g., double-walled tanks, double-walled piping systems), as well as curbing and diking of liquid storage tank areas, or secure or closed areas of buildings, that further prevent or mitigate uncontrolled releases of radioactive and/or hazardous materials to the environment. The need for redundancy and the degree of redundancy in these systems is determined by the safety analysis process and maintenance concerns for both active and passive components." *Id.* Mitigation measures are also required to reduce the loss of containment. Implementation Guide, §IV.M.(2)(d), p. IV-147.

			Further, DOE allows the Permittees to use a graded approach to determine "the appropriate level of rigor in applying this control to the management systems employed at a particular low-level waste management facility." *Id.*, p. IV-138. "Consideration of Decontamination and Decommission" applies to new low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials [that] shall be designed to facilitate decontamination. *Id.* at IV.M.(2)(c), p. IV-143. DOE Guidance 435.1-1 was approved on July 9, 1999 and certified on January 9, 2007. For over 15 years, the Permittees have been on notice about the requirements to protect the public and environment, to provide secondary confinement, and to consider impacts of decontamination and decommissioning in the design. We are at a loss to understand why the pipelines to Outfall 051 and the SET, which carry radioactive and hazardous constituents, do not have secondary containment. In order to meet the basic requirements for the treatment and storage of low-level radioactive waste found in DOE Order 435.1-1, CCW, Gilkeson and Sanchez urge the Permittees to replace the pipeline from the RLWTF to the SET to provide for secondary containment. DOE has discussed a "backfit" process and suggestions are provided at Section IV.M.(2) "Low-Level Treatment and Storage Facility Design," p. IV-134. The Permittees should begin the process to backfit the pipelines to Outfall 051 and the SET. The pipeline to Outfall 051 must have secondary containment before it is used again. We have no objection to the Permittees' request to remove the word "primary" from "primary unit."
2	10	§V. Description of SET	We are reviewing the engineering specification and designs and will provide further comments.
3	11	§1. Annual Update - Posting to EPRR	Posting to the Electronic Public Reading Room (EPRR) must be enforceable. We suggest a stepwise approach. If it is discovered that a document was not posted, the Permittees have 14 days after receiving notice from itself, NMED or a member of the public to post it to the EPRR. If it is not posted within that time frame, then failure to do so shall be enforceable under NMAC 20.6.2.1220. Below is the language from the 2010 HazWaste Permit, which may be helpful to include in the permit:

			"1.13 PUBLIC NOTIFICATION VIA ELECTRONIC MAIL (E-MAIL) "The Permittees shall notify individuals by e-mail of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested e-mail notification and send such notices to persons on that list. The notice shall be sent within seven days of the submittal date and shall include a direct link to the specific document to which it relates. "The Permittees shall provide a link on the internet on the Permittees' environmental home page (http://www.lanl.gov/environment) whereby members of the public may submit a request to be placed on the e-mail notification list. In the event that the environmental home page stops operation, the Permittees shall use their best efforts to fully restore the page and its operation as soon as possible." *** Where a Permittee submittal and NMED response is required to be posted to the EPRR, the language needs to be clarified so that it is clear that the Permittees must post the submittal when it is submitted to NMED. We are concerned that the language could be interpreted to read that the Permittees may post their submittal when they receive NMED's response. For example, §12 Freeboard. We provide the following clarifying language from the NMED HazWaste Permit for LANL to ensure the language in the GWDP is clear that the Permittees must promptly post their submittals to NMED and associated replies from NMED: "The Permittees shall notify individuals by e-mail of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested e-mail notification and send such notices to persons on that list. The notice shall be sent within seven days of the submittal date and shall include a direct link to the specific document to which it relates." In order to provide transparency about what is happening with the GWDP, all documents required by it must be promptly posted to the EPRR. Our concerns are heighten after reading the revelations in the recent series of Santa *Fe New Mexican* articles, e.g., "LANL officials downplayed waste's dangers even after WIPP." http://www.santafenewmexican.com/special_reports/from_lanl_to_leak/
4	11	§1. Website	CCW accepts the Permittees' proposal to establish a website six months from the effective date of the permit. An informed, publicly accessible example is the Permittees' Stormwater website at: http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/index.php
5	14	§5.	We are concerned that Permittees cannot restrict entry into the area around the Outfall 051. The radiation

		Restricting Entry	levels are very high in that area not only for workers, but also for the public who might be on a tour of the area.
6	15	§6. Signs	Did NMED conduct government-to-government consultation with the Tribes about the signage? Signs are only required to be in English and Spanish. The requirement should include a requirement for a visual sign – one without words. Below is language from 2010 HazWaste Permit, which may be helpful in the discussions: "2.5.1 Warning Signs "The Permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the permitted units (see 40 CFR § 264.14(c)). Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. The Permittees shall include on the signs the following or an equivalent warning: "DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS) "The Permittees shall post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility's permitted units and the Pueblo of San Ildefonso (PO WHO GEH). "The Permittees shall post signs requested by Santa Clara Pueblo (Kha-'Po). The Permittees shall include on the signs the following warning: Wi-i ts'uni pi' – (DO NOT ENTER)" We have additional information and will submit sign designs to NMED by the end of this week.
7	15	§7. Verification of Secondary Containment	Permittees must verify that systems and units that carry untreated liquid or semi-liquid waste streams meet requirements for secondary containment in §8 below. Permit gives LANL 180 days to verify. The permit should require verification within 30 days of the effective date of the permit. The systems and units that carry radioactive waste are subject to DOE Orders, specifically DOE O 435.1-1. For example, "A highly reliable means of monitoring for releases is the use of secondary confinement which is then checked for waste. It also offers the benefit of providing defense-in-depth in containment of releases of low-level waste." Implementation Guide, §IV.M.(2)(e), p. IV-150. It should be simple for verification of secondary containment because the Permittees already are required to

			verify the systems and units that carry radioactive waste. Permittees should be able to provide the verification information to NMED promptly after the effective date of the permit.
8	15	§8. Water Tightness Testing	Testing for water tightness for the pipelines to the SET and Outfall 051 should begin within 30 days of the effective date of the permit. Are the Permittees testing for water tightness now? We reiterate our argument above for §II.W. Secondary Containment that DOE Orders require these pipelines to have secondary containment. We disagree with the Permittees' request for 540 days, or 18 months, to provide water tightness testing for these pipelines. Permittees are required under DOE Order 435.1 to test systems and units that carry radioactive waste. Implementation Guide, §IV.M.(2)(e), p. IV-150.
9	16	§9 Settled Solids	For clarification, we suggest that the title read "Settled Solids from the MES and SET." We need additional information about the SET settled solids. What are the contents of the liquid waste when it enters the RLWTF? What are the pretreatment processes? What constituents are removed in the pretreatment process? Where are they disposed? What are the entire contents of the discharge to the Outfall 051, SET and MES? What are the unregulated constituents in the discharge to the Outfall 051, SET and MES? What is the total solid content of the discharge to the SET and MES? What are the unregulated solids in the discharge to the SET? Is there an engineering estimate on the predicted solids accumulation rate? What is the estimated time for the SET to fill up to an average of one-foot depth? The settled solids will concentrate the radionuclides and hazardous constituents, while the SET is continuously refilled. For the combined radium-226 and Radium-228, it is estimated that over 8,000 kg will be concentrated in the SET settled solids, assuming a 40,000 gpd discharge over a period of five years. How will overflow be managed? What is the effectiveness of the liner? What happens if the liner leaks? At what point would the liner need to be repaired? What would be the timing for repair? At what point would the liner need to be replaced?

			What is the level of sensitivity of the leak detection system? How much liquid must be in the tank in order to activate the detection system? How much liquid may leak before the system alarms?
10	21	§13 Effluent Limits	We will support Permittees' request to change Condition Nos. 13b and 13d compliance schedules from September 30, 2015 to September 30, 2016 given their request to reduce the daily maximum from 45 mg/L to 30 mg/L and the quarterly average from 15 mg/L to 10 mg/L. Why are the VOCs found in Condition 13, Table 1 not present in Table 2? The title of Condition 13 should read "Effluent Limits: Outfall 051 and SET and MES."
11	22	§15 Emergency Plan	We fully support the NMED position to include the Emergency Plan. The Contingency Plans provide 48 hours to report; in an emergency, notification and actions must be taken immediately. We find Permittees' 11-17-14 proposal to be incomplete. We do not support procedures; we support a plan that includes a list of all emergency equipment at the facility. Communication, collaboration and providing a written summary of the plan and any amendments thereto to the local emergency preparedness and response entities are key. In support for the Emergency Plan, we provide the following from the October 24, 2014 Defense Nuclear Facilities Safety Board (DNFSB) Weekly Report for LANL about ongoing inadequacies/concerns/issues for emergency response at LANL. The DNFSB is "an independent organization within the executive branch chartered with the responsibility of providing recommendations and advice to the President and the Secretary of Energy regarding public health and safety issues at Department of Energy (Department) defense nuclear facilities." http://www.dnfsb.gov/about/who-we-are "**Emergency Management:** Early this month, LANL issued the after action report for the annual full-scale exercise (see 8/29/14 weekly). Their findings included: (1) direct communication between facility incident command and the fire department was never established; (2) the Emergency Operations Center (EOC) was assumed to initially be habitable; however, modeling later showed it to within the plume and protective actions were not re-evaluated, and (3) field office public affairs was not represented. "They also identified 12 opportunities for improvement, including the following of note: (a) additional radiological controls experts should be trained as controller/evaluators;

			(b) the Emergency Manager needs to communicate protective actions using actionable geographical reference points rather than distances, (c) the full screen monitor in the EOC needs repair, (d) the EOC needs more than one information technology support person, and (e) the Los Alamos Medical Center warrants improvements with training on protocols and communications between the decontamination room and emergency room." http://www.dnfsb.gov/sites/default/files/Board%20Activities/Reports/Site%20Rep%20Weekly%20 Reports/Los%20Alamos%20National%20Laboratory/2014/wr_20141024_65.pdf
12	23	§17. Calibration of Flow Meters	Calibration of flow meters will protect groundwater because knowing the amount that is being discharged will provide accurate information for other calculations, such as determining leakage. LANL has stated that is should not be held to flow meter accuracy greater than +/- 10%. However, "ISO 17025-certified meters can achieve +/- 0.05 percent accuracy." Moreover, modern flow meters--of the type one would expect to be used at an advanced laboratory such as LANL-- are even more accurate. "[M]easuring uncertainties of +/- 0.1% of rate are achievable with modern flowmeters." Jerry Stevens & Jason Pennington, "Flowmeter Calibration, Proving, & Verification Ensuring the accuracy & repeatability of your flow measurements (September 26, 2010). Online at: http://www.flowcontrolnetwork.com/articles/calibration-proving-verification Additionally, it is important to note that the ISO/TEC 17025 General Requirements are the doormat for competent testing and calibration laboratories, so one would expect that LANL observe these standards in calibration and measurement. The standard is described as follows: ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories is the main ISO standard used by testing and calibration laboratories. In most major countries, ISO/IEC 17025 is the standard for which most labs must hold accreditation in order to be deemed technically competent. In many cases, suppliers and regulatory authorities will not accept test or calibration results from a lab that is not accredited. Originally known as ISO/IEC Guide 25, ISO/IEC 17025 was initially issued by the International Organization for Standardization in 1999. There are many commonalities with the ISO 9000 standard, but ISO/IEC 17025 is more specific in requirements for competence. And it applies directly to those organizations that produce testing and calibration results. Since its initial release, a second release was made in 2005 after it was agreed that it needed

			to have its quality system words more closely aligned with the 2000 version of ISO 9001. The standard was first published in 1999 and on 12 May 2005 the alignment work of the ISO/CASCO committee responsible for it was completed with the issuance of the reviewed standard. The most significant changes introduced greater emphasis on the responsibilities of senior management, and explicit requirements for continual improvement of the management system itself, and particularly, communication with the customer. The ISO/IEC 17025 standard itself comprises five elements that are Scope, Normative References, Terms and Definitions, Management Requirements and Technical Requirements. The two main sections in ISO/IEC 17025 are Management Requirements and Technical Requirements. Management requirements are primarily related to the operation and effectiveness of the quality management system within the laboratory. Technical requirements include factors which determines the correctness and reliability of the tests and calibrations performed in laboratory. Laboratories use ISO/IEC 17025 to implement a quality system aimed at improving their ability to consistently produce valid results. It is also the basis for accreditation from an accreditation body. Since the standard is about competence, accreditation is simply formal recognition of a demonstration of that competence. A prerequisite for a laboratory to become accredited is to have a documented quality management system. The usual contents of the quality manual follow the outline of the ISO/IEC 17025 standard. On line at: http://en.wikipedia.org/wiki/ISO/IEC_17025 (emphasis added).
13	26	§22. Discharge Volumes	Flow meters don't have to be installed until 180 days after the effective date of the permit. How will the discharge volumes be determined in the interim? Is there a flow meter on the discharge pipe that leaves TA-50, Bldg. 2 that splits to go to the Outfall and SET?
14	26	§23 (b). Waste Tracking	The permit must require waste tracking for both conveyance and discharge of TRU and LLW waste streams. DOE Order 435.1-1 requires waste tracking for low-level radioactive waste. Minimum requirements include: "Engineering controls shall be incorporated in the design and engineering of low-level waste

			treatment and storage facilities to provide volume inventory and to prevent spills, leaks, and overflows from tanks or confinement systems." Implementation Guide, §IV.M.(2)(d), p. IV-146. "Engineering controls in this requirement are considered to be those systems or design characteristics that are provided to prevent the loss of containment from low-level waste management facilities, **and to provide volume inventory data,** where appropriate." Emphasis added. *Id.*, p. IV-147. DOE is required to track its waste by providing volume inventories for low-level waste. By requiring waste tracking, NMED will not be regulating low-level waste, but requiring the Permittees to report their inventories. Also, see comments to §31 below about Settled Solids Removal.
15	27	§25. Soil Moisture Monitoring System for SET	Because the SET has been built, it is appropriate for the Permittees establish the baseline conditions now. Because of the variation in moisture throughout the year, it may be necessary to establish seasonal baseline conditions. This work must be done in the interim before the permit is issued. Otherwise, there should be a prohibition on using the SET until such time as the baseline conditions are established. It will be more difficult to ascertain baseline conditions once the SET is in operation. How will the neutron probes measure the volume of a leak? What is the justification for the 2% specification for absolute variation in volumetric soil moisture content below the SET? We support establishing a performance goal for the neutron probes that would include: 1. level of sensitivity; 2. seasonal variation; and 3. a level of moisture precision that will answer the question: What change in moisture will signify a leak? Please describe the placement and spatial coverage for the neutron moisture probes. Would they be positioned to detect a growing perimeter of a leak, or the depth of a leak, or both? Further, DOE Order 435.1-1 and Implementation Guide requires monitoring and/or leak detection capabilities "shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions." Implementation Guide, §IV.M.(2)(e), p. IV-148.

			"As in implementation of all of the requirements of DOE O 435.1 and DOE M 435.1-1, the graded approach is used for determining the appropriate level of rigor in applying this control to the management systems employed at a particular low-level waste management facility. Also monitoring for leakage and contamination spread needs to be performed by means appropriate for the type and character of radioactive waste being managed at the facility. Rigorous application of this requirement may be most appropriate for circumstances involved storage or treatment of liquid low-level waste, for example, highly acidic liquid waste in a single-walled, mild steel tank may require continuous monitoring coupled with alarms and transfer equipment." *Id.*
16	29	§26, et al., Groundwater Provisions.	We appreciate that NMED is requiring replacement of two alluvial wells. Nevertheless, a new alluvial well is necessary at a location between the two new wells at the site where maximum contaminant levels were measured in the alluvial sediments. Further, an additional alluvial well is needed in Mortandad Canyon at a suitable location that is hydrologically upgradient of Outfall 051. This well is necessary for background water quality data for Mortandad Canyon. We remain concerned about the use MCOI-6 and the regional wells for ground water monitoring purposes. They should also be replaced. We reference the detailed comments of Robert H. Gilkeson, found in Appendix A, "Deficiencies in Ground Water Protection in the Draft Ground Water DP-1132 Permit, by Independent Registered Geologist Robert H. Gilkeson," to the CCW, Gilkeson and Sanchez December 12, 2013 comments for the DP-1132 draft permit. Gilkeson has provided detailed comments about why MCOI-6 and the regional wells need to be replaced. A very serious mistake is that the permit language describes the regional wells as topographically downgradient of the RLWTF. Additionally, NMED has included two additional existing characterization wells (R-1 and R-14) in the regional aquifer monitoring network. The two additional wells are unacceptable because they are: 1) characterization wells (see below); and 2) not hydrologically downgradient of the RLWTF or the Outfall 051. At this time there are no wells that are hydrologically downgradient of the RLWTF or the Outfall 051. At this time there are no regional wells that are hydrologically downgradient of the RLWTF or the Outfall 051.

			In addition, NMED has stated that the wells "were not installed for contaminant detection or groundwater monitoring." We quote from page 31 in the NMED November 2010 General Response to Comments on the LANL RCRA Renewal Permit: "The NAS report [National Academy of Sciences 2007 Final Report] references wells that were installed as part of LANL's groundwater characterization efforts that were conducted in accordance with their Hydrogeologic Work Plan (1998)…. These [characterization] wells were not installed for contaminant detection or groundwater monitoring. Therefore, these wells have limited relevance to groundwater protection goals set forth by the March 1, 2005 Consent Order."
17	29	§27 Ground Water Monitoring Well Replacement	We are concerned about the proposed delay to 90 days for the Permittees to submit the workplans to NMED for installation of the two replacement alluvial wells. We propose that the permit provide that the Permittees allow CCW representatives to witness the drilling of the new wells; that the Permittees will provide the training, if necessary, so that the representatives will meet the requirements to witness the drilling. The Permittees agreed to provide a letter, but as was revealed at the recent meeting, not until after the final permit is issued.
18	34	§31. Settled Solids Removal	We are concerned that there is no public participation requirement for the submittal of the settled solids removal workplan. Because the RLWTF is unlike any other facility in NM, we urge NMED to require the workplan now to be part of the permit that is released for public comment. Additionally, reporting on the nature and amount of solids, timing of disposal at WIPP should be a matter of course, as LANL's "Supplemental Information for Discharge Permit Application DP-1132, Radioactive Liquid Waste Treatment Facility (RLWTF) and Zero Liquid Discharge (ZLD) Solar Evaporation Tanks," ENV-RCRA-12-0173, LAUR-12-21591 (August 10, 2012, as revised) ("Supplement") states at A-8, page 1: "(2) Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Project as a solid transuranic waste." It is, thus, clear that LANL has records of settled solid accumulation and removal that could be share with the public. Additionally, it is clear that these records include the volumes of material being accumulated and processed, which means LANL also can provide this information. In fact, the Supplement goes on to state

			at B-12, page 2: "Transuranic influent is received in batches from TA-55, with influent collected in either the acid tank or caustic tank in Building 50-66. Level probes for these tanks are linked electronically to the RLWTF control room. Operators monitor and record tank level changes during each influent batch transfer. Influent volumes are calculated from the difference between beginning and ending tank levels." Similar data collection applies separately to Low Level Waste, as the Supplement states further that: "Low-level RLW influent volumes will be determined by monitoring and recording the change in level of Tank 5 and Tank 6 in the Waste Management and Risk Management (WMRM) Facility. While radioactive liquid waste (RLW) is being fed to the treatment process from one of these two influent tanks (e.g. Tank 5), the fresh influent will be received in the other influent tank (e.g. Tank 6). In this illustration, the change in the level of Tank 6 from one day to the next will reflect the volume of the influent received." *Id.* It is difficult to imagine that given LANL keeping such records of the influent, they are failing to do so for the treated effluent Low-level RLW. Thus, it is reasonable for LANL to make the input-output date for both Low-level RLW and Transuranic RLW and solidified material available to the NMED and the public. The permit condition should state it only applies to the SET. A statement should be included in the permit that the 1,200-gallon MES reservoir is drained at a frequency of no longer than four weeks. Where were the TA-53 SET settled solids disposed? Will the TA-52 SET settled solids be disposed of at the same facility? The SET has not been used, but holds water from rainfall and snowmelt. What type of inspection will take place before the SET goes into operation to determine the integrity of the exposed liner? Whether the exposed liner has been damaged by UV destruction? What are the manufacturer's specifications for the liner? The DOE specifications for the liner? If the liner must be replaced, we request that NMED and CCW representatives be present to observe the removal to insure the liner is not damaged. We are concerned about the drying of the settled solids containing concentrated radionuclides and hazardous air pollutants so that they turn to dust and be distributed into the air by the wind. What provisions will prevent dust from being created? Is there a buffer zone between allowing the settled solids dry too fast and the need to add liquid?

19	41	§41. Cessation of Operation of Specific Units	We support retention of 75,000-gallon concrete influent storage tank for emergency storage for LLW liquid waste. Should this specific condition be moved to another section, or have its own condition? We suggested listing the tank under V. Authorization to Discharge, where the other operating tanks, etc. is listed.
20	41	§42 Stabilization of Individual Units & Systems	We support NMED's requirement that the workplan provide "a detailed description of the actions that will be taken to investigate and characterize, to the extent possible given site constraints, the potential impact to soil and groundwater from the facility, system, or individual units."
21	42	§43. Closure Plan	The draft permit that is released for public review and comment must include the Closure Plan. There is no schedule for closure. We support NMED's requirement that "a detailed description of the actions that will be taken to investigate and characterize, to the extent possible given site constraints, the potential impact to soil and groundwater from the facility, system, or individual units." At the 11-17-14 meeting, LANS staff said that the Consent Order should be referenced in this Condition. What provision of the Consent Order would be applicable?
22		Financial Assurance	CCW, et al., request financial assurance is required in the GWDP.
23		Reservation of Rights	CCW, et al., reserve the right to object or comment on issues raised or identified by CCW, et al.
24		Air Monitoring	CCNS received the DOE/LANL response to its November 2013 FOIA request. We are reviewing the documents and may have additional comments as a result. Did the Permittees calculate emissions to the air from the MES and SET for constituents other than the radionuclides? If so, please provide to us. Air monitoring for radionuclides and metals should be provided around the SET.
25		Seismic	We question the location of the RLWTF and the SET. Both are located in an area where LANL scientists have shown there are buried active faults, specifically the Rendija Canyon and Guaje Mountain faults. They run generally north and south and splay in the area of Technical Area 50. Volcanoes formed the Jemez Mountains.

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			During site evaluation, DOE Order 435.1 requires, "Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capacity of the site to demonstrate, at a minimum, whether it is … (2) located in a flood plain, a tectonically active area, or in the zone of water table fluctuation…. Implementation Guide, §IV.M.(1)(a), p. IV-120.
26		Tritium	What standards will apply to the discharge of tritium through the Outfall 051, the MES, and the SET? DOE DCG of 2 million pCi/L, the Safe Drinking Water Act level of 20,000 pCi/L, or another standard?
27		Other commenters	How are the other commenters being kept informed about the ongoing discussions? We would appreciate receiving copies of any correspondence and emails, notes from phone calls or other forms of communication. Thank you.

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Page #	Condition No.	Current Language	Proposed Change
9	V.C	*Solar Evaporative Tank system*	*Solar Evaporative Tank S~~s~~ystem*
12	3	*…design or capacity for any of the system, units or components…*	*…design or capacity for any of the systems, units or components…*
12	3	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, LANL.*	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, the Permittees ~~LANL~~.*
14	4	*A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes;*	*A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specifications made during construction (based on field concerns and changes);*
15	6	*Authorized Personnel only*	*Authorized Personnel Only*
17	9	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average volume greater than one foot. In the event that settled solids volumes exceed the volumes defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average depth ~~volume~~ greater than one foot. In the event that settled solids depth ~~volumes~~ exceed the ~~volumes~~ depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*
20	Table 1	Xylenes (total) (total)	Xylenes (total) ~~(total)~~
20	Table 1	Total Nitrogen (sum of TKN+NO_3-N) (total)	Total Nitrogen (sum of TKN (total) +NO_3-N (dissolved)) ~~(total)~~ <u>Basis</u>: Table 2 and Condition No. 14.d identify NO3-N as "dissolved" which is consistent with the regulations (20.6.2.3103 NMAC).
21	14.d	No$_3$-N	NO~~o~~$_3$-N
21	14.d	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No$_3$-N shall apply for discharges to Outfall 051:*	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~:*
23	16	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than annual triennial basis or in the event the plan fails during an emergency,*	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~annual~~ triennial basis or in the event the plan fails during an emergency,*
30	28	*Within 90 days of the effective date of this discharge plan, permittees will submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	*Within 90 days of the effective date of this D~~d~~ischarge ~~plan~~ Permit(by DATE), the P~~p~~ermittees ~~will~~ shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*

Page #	Condition No.	Current Language	Proposed Change
33	31	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, either through a primary or secondary containment unit or system, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release.* *b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.*	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, ~~either through a primary or secondary containment unit or system~~, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:* *~~b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:~~* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *~~c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.~~* Basis: Condition No. 31 is the contingency for Condition No. 8, *Water Tightness Testing.* Condition No. 8 is only applicable to units and systems WITHOUT secondary containment. Accordingly, all references to secondary containment in Condition No. 31 should be removed. In addition, *primary* has been removed from the definition of *Secondary containment*.
34	32	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds one foot…*	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds a depth of one foot…*
36	35.c	*c. Increase the frequency of effluent sampling to adequately establish quality of all discharges by batch.*	*c. Increase the frequency of effluent sampling to adequately establish the quality of ~~all~~ discharges ~~by batch~~, prior to resuming discharges to the system with the exceedance.* Basis: Condition 35.a requires ceasing discharges. As currently written there is not a path to resumption.

Page #	Condition No.	Current Language	Proposed Change
38	37 & 38	*37. Within 30 days following receipt of such notification from NMED,* *38. Within 90 days following receipt of such notification from NMED,*	*37. Within ~~30~~ 90 days following receipt of such notification from NMED,* Basis: Make Conditions Nos. 37 & 38 consistent.
42	42	*(Condition 42)*	*(Condition ~~42~~ 43)*
42	43	*(Condition 43)*	*(Condition ~~43~~ 44)*
42	43.e	*Identification of those portions of the approved Closure Plan*	*Identification of those portions of the ~~approved~~ submitted Closure Plan.* Basis: Per Condition No. 44, the *Closure Plan* is submitted at 180 days which is the same period as the *Stabilization Plan* (120 days for *Stabilization Plan* after cessation period of 60 days). Therefore, no time is available for NMED approval.

Typographical Errors and Minor Editorial Comments, Revised Draft Discharge Permit DP-1132 (Version 12/15/2014) by Communities for Clean Water, Gilkeson & Sanchez

Page #	Condition No.	Current Language	Proposed Change	CCW Response 1-26-15
				Please note: CCW, Gilkeson and Sanchez incorporate all of their previous comments into this submittal.
9	V.C	*Solar Evaporative Tank system*	*Solar Evaporative Tank System*	*OK*
10	V.	The Low-level Radioactive Waste water (RLW) Treatment System	The Low-level Radioactive Waste Water (RLW) Treatment System	
11	V.A.1	The posting of this information and other information as stipulated throughout this permit shall be voluntary, and as such, not enforceable under NMAC 20.6.2.1220.	The posting of this information and other information to the Electronic Public Reading Room (EPPR) shall be enforceable. The Permittees shall notify individuals by email of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested email notification and send such notices to persons on that list. The notice shall be sent within seven (7) days of the submittal date and shall include a direct link to the specific document to which it relates. Within 180 days of the effective date of this Discharge Permit (by DATE), the Permittees will establish a website for this permit. The website will post all of the documents required to be posted in the Electronic Public Reading Room. Permittees may use the Individual NPDES Storm Water Permit website as a model. explain *Please see* comments to Condition 28 below. Basis: NMED must hold the Permittees to the same level of accountability as in the hazardous waste permit. Providing uniformity across the permits, NMED will serve the public with access to the permitting processes (including report submittals, as well as requests for permit modifications, etc.). In order to provide consistency in the NMED, as well as that of the Permittees', relationship with the public, providing uniformity across regulated media in the email notification is necessary. The requested requirement for a direct link to the document is important because in some cases, a direct link is not provided causing the public to waste time looking for the document.	
11	VI.A.1.d.4	4) Ground Water Flow report (VI.A.26)	4) Ground Water Flow report (VI.A.27)	
12	3	*...design or capacity for any of the system, units or components...*	*...design or capacity for any of the systems, units or components...*	*OK*
12	3	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, LANL.*	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, the Permittees ~~LANL~~.*	*OK*
14	4	*A complete copy of record drawings, specifications, final*	*A complete copy of record drawings, specifications, final design calculations, addenda, and*	*OK*

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		design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes;	*change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specifications made during construction (based on field concerns and changes);*	
14	5	The Permittees shall, at all times, prevent the unauthorized entry of persons, wildlife, or livestock into the active portions of this Facility (with the exception of Outfall 051) so that physical contact with the waste streams, structures and equipment is restricted.	The Permittees shall, at all times, prevent the authorized entry of persons, wildlife, or livestock into the active portions of this Facility so that physical contact with the waste streams, structures and equipment is restricted.	this makes no sense
15	6	The Permittees shall post and maintain signs at each entrance to the active portions of the Facility (with the exception of Outfall 051) and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel only.	The Permittees shall post and maintain signs at each entrance to the active portions of the Facility and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel only. Mortandad Canyon??	
15	6	*Authorized Personnel only*	*Authorized Personnel Only*	*OK*
15	8	Within 180 days following the effective date of this Discharge Permit (by DATE), and every 540 days thereafter, the Permitttees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use.	Within 180 days following the effective date of this Discharge Permit (by DATE), and every 180 days thereafter, the Permitttees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use. 1.5 yrs Basis: CCW did not agree to the change from 180 days to 540 days for subsequent water tightness testing of the units and systems. The 180 days is found in the 10-18-14 and 10-31-14 versions of the draft permit, of which the 10-31-14 version was discussed at the November meetings with NMED, the Permittees and CCW. The Permittees' own requirements necessitated that the pipeline between the RLWTF and the SET be constructed to provide secondary containment. The fact that the Permittees did not follow their own requirements should not lessen the timing requirements for water tightness testing for units without secondary containment.	
16	9	A settled solids measurement device shall be utilized to obtain one settled solids thickness measurement (to the nearest half-foot) per area.	A settled solids measurement device shall be utilized to obtain one settled solids thickness measure (to the nearest inch) per area. Basis: There are devices to measure the depth to more accuracy than 50% of the permitted allowance. Permittees should be required to provide more accuracy than 50%.	standard language
17	9	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average volume greater than one foot. In the event that settled solids volumes exceed the volumes defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average depth ~~volume~~ greater than one foot. In the event that settled solids depth ~~volumes~~ exceed the ~~volumes~~ depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	OK
20	Table 1	Xylenes (total) (total)	Xylenes (total) ~~(total)~~	OK

20	Table 1	Total Nitrogen (sum of TKN+NO_3-N) (total)	Total Nitrogen (sum of TKN (total) +NO_3-N (dissolved)) ~~(total)~~ Basis: Table 2 and Condition No. 14.d identify NO3-N as "dissolved" which is consistent with the regulations (20.6.2.3103 NMAC).	OK
20	13.b	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2015, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051 Basis: The 10-31-14 draft permit, which was subject to the meetings with NMED, Permittees and CCW, stated "but no later than September 30, 2015" - not 2016. The Permittees have not provided CCW with the basis for the requested one-year delay. Please provide.	
21	14.d	No_3-N	NO~~o~~$_3$-N	OK
21	14.d	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:*	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~:*	OK
21	14.d	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2015, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~: The 10-31-14 draft permit, which was subject to the meetings with NMED, Permittees and CCW, stated "but no later than September 30, 2015" - not 2016. The Permittees have not provided CCW with the basis for the requested one-year delay. Please provide.	
22	16	Emergency Response Procedures	Emergency Response Plan. Basis: What is the basis for changing the plan to procedures?	
23	16	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than annual triennial basis or in the event the plan fails during an emergency,*	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~annual~~ triennial basis or in the event the plan fails during an emergency,*	CCW supports an annual review.
23	16		The Permittees' written summary shall be provided to the Los Alamos County Emergency Management Coordinator, Los Alamos Fire Department, Los Alamos County Police, Los Alamos Medical Center, New Mexico's Department of Homeland Security and Emergency Management (DHSEM), Pueblo de San Ildefonso, Pueblo of Santa Clara, Pueblo of Jemez and Pueblo of Cochiti, and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). CCW refers NMED to our October 24, 2014 comments about the Emergency Plan and recent Defense Nuclear Facilities Safety Board Weekly Reports about the Permittees' failure to have compliant emergency preparedness in place. *See* page 4 - 5. NMED staff has said, "The RLWTF is not like any other facility we regulate in New Mexico." Communication channels must be opened to local, regional and statewide emergency response organizations to the potential threats and hazards at the Facility.	
23	18	Flow meters shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field	Flow meters shall be calibrated to within plus or minus 0.1 percent of actual flow, as measured under field conditions.	

		conditions.	Basis: With a 10 percent calibration rate for a permit limit of 40,000 gpd could be 4,000 gpd flow that would not be accounted for. 4,000 gpd x 365 days a year could result in unaccountable flows of nearly 1.5 million gallons per year. This is unacceptable. On November 14, 2014 CCW, Gilkeson and Sanchez provided extensive research about how "ISO 17025-certified meters can achieve +/-0.05 percent accuracy" and "measuring uncertainities of +/- 0.1% of rate are achievable with modern flowmeters." *See* p. 3. We do not understand why calibration rates of 100 to 200 times greater are being allowed in the draft permit.	
26	24.d		• The time period in which the waste stream was conveyed to the Facility. Basis: This important information is a missing piece to reconstructing what may be found in the treatment and discharge units.	
28	26	SOIL MOISTURE MONITORING SYTEM FOR THE SET -	SOIL MOISTURE MONITORING SYSTEM FOR THE SET -	
28	26	Within 120 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a proposed workplan, design and schedule for the installation of a moisture monitoring system for the detection of unauthorized releases from the SET.	Permitttees established a baseline for the moisture monitoring system prior to the effective date of this Discharge Permit (by DATE). The baseline addressed the expected seasonal variation for the soil moisture monitoring system. The seasonal baseline provides the performance goals for the monitoring system, including: the level of sensitivity; the porosity of the soil; the precision to determine what change in moisture will signify a leak; the accuracy of the impact for a leak of a certain size, such as 100, 500 and 1,000 gallon leaks; how the perimeter of a leak will be determined; how the depth of a leak will be determined; proposed action levels; and the most effective spatial placement for the monitors,	
30	28	*Within 90 days of the effective date of this discharge plan, permittees will submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	*Within 90 days of the effective date of this Ddischarge ~~plan~~ Permit(by DATE), the Ppermittees ~~will~~ shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	*OK*
30	**28**		The Permittees proposed well installation work plan shall be posted by the Permittees on LANL's Electronic Public Reading Room (EPRR) located at http://eprr.lanl.gov/oppie/service (or as updated). All responses from NMED shall be posted by the Permittees in the EPRR within seven (7) days of their receipt.	
30	**29**	MCOI-6 previously constructed and located in the intermediate aquifer [deleted: presumed to be] hydrologically downgradient of Outfall 051.	MCOI-6 previously constructed and located in the intermediate aquifer presumed to be hydrologically downgradient of Outfall 051.	
30	**29**		CCW refers NMED to the memos that have been submitted by Independent Registered Geologist Robert H. Gilkeson about the defective ground water monitoring wells.	**CCW objects to the use of the defective groundwater monitoring wells R-46, R-60, R-1 and R-14 as previous stated in oral and written comments.**

Page #	Condition No.	Current Language	Proposed Change	
33	31	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, either through a primary or secondary containment unit or system, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release.* *b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.*	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, ~~either through a primary or secondary containment unit or system~~, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:* *~~b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:~~* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *~~c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.~~* Basis: Condition No. 31 is the contingency for Condition No. 8, *Water Tightness Testing*. Condition No. 8 is only applicable to units and systems WITHOUT secondary containment. Accordingly, all references to secondary containment in Condition No. 31 should be removed. In addition, *primary* has been removed from the definition of *Secondary containment*. Basis: Because there is no secondary containment, the amount of time for the Permittees to submit the written proposal for corrective action should be within 30 days after the failure.	OK, with the CCW suggested change
34	32	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds one foot…*	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds a depth of one foot…*	OK
34	32		NMED will provide a 30-day public review and comment period of the plan for the removal and disposal of the settled solids from the unit or system. NMED will provide a Response to Comments document to those who provided written comments. Or	

			The Permittees provide a settled solids removal and disposal plan as part of their application; NMED will incorporate it into the draft permit which will be released for public review, comment and public hearing.	
36	35.c	*c. Increase the frequency of effluent sampling to adequately establish quality of all discharges by batch.*	*c. Increase the frequency of effluent sampling to adequately establish the quality of ~~all~~ discharges ~~by batch~~, prior to resuming discharges to the system with the exceedance.* Basis: Condition 35.a requires ceasing discharges. As currently written there is not a path to resumption.	OK
37	**36**	In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level.	In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 7 days following the date when the soil moisture was initially discovered to exceed the action level. Basis: The Contingency Plan should include a proposed plan for failure of the SET or an occurrence other than a failure of the SET and what corrective action are anticipated to be taken. Allowing an exceedance to migrate for at least 120 days for the corrective action plan to be submitted is unacceptable. The minimum corrective action steps (a) through (d) should be part of the existing Contingency Plan that is subject to public review and comment and request for a public hearing.	
Page #	**Condition No.**	**Current Language**	**Proposed Change**	
38	37 & 38	*37. Within 30 days following receipt of such notification from NMED,* *38. Within 90 days following receipt of such notification from NMED,*	*37. Within ~~30~~ 90 days following receipt of such notification from NMED,* Basis: Make Conditions Nos. 37 & 38 consistent.	*OK, with CCW suggestion below.*
38	37 & 38	Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) construction and lithologic logs, survey data, and a ground water elevation contour map.	Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map. For condition 38, change the color of the http:// address to blue.	
42	42	*(Condition 42)*	*(Condition ~~42~~ 43)*	OK
42	43	*(Condition 43)*	*(Condition ~~43~~ 44)*	OK
42	43.e	*Identification of those portions of the approved Closure Plan*	*Identification of those portions of the ~~approved~~ submitted Closure Plan.* Basis: Per Condition No. 44, the *Closure Plan* is submitted at 180 days which is the same period as the *Stabilization Plan* (120 days for *Stabilization Plan* after cessation period of 60 days). Therefore, no time is available for NMED approval.	CCW does not agree. *Please see* below.
43	44	Within 180 days from the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a written closure plan for the Facility	Retain only: If the Permittees make any changes to the Facility that would affect the implementation of the approved Closure Plan, the Permittees shall submit to NMED for approval a written notification and an amended Closure Plan. Permittees will provide annual updates to NMED	CCW renews our request that the Closure Plan be in the draft

			describing modification to the Closure Plan. All documents required to be submitted to NMED in this Condition by the Permittees along with NMED's responses shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). Public comments will be accepted by NMED regarding this submittal for a period of 30 day. Question: How will the public know when the public comment period begins and ends? We note in our October 24, 2014 comments that slowing down the negotiations by two or three months would "allow the Permittees to submit a more detailed closure plan and post-closure plan and for NMED to work on the plans so that [they] will be part of the permit when it is released for another round of public comments. This suggestion would comply with the New Mexico Water Quality Act and the Ground Water Quality Regulations."	permit that is subject to public review, comment and public hearing.

Typographical Errors and Minor Editorial Comments, Revised Draft Discharge Permit DP-1132 (Version 12/15/2014) by Communities for Clean Water, Gilkeson & Sanchez
~~U.S Department of Energy and Los Alamos National Security, LLC~~ ~~LA-UR-14-29705~~

Page #	Condition No.	Current Language	Proposed Change	CCW Response 1-26-15
				Please note: CCW, Gilkeson and Sanchez incorporate all of their previous comments into this submittal.
9	V.C	*Solar Evaporative Tank system*	*Solar Evaporative Tank ~~s~~System*	OK
10	V.	The Low-level Radioactive Waste water (RLW) Treatment System	The Low-level Radioactive Waste Water (RLW) Treatment System	
11	V.A.1	The posting of this information and other information as stipulated throughout this permit shall be voluntary, and as such, not enforceable under NMAC 20.6.2.1220.	The posting of this information and other information to the Electronic Public Reading Room (EPPR) shall be enforceable. The Permittees shall notify individuals by email of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested email notification and send such notices to persons on that list. The notice shall be sent within seven (7) days of the submittal date and shall include a direct link to the specific document to which it relates. Within 180 days of the effective date of this Discharge Permit (by DATE), the Permittees will establish a website for this permit. The website will post all of the documents required to be posted in the Electronic Public Reading Room. Permittees may use the Individual NPDES Storm Water Permit website as a model. *Please see* comments to Condition 28 below. Basis: NMED must hold the Permittees to the same level of accountability as in the hazardous waste permit. Providing uniformity across the permits, NMED will serve the public with access to the permitting processes (including report submittals, as well as requests for permit modifications, etc.). In order to provide consistency in the NMED, as well as that of the Permittees', relationship with the public, providing uniformity across regulated media in the email notification is necessary. The requested requirement for a direct link to the document is important because in some cases, a direct link is not provided causing the public to waste time looking for the document.	
11	VI.A.1.d.4	4) Ground Water Flow report (VI.A.26)	4) Ground Water Flow report (VI.A.27)	
12	3	*...design or capacity for any of the system, units or components...*	*...design or capacity for any of the systems, units or components...*	OK
12	3	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, LANL.*	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, the Permittees ~~LANL~~.*	OK
14	4	*A complete copy of record drawings, specifications, final*	*A complete copy of record drawings, specifications, final design calculations, addenda, and*	OK

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		design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes;	*change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specifications made during construction (based on field concerns and changes);*	
14	5	The Permittees shall, at all times, prevent the unauthorized entry of persons, wildlife, or livestock into the active portions of this Facility (with the exception of Outfall 051) so that physical contact with the waste streams, structures and equipment is restricted.	The Permittees shall, at all times, prevent the authorized entry of persons, wildlife, or livestock into the active portions of this Facility so that physical contact with the waste streams, structures and equipment is restricted.	
15	6	The Permittees shall post and maintain signs at each entrance to the active portions of the Facility (with the exception of Outfall 051) and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel only.	The Permittees shall post and maintain signs at each entrance to the active portions of the Facility and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel only.	
15	6	*Authorized Personnel only*	*Authorized Personnel Only*	OK
15	8	Within 180 days following the effective date of this Discharge Permit (by DATE), and every 540 days thereafter, the Permittees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use.	Within 180 days following the effective date of this Discharge Permit (by DATE), and every 180 days thereafter, the Permitttees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use. Basis: CCW did not agree to the change from 180 days to 540 days for subsequent water tightness testing of the units and systems. The 180 days is found in the 10-18-14 and 10-31-14 versions of the draft permit, of which the 10-31-14 version was discussed at the November meetings with NMED, the Permittees and CCW. The Permittees' own requirements necessitated that the pipeline between the RLWTF and the SET be constructed to provide secondary containment. The fact that the Permittees did not follow their own requirements should not lessen the timing requirements for water tightness testing for units without secondary containment.	
16	9	A settled solids measurement device shall be utilized to obtain one settled solids thickness measurement (to the nearest half-foot) per area.	A settled solids measurement device shall be utilized to obtain one settled solids thickness measure (to the nearest inch) per area. Basis: There are devices to measure the depth to more accuracy than 50% of the permitted allowance. Permittees should be required to provide more accuracy than 50%.	
17	9	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average volume greater than one foot. In the event that settled solids volumes exceed the volumes defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average depth ~~volume~~ greater than one foot. In the event that settled solids depth ~~volumes~~ exceed the ~~volume~~s depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	OK
20	Table 1	Xylenes (total) (total)	Xylenes (total) ~~(total)~~	OK

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20	Table 1	Total Nitrogen (sum of TKN+NO_3-N) (total)	Total Nitrogen (sum of TKN (total) +NO_3-N (dissolved)) ~~(total)~~ Basis: Table 2 and Condition No. 14.d identify NO3-N as "dissolved" which is consistent with the regulations (20.6.2.3103 NMAC).	OK
20	13.b	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2015, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051 Basis: The 10-31-14 draft permit, which was subject to the meetings with NMED, Permittees and CCW, stated "but no later than September 30, 2015" - not 2016. The Permittees have not provided CCW with the basis for the requested one-year delay. Please provide.	
21	14.d	No_3-N	NOo_3-N	OK
21	14.d	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:*	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~:*	OK
21	14.d	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2015, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~: The 10-31-14 draft permit, which was subject to the meetings with NMED, Permittees and CCW, stated "but no later than September 30, 2015" - not 2016. The Permittees have not provided CCW with the basis for the requested one-year delay. Please provide.	
22	16	Emergency Response Procedures	Emergency Response Plan. Basis: What is the basis for changing the plan to procedures?	
23	16	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than annual triennial basis or in the event the plan fails during an emergency,*	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~annual~~ triennial basis or in the event the plan fails during an emergency,*	CCW supports an annual review.
23	16		The Permittees' written summary shall be provided to the Los Alamos County Emergency Management Coordinator, Los Alamos Fire Department, Los Alamos County Police, Los Alamos Medical Center, New Mexico's Department of Homeland Security and Emergency Management (DHSEM), Pueblo de San Ildefonso, Pueblo of Santa Clara, Pueblo of Jemez and Pueblo of Cochiti, and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). CCW refers NMED to our October 24, 2014 comments about the Emergency Plan and recent Defense Nuclear Facilities Safety Board Weekly Reports about the Permittees' failure to have compliant emergency preparedness in place. *See* page 4 - 5. NMED staff has said, "The RLWTF is not like any other facility we regulate in New Mexico." Communication channels must be opened to local, regional and statewide emergency response organizations to the potential threats and hazards at the Facility.	
23	18	Flow meters shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field	Flow meters shall be calibrated to within plus or minus 0.1 percent of actual flow, as measured under field conditions.	

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		conditions.	Basis: With a 10 percent calibration rate for a permit limit of 40,000 gpd could be 4,000 gpd flow that would not be accounted for. 4,000 gpd x 365 days a year could result in unaccountable flows of nearly 1.5 million gallons per year. This is unacceptable. On November 14, 2014 CCW, Gilkeson and Sanchez provided extensive research about how "ISO 17025-certified meters can achieve +/-0.05 percent accuracy" and "measuring uncertainities of +/- 0.1% of rate are achievable with modern flowmeters." *See* p. 3. We do not understand why calibration rates of 100 to 200 times greater are being allowed in the draft permit.	
26	24.d		• The time period in which the waste stream was conveyed to the Facility. Basis: This important information is a missing piece to reconstructing what may be found in the treatment and discharge units.	
28	26	SOIL MOISTURE MONITORING SYTEM FOR THE SET -	SOIL MOISTURE MONITORING SYSTEM FOR THE SET -	
28	26	Within 120 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a proposed workplan, design and schedule for the installation of a moisture monitoring system for the detection of unauthorized releases from the SET.	Permitttees established a baseline for the moisture monitoring system prior to the effective date of this Discharge Permit (by DATE). The baseline addressed the expected seasonal variation for the soil moisture monitoring system. The seasonal baseline provides the performance goals for the monitoring system, including: the level of sensitivity; the porosity of the soil; the precision to determine what change in moisture will signify a leak; the accuracy of the impact for a leak of a certain size, such as 100, 500 and 1,000 gallon leaks; how the perimeter of a leak will be determined; how the depth of a leak will be determined; proposed action levels; and the most effective spatial placement for the monitors.	
30	28	*Within 90 days of the effective date of this discharge plan, permittees will submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	*Within 90 days of the effective date of this D~~d~~ischarge ~~plan~~ Permit(by DATE), the P~~p~~ermittees ~~will~~ shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	OK
30	28		The Permittees proposed well installation work plan shall be posted by the Permittees on LANL's Electronic Public Reading Room (EPRR) located at http://eprr.lanl.gov/oppie/service (or as updated). All responses from NMED shall be posted by the Permittees in the EPRR within seven (7) days of their receipt.	
30	29	MCOI-6 previously constructed and located in the intermediate aquifer [deleted: presumed to be] hydrologically downgradient of Outfall 051	MCOI-6 previously constructed and located in the intermediate aquifer presumed to be hydrologically downgradient of Outfall 051.	
30	29		CCW refers NMED to the memos that have been submitted by Independent Registered Geologist Robert H. Gilkeson about the defective ground water monitoring wells.	**CCW objects to the use of the defective groundwater monitoring wells R-46, R-60, R-1 and R-14 as previous stated in oral and written comments.**

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Typographical Errors and Minor Editorial Comments, Revised Draft Discharge Permit DP-1132 (Version 12/15/2014) by Communities for Clean Water, Gilkeson & Sanchez
~~U.S Department of Energy and Los Alamos National Security, LLC~~ ~~LA-UR-14-29705~~

Page #	Condition No.	Current Language	Proposed Change	
33	31	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, either through a primary or secondary containment unit or system, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release.* *b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.*	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, ~~either through a primary or secondary containment unit or system~~, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:* *~~b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:~~* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *~~c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.~~* Basis: Condition No. 31 is the contingency for Condition No. 8, *Water Tightness Testing*. Condition No. 8 is only applicable to units and systems WITHOUT secondary containment. Accordingly, all references to secondary containment in Condition No. 31 should be removed. In addition, *primary* has been removed from the definition of *Secondary containment*. Basis: Because there is no secondary containment, the amount of time for the Permittees to submit the written proposal for corrective action should be within 30 days after the failure.	OK, with the CCW suggested change.
34	32	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds one foot…*	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds a depth of one foot…*	OK.
34	32		NMED will provide a 30-day public review and comment period of the plan for the removal and disposal of the settled solids from the unit or system. NMED will provide a Response to Comments document to those who provided written comments. Or	

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			The Permittees provide a settled solids removal and disposal plan as part of their application; NMED will incorporate it into the draft permit which will be released for public review, comment and public hearing.	
36	35.c	*c. Increase the frequency of effluent sampling to adequately establish quality of all discharges by batch.*	*c. Increase the frequency of effluent sampling to adequately establish the quality of ~~all~~ discharges ~~by batch~~, prior to resuming discharges to the system with the exceedance.* Basis: Condition 35.a requires ceasing discharges. As currently written there is not a path to resumption.	OK
37	36	In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level.	In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 7 days following the date when the soil moisture was initially discovered to exceed the action level. Basis: The Contingency Plan should include a proposed plan for failure of the SET or an occurrence other than a failure of the SET and what corrective action are anticipated to be taken. Allowing an exceedance to migrate for at least 120 days for the corrective action plan to be submitted is unacceptable. The minimum corrective action steps (a) through (d) should be part of the existing Contingency Plan that is subject to public review and comment and request for a public hearing.	
Page #	**Condition No.**	**Current Language**	**Proposed Change**	
38	37 & 38	*37. Within 30 days following receipt of such notification from NMED,* *38. Within 90 days following receipt of such notification from NMED,*	*37. Within ~~30~~ 90 days following receipt of such notification from NMED,* Basis: Make Conditions Nos. 37 & 38 consistent.	*OK, with CCW suggestion below.*
38	37 & 38	Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) construction and lithologic logs, survey data, and a ground water elevation contour map.	Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map. For condition 38, change the color of the http:// address to blue.	
42	42	*(Condition 42)*	*(Condition ~~42~~ 43)*	OK
42	43	*(Condition 43)*	*(Condition ~~43~~ 44)*	OK
42	43.e	*Identification of those portions of the approved Closure Plan*	*Identification of those portions of the ~~approved~~ submitted Closure Plan.* Basis: Per Condition No. 44, the *Closure Plan* is submitted at 180 days which is the same period as the *Stabilization Plan* (120 days for *Stabilization Plan* after cessation period of 60 days). Therefore, no time is available for NMED approval.	CCW does not agree. *Please see below.*
43	44	Within 180 days from the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a written closure plan for the Facility.	Retain only: If the Permittees make any changes to the Facility that would affect the implementation of the approved Closure Plan, the Permittees shall submit to NMED for approval a written notification and an amended Closure Plan. Permittees will provide annual updates to NMED	CCW renews our request that the Closure Plan be in the draft

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			describing modification to the Closure Plan. All documents required to be submitted to NMED in this Condition by the Permittees along with NMED's responses shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). Public comments will be accepted by NMED regarding this submittal for a period of 30 day. Question: How will the public know when the public comment period begins and ends? We note in our October 24, 2014 comments that slowing down the negotiations by two or three months would "allow the Permittees to submit a more detailed closure plan and post-closure plan and for NMED to work on the plans so that [they] will be part of the permit when it is released for another round of public comments. This suggestion would comply with the New Mexico Water Quality Act and the Ground Water Quality Regulations."	permit that is subject to public review, comment and public hearing.

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Typographical Errors and Minor Editorial Comments, Revised Draft Discharge Permit DP-1132 (Version 12/15/2014) by Communities for Clean Water, Gilkeson & Sanchez
~~U.S Department of Energy and Los Alamos National Security, LLC~~
~~LA-UR-14-29705~~

Page #	Condition No.	Current Language	Proposed Change	CCW Response 1-26-15
				Please note: CCW, Gilkeson and Sanchez incorporate all of their previous comments into this submittal.
9	V.C	*Solar Evaporative Tank system*	*Solar Evaporative Tank ~~s~~System*	*OK*
10	V.	The Low-level Radioactive Waste water (RLW) Treatment System	The Low-level Radioactive Waste Water (RLW) Treatment System	
11	V.A.1	The posting of this information and other information as stipulated throughout this permit shall be voluntary, and as such, not enforceable under NMAC 20.6.2.1220.	The posting of this information and other information to the Electronic Public Reading Room (EPPR) shall be enforceable. The Permittees shall notify individuals by email of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested email notification and send such notices to persons on that list. The notice shall be sent within seven (7) days of the submittal date and shall include a direct link to the specific document to which it relates. Within 180 days of the effective date of this Discharge Permit (by DATE), the Permittees will establish a website for this permit. The website will post all of the documents required to be posted in the Electronic Public Reading Room. Permittees may use the Individual NPDES Storm Water Permit website as a model. *Please see* comments to Condition 28 below. Basis: NMED must hold the Permittees to the same level of accountability as in the hazardous waste permit. Providing uniformity across the permits, NMED will serve the public with access to the permitting processes (including report submittals, as well as requests for permit modifications, etc.). In order to provide consistency in the NMED, as well as that of the Permittees', relationship with the public, providing uniformity across regulated media in the email notification is necessary. The requested requirement for a direct link to the document is important because in some cases, a direct link is not provided causing the public to waste time looking for the document.	
11	VI.A.1.d.4	4) Ground Water Flow report (VI.A.26)	4) Ground Water Flow report (VI.A.27)	
12	3	*...design or capacity for any of the system, units or components...*	*...design or capacity for any of the systems, units or components...*	*OK*
12	3	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, LANL.*	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, the Permittees ~~LANL~~.*	*OK*
14	4	*A complete copy of record drawings, specifications, final*	*A complete copy of record drawings, specifications, final design calculations, addenda, and*	*OK*

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		design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes;	*change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specifications made during construction (based on field concerns and changes);*	
14	5	The Permittees shall, at all times, prevent the unauthorized entry of persons, wildlife, or livestock into the active portions of this Facility (with the exception of Outfall 051) so that physical contact with the waste streams, structures and equipment is restricted.	The Permittees shall, at all times, prevent the authorized entry of persons, wildlife, or livestock into the active portions of this Facility so that physical contact with the waste streams, structures and equipment is restricted.	
15	6	The Permittees shall post and maintain signs at each entrance to the active portions of the Facility (with the exception of Outfall 051) and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel only.	The Permittees shall post and maintain signs at each entrance to the active portions of the Facility and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel only.	
15	6	*Authorized Personnel only*	*Authorized Personnel Only*	OK
15	8	Within 180 days following the effective date of this Discharge Permit (by DATE), and every 540 days thereafter, the Permittees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use.	Within 180 days following the effective date of this Discharge Permit (by DATE), and every 180 days thereafter, the Permittees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use. Basis: CCW did not agree to the change from 180 days to 540 days for subsequent water tightness testing of the units and systems. The 180 days is found in the 10-18-14 and 10-31-14 versions of the draft permit, of which the 10-31-14 version was discussed at the November meetings with NMED, the Permittees and CCW. The Permittees' own requirements necessitated that the pipeline between the RLWTF and the SET be constructed to provide secondary containment. The fact that the Permittees did not follow their own requirements should not lessen the timing requirements for water tightness testing for units without secondary containment.	
16	9	A settled solids measurement device shall be utilized to obtain one settled solids thickness measurement (to the nearest half-foot) per area.	A settled solids measurement device shall be utilized to obtain one settled solids thickness measure (to the nearest inch) per area. Basis: There are devices to measure the depth to more accuracy than 50% of the permitted allowance. Permittees should be required to provide more accuracy than 50%.	
17	9	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average volume greater than one foot. In the event that settled solids volumes exceed the volumes defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average depth ~~volume~~ greater than one foot. In the event that settled solids depth ~~volumes~~ exceed the ~~volumes~~ depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	OK
20	Table 1	Xylenes (total) (total)	Xylenes (total) ~~(total)~~	OK

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20	Table 1	Total Nitrogen (sum of TKN+NO_3-N) (total)	Total Nitrogen (sum of TKN (total) +NO_3-N (dissolved)) ~~(total)~~ Basis: Table 2 and Condition No. 14.d identify NO3-N as "dissolved" which is consistent with the regulations (20.6.2.3103 NMAC).	OK	
20	13.b	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2015, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051 Basis: The 10-31-14 draft permit, which was subject to the meetings with NMED, Permittees and CCW, stated "but no later than September 30, 2015" - not 2016. The Permittees have not provided CCW with the basis for the requested one-year delay. Please provide.		**Formatted:** Font: 9 pt
21	14.d	No_3-N	NOo$_3$-N	OK	
21	14.d	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:*	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~:*	OK	**Formatted:** Font: Not Italic
21	14.d	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:	Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2015, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~: The 10-31-14 draft permit, which was subject to the meetings with NMED, Permittees and CCW, stated "but no later than September 30, 2015" - not 2016. The Permittees have not provided CCW with the basis for the requested one-year delay. Please provide.		**Formatted:** Font: Not Italic **Formatted:** Font: Not Italic **Formatted:** Font: Not Italic
22	16	Emergency Response Procedures	Emergency Response Plan Basis: What is the basis for changing the plan to procedures?		**Formatted:** Font: Not Italic **Formatted:** Font: Not Italic
23	16	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than annual triennial basis or in the event the plan fails during an emergency,*	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~annual~~ triennial basis or in the event the plan fails during an emergency,*	CCW supports an annual review.	**Formatted:** Font: Not Italic
23	16		The Permittees' written summary shall be provided to the Los Alamos County Emergency Management Coordinator, Los Alamos Fire Department, Los Alamos County Police, Los Alamos Medical Center, New Mexico's Department of Homeland Security and Emergency Management (DHSEM), Pueblo de San Ildefonso, Pueblo of Santa Clara, Pueblo of Jemez and Pueblo of Cochiti, and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). CCW refers NMED to our October 24, 2014 comments about the Emergency Plan and recent Defense Nuclear Facilities Safety Board Weekly Reports about the Permittees' failure to have compliant emergency preparedness in place. *See* page 4 - 5. NMED staff has said, "The RLWTF is not like any other facility we regulate in New Mexico." Communication channels must be opened to local, regional and statewide emergency response organizations to the potential threats and hazards at the Facility.		**Formatted:** Font: Italic **Formatted:** Indent: Left: 0"
23	18	Flow meters shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field	Flow meters shall be calibrated to within plus or minus 0.1 percent of actual flow, as measured under field conditions.		**Formatted:** Font: Not Italic

		conditions.	Basis: With a 10 percent calibration rate for a permit limit of 40,000 gpd could be 4,000 gpd flow that would not be accounted for. 4,000 gpd x 365 days a year could result in unaccountable flows of nearly 1.5 million gallons per year. This is unacceptable. On November 14, 2014 CCW, Gilkeson and Sanchez provided extensive research about how "ISO 17025-certified meters can achieve +/-0.05 percent accuracy" and "measuring uncertainities of +/- 0.1% of rate are achievable with modern flowmeters." *See* p. 3. We do not understand why calibration rates of 100 to 200 times greater are being allowed in the draft permit.	
26	24.d		• The time period in which the waste stream was conveyed to the Facility. Basis: This important information is a missing piece to reconstructing what may be found in the treatment and discharge units.	
28	26	SOIL MOISTURE MONITORING SYTEM FOR THE SET -	SOIL MOISTURE MONITORING SYSTEM FOR THE SET -	
28	26	Within 120 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a proposed workplan, design and schedule for the installation of a moisture monitoring system for the detection of unauthorized releases from the SET.	Permitttees established a baseline for the moisture monitoring system prior to the effective date of this Discharge Permit (by DATE). The baseline addressed the expected seasonal variation for the soil moisture monitoring system. The seasonal baseline provides the performance goals for the monitoring system, including: the level of sensitivity; the porosity of the soil; the precision to determine what change in moisture will signify a leak; the accuracy of the impact for a leak of a certain size, such as 100, 500 and 1,000 gallon leaks; how the perimeter of a leak will be determined; how the depth of a leak will be determined; proposed action levels; and the most effective spatial placement for the monitors.	
30	28	*Within 90 days of the effective date of this discharge plan, permittees will submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	*Within 90 days of the effective date of this ~~D~~discharge ~~plan~~ Permit(by DATE), the ~~P~~permittees ~~will~~ shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	OK
30	28		The Permittees proposed well installation work plan shall be posted by the Permittees on LANL's Electronic Public Reading Room (EPRR) located at http://eprr.lanl.gov/oppie/service (or as updated). All responses from NMED shall be posted by the Permittees in the EPRR within seven (7) days of their receipt.	
30	29	MCOI-6 previously constructed and located in the intermediate aquifer [deleted: presumed to be] hydrologically downgradient of Outfall 051	MCOI-6 previously constructed and located in the intermediate aquifer presumed to be hydrologically downgradient of Outfall 051.	
30	29		CCW refers NMED to the memos that have been submitted by Independent Registered Geologist Robert H. Gilkeson about the defective ground water monitoring wells.	**CCW objects to the use of the defective groundwater monitoring wells R-46, R-60, R-1 and R-14 as previous stated in oral and written comments.**

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Page #	Condition No.	Current Language	Proposed Change	
33	31	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, either through a primary or secondary containment unit or system, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release.* *b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:* *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* *c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.*	*In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:* *a. If the unit or system failure resulted in an unauthorized release, ~~either through a primary or secondary containment unit or system~~, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:* ~~*b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:*~~ *1) The Permittees shall remove the unit or system from service immediately; and* *2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.* ~~*c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.*~~ Basis: Condition No. 31 is the contingency for Condition No. 8, *Water Tightness Testing*. Condition No. 8 is only applicable to units and systems WITHOUT secondary containment. Accordingly, all references to secondary containment in Condition No. 31 should be removed. In addition, *primary* has been removed from the definition of *Secondary containment.* Basis: Because there is no secondary containment, the amount of time for the Permittees to submit the written proposal for corrective action should be within 30 days after the failure.	OK, with the CCW suggested change.
34	32	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds one foot…*	*In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds a depth of one foot…*	OK.
34	32		NMED will provide a 30-day public review and comment period of the plan for the removal and disposal of the settled solids from the unit or system. NMED will provide a Response to Comments document to those who provided written comments. Or	

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			The Permittees provide a settled solids removal and disposal plan as part of their application; NMED will incorporate it into the draft permit which will be released for public review, comment and public hearing.	
36	35.c	*c. Increase the frequency of effluent sampling to adequately establish quality of all discharges by batch.*	*c. Increase the frequency of effluent sampling to adequately establish the quality of ~~all~~ discharges ~~by batch~~, prior to resuming discharges to the system with the exceedance.* Basis: Condition 35.a requires ceasing discharges. As currently written there is not a path to resumption.	OK.
37	36	In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level.	In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 7 days following the date when the soil moisture was initially discovered to exceed the action level. Basis: The Contingency Plan should include a proposed plan for failure of the SET or an occurrence other than a failure of the SET and what corrective action are anticipated to be taken. Allowing an exceedance to migrate for at least 120 days for the corrective action plan to be submitted is unacceptable. The minimum corrective action steps (a) through (d) should be part of the existing Contingency Plan that is subject to public review and comment and request for a public hearing.	
Page #	**Condition No.**	**Current Language**	**Proposed Change**	
38	37 & 38	*37. Within 30 days following receipt of such notification from NMED,* *38. Within 90 days following receipt of such notification from NMED,*	*37. Within ~~30~~ 90 days following receipt of such notification from NMED,* Basis: Make Conditions Nos. 37 & 38 consistent.	*OK, with CCW suggestion below.*
38	37 & 38	Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) construction and lithologic logs, survey data, and a ground water elevation contour map.	Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map. For condition 38, change the color of the http:// address to blue.	
42	42	*(Condition 42)*	*(Condition ~~42~~ 43)*	OK.
42	43	*(Condition 43)*	*(Condition ~~43~~ 44)*	OK.
42	43.e	*Identification of those portions of the approved Closure Plan*	*Identification of those portions of the ~~approved~~ submitted Closure Plan.* Basis: Per Condition No. 44, the *Closure Plan* is submitted at 180 days which is the same period as the *Stabilization Plan* (120 days for *Stabilization Plan* after cessation period of 60 days). Therefore, no time is available for NMED approval.	CCW does not agree. *Please see below.*
43	44	Within 180 days from the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a written closure plan for the Facility.	Retain only: If the Permittees make any changes to the Facility that would affect the implementation of the approved Closure Plan, the Permittees shall submit to NMED for approval a written notification and an amended Closure Plan. Permittees will provide annual updates to NMED	CCW renews our request that the Closure Plan be in the draft

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			describing modification to the Closure Plan. All documents required to be submitted to NMED in this Condition by the Permittees along with NMED's responses shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). Public comments will be accepted by NMED regarding this submittal for a period of 30 day. Question: How will the public know when the public comment period begins and ends? We note in our October 24, 2014 comments that slowing down the negotiations by two or three months would "allow the Permittees to submit a more detailed closure plan and post-closure plan and for NMED to work on the plans so that [they] will be part of the permit when it is released for another round of public comments. This suggestion would comply with the New Mexico Water Quality Act and the Ground Water Quality Regulations."	permit that is subject to public review, comment and public hearing.

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Huddleson, Steven, NMENV

From: Beers, Bob <bbeers@lanl.gov>
Sent: Tuesday, December 02, 2014 2:37 PM
To: Huddleson, Steven, NMENV
Cc: Del Signore, Chris; Saladen, Michael Thomas; McMichael, Susan Lynn; Bill C. Scott; Turner, Gene E; Dorries, Alison Marie
Subject: Draft Discharge Permit DP-1132, List of Other Wastestreams
Attachments: Wastestreams Conveyed from the LANL RLWTF_12-2-2014.pdf

Hi Steve,

At the November 17, 2014, permit negotiation meeting one of the remaining issues with Draft Discharge Permit DP-1132 identified by DOE/LANS is the following requirement in Condition No. 23, *Waste Tracking*:

- *"Permittees shall maintain written or electronic records of all wastestreams conveyed to or from the Facility"*.

At the conclusion of the above-referenced meeting I committed to provide you with a list of the liquid and non-liquid wastestreams generated by the RLWTF. A copy of the wastestream list is attached.

As you know, DOE/LANS believe that subjecting *all* liquid and non-liquid wastestreams conveyed from the Facility to regulation by Discharge Permit DP-1132 is outside the purpose of Section 20.6.2.3101 NMAC, "....*controlling discharges onto or below the surface of the ground to protect all ground water of the State of New Mexico...*". Please note that all of the wastestreams cited in the attached list are disposed of in accordance with other applicable state or federal regulations.

Please call me at 505-667-7969 if you have any questions on this matter.

Sincerely,

Bob Beers
Los Alamos National Security, LLC
5058-667-7969

LA-UR-14-28989

Wastestreams Conveyed from the TA-50 RLWTF
(Excluding discharges to the MES, NPDES Outfall 051, and SET)

1. Liquids:
   - RLW bottoms

2. Solids:
   - Low-level sludge
   - TRU sludge
   - Low-level solid waste (PPE, sample bottles, filters, membranes, old pumps, etc.)

3. Non-rad liquids:
   - Sanitary wastewater discharge from water fountains, sinks, urinals, commodes
   - Spent oil

4. Non-rad Solids:
   - NM Special Waste (mostly light bulbs)
   - Unused chemicals
   - Industrial solid waste (to municipal landfill)
   - Recycled waste (e.g., paper, aluminum, plastic, cardboard, etc)

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EST 1943

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
PO Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666

National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87545
(505) 667-5794/Fax (505) 667-5948

Date: JAN 13 2014
Symbol: ENV-DO-15-0006
LA-UR: 14-29666
Locates Action No.: N/A

Mr. Jerry Schoeppner, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Mr. Schoeppner:

Subject: Discharge Plan DP-1132 Quarterly Report, Fourth Quarter 2014, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the fourth quarter 2014 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the fourth quarter of 2014, no effluent was discharged to either the National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at Technical Area (TA)-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells
Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial wells MCO-6 and MCO-7 during the fourth quarter of 2014. No samples were collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Detailed information on the condition of MCO-3 was submitted to the NMED in December 2013 (ENV-DO-13-0316). No samples were collected from alluvial well MCO-4B because there was insufficient water in the well for sampling. Samples from MCO-6 and MCO-7 were submitted to GEL Laboratories LLC (GEL) for analysis.

All of the analytical results were below the New Mexico Water Quality Control Commission (NMWQCC) 3103 standards for nitrate-nitrogen (NO_3-N), fluoride (F), and total dissolved solids (TDS). Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the fourth quarter of 2014 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the fourth quarter of 2014 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:RSB/lm

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Hai Shen, NA-LA, (E-File)
Gene E. Turner, NA-LA, (E-File)
Kirsten Laskey, NA-LA, (E-File)
Michael A. Lansing, PADOPS, (E-File)
Amy E. De Palma, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Randal S. Johnson, DSESH-TA55, (E-File)
Stephen G. Cossey, DSESH-TA55, (E-File)
Michael T. Saladen, ENV-CP, (E-File)
Robert S. Beers, ENV-CP, (E-File)
Leslie K. Sonnenberg, ADNHHO, (E-File)
John C. Del Signore, TA-55 RLW, (E-File)
lasomailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, (E-File)
env-correspondence@lanl.gov, (E-File)

Table 1.0. Mortandad Canyon Alluvial Well Sampling, 4th Quarter, 2014.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B		Dry[6]	Dry[6]	Dry[6]	Dry[6]	Dry[6]	Dry[6]	Dry[6]
MCO-6	F	11/21/2014	9.45	0.45	0.10	0.0357J[5]	466	0.11
MCO-6 field duplicate	F	11/21/2014	9.85	0.89	0.0727J[5]	0.05	474	0.826J[5]
MCO-7	F	11/24/2014	11.9	1.5	0.0969J[5]	0.20	399	0.973J[5]
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

Notes:

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

[5]J flag indicates an estimated detection. The result was greater than the Method Detection Limit (MDL) but less than the Reporting Limit (RL).

[6]Dry means that there was insufficient water in the well for sampling.

Huddleson, Steven, NMENV

From: Joni Arends <jarends@nuclearactive.org>
Sent: Monday, March 16, 2015 11:55 AM
To: Huddleson, Steven, NMENV; Beers, Bob
Cc: Hower, Jennifer, NMENV; Jon Block; Lindsay Lovejoy; rconn@amigosbravos.org
Subject: Re: Agenda items for Tuesday 3/17 meeting
Attachments: Screenshot 2015-03-13 ZLD p. 61.png; Screenshot 2015-03-13 ZLD p. 62.png

Hi Steve and All,
Below are agenda items from CCW for the meeting tomorrow.
Best,
Joni

1. Why were the leak detection standpipe and leak detection level switch not installed? Eng. Drawings, p. 61 of 88. See attached.

2. Why was the manual bypass and valve not installed at TA-52 pump & equipment package? Eng. Drawings, p. 62 of 88. See attached.

3. Question emailed to Permittees on 2/4/15. No response received from Permittees.

I would appreciate clarification about the MES. I found reference to an evaporative system - see below - and am wondering if this is the MES. It appears that the MES is the TK-6 and TK-5 in Bldg. 250. If this is not correct, please provide the location and tank number of the MES. Thank you.

> The effluent evaporator is constructed of 316 stainless steel, and has approximate dimensions of 17′ x 9′ x 10′ (L x W x H). The evaporator is equipped with two natural-gas burners with low-NOx controls, a 6000-CFM blower, a heat exchanger, and a stack mist eliminator. It has a capacity of 4.5 million BTU per hour. The evaporator and its components are protected within a weather-resistant housing identified as Building 50-250, which is located about 20 feet east of Room 34B of Building 50-01.
>
> From the treated water storage tanks in Room 34B, water is pumped into a reservoir (capacity of ~1700 gallons) at the evaporator. Water in the reservoir is heated to boiling, and leaves via the stack as a vapor. Evaporation lowers the water level in the reservoir, and triggers a call for more water to be automatically fed to the reservoir. Either or both burners can be used to heat the water.

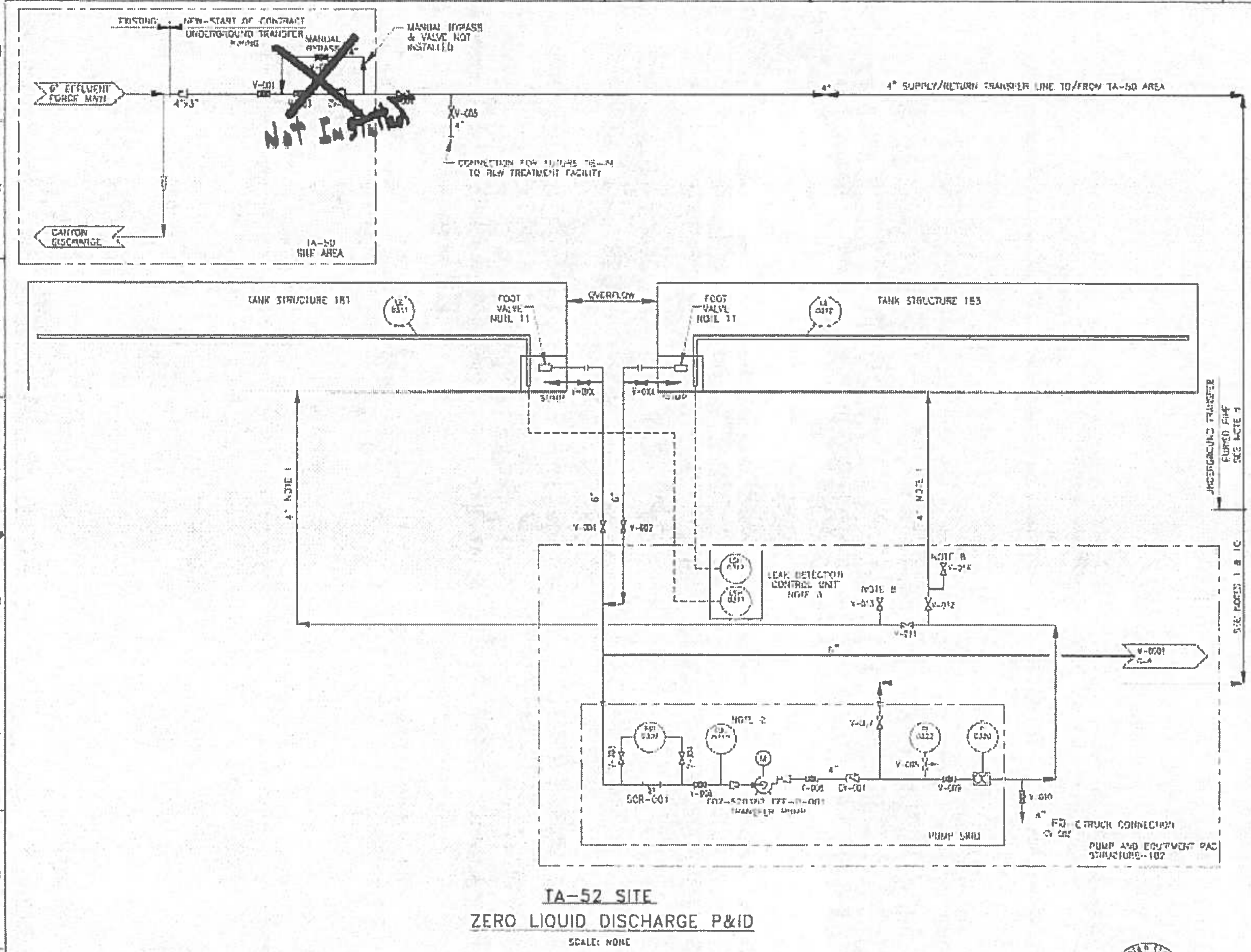
"Radioactive Liquid Waste Treatment Facility Discharges in 2011," by J.C. Del Signore, March 2012, LA-UR-12-21423, p. 9 of 9.

Further, I found that the MES is evaporating about 5 million liters - or about 1,320,860 gallons - per year. "Radionuclide NESHAP Evaluation of Evaporation of Treated Effluent from the RLWTF at LANL TA-50," LA-UR-13-29271. Please describe the treatment sequence.

On 3/13/15 1:00 PM, Huddleson, Steven, NMENV wrote:

Please send for consideration specific items you would like to place on the agenda relative to DP-1132 for Tuesdays meeting. Attached are the comments from the December Draft.

Steve Huddleson, P.G., C.P.G.
Environmental Scientist
Groundwater Protection Bureau
New Mexico Environment Department
(505) 827-2936



TA-52 SITE

ZERO LIQUID DISCHARGE P&ID

SCALE: NONE

GENERAL NOTES:

1. HEAT TRACE ABOVEGROUND PIPING ONLY AS REQUIRED. SE[E] THIS DRAWING AND DRAWING M-1014. HEAT TRACING OF T[HE] GROUND SUPPLY/RETURN TRANSFER LINE TO/FROM TA-50 SHALL BE PROVIDED. HEAT TRACING AND INSULATION SHAL[L BE] PROVIDED DOWN TO THE FROST LINE AND INTO STRUCTUR[E]. PIPING WILL BE FURNISHED AND INSTALLED BY THE PUM[P] EQUIPMENT PACKAGE AND COORDINATED WITH OTHER PACK[AGES].
2. LOW FLOW SWITCH WILL CAUSE PUMP TO TRIP IF PUMP F[LOW DROPS] OR RUNS DRY (AFTER DELAY).
3. LEAK DETECTION ALARMS ARE DIRECTED TO A LOCAL ALAR[M] WITH FLASHING BEACON, AT THE PUMPS AND STRUCTURE.
4. NOT USED.
5. ALL VALVES ON THIS DRAWING HAVE A PREFIX OF "[illegible]" (i.e. EFF-V-001).
6. SEE "BILL OF MATERIALS" DRAWINGS M-7001, M-7002 AN[D] FOR DETAILS AND REQUIREMENTS FOR EQUIPMENT AND SP[ECIFICATIONS].
7. SEE "VALVE SCHEDULES" DRAWINGS M-2002 AND M-2004 AND REQUIREMENTS FOR VALVES.
8. TRANSFER LINES TO TANKS TO BE FREE DRAINING. LOCATE ¾" VENT VALVES (NORMALLY CLOSED) AT HIGH POINT NEA[R].
9. UNDERGROUND TRANSFER PIPING PACKAGE SHALL TERMINA[TE] TRANSFER PIPE ABOVEGROUND AND FIVE (5') FEET AWAY [FROM] PUMPS AND EQUIPMENT PAD. PIPING SHALL BE PROVIDED [WITH A] TEMPORARY COVER TO PREVENT CONTAMINATION AND FOR [COMPLETION] OF TESTING. FINAL CONNECTION TO PIPING FROM THE PUM[P AND] EQUIPMENT SKIDS WILL BE COMPLETED BY THE [illegible] AND PACKAGE.
10. PUMP AND EQUIPMENT PACKAGE SHALL CON[illegible] PIPING FROM THE PUMP AND EQUIPMENT SK[illegible] FINAL CONNECTION TO THE UNDERGROUND TRANSFER PIPIN[G] SHALL BE PROVIDED WITH A TEMPORARY COVER TO PREVE[NT] CONTAMINATION AND FOR COMPLETION OF TESTING. REMOV[AL OF] TEMPORARY COVERS AND THE FINAL CONNECTION TO THE [UNDERGROUND] TRANSFER PIPING, AS COMPLETED BY THE UNDERGROUND PIPING PACKAGE, SHALL BE MADE BY THE PUMP AND EQU[IPMENT] PACKAGE.
11. [illegible] VALVE, MODEL 65.

SEQUENCE OF OPERATION:

TRANSFER PUMP

LOW FLOW SWITCH FSL-0310 WILL CAUSE TRANSFER PUMP [TO TRIP] IF PUMP FLOW DROPS OR RUNS DRY (AFTER DELAY). WITH [illegible] [illegible] TANK CONTENTS CAN BE TRANSFERRED FROM ONE TA[NK TO] ANOTHER TANK OR RETURNED TO SOURCE (TA-50 AREA) BY T[HE] PUMP. TO [illegible] TRANSFER SYSTEM AND [illegible] THE SYSTEM, MAKE SURE ALL SYSTEM VALVES ARE OPEN INCLUDING [illegible] VENT VALVES EFF-V-013 AND EFF-V-014 TO ALLOW [DRAINING] OF DISCHARGE HEADERS. OPERATION OF THE TRANSFER PUMP [AND] COINCIDENT OPERATION OF THE SPRAY PUMPS IS NOT A SYST[EM] REQUIREMENT. THEREFORE, THE TRANSFER PUMP SHOULD NOT [BE OPERATED] WHEN THE ONE OR BOTH OF THE SPRAY PUMPS ARE OPERATI[NG]. [illegible] SHALL BE LEFT OPEN DURING OPERATION (RUNNING) OF THE T[RANSFER] PUMP.

LEAK DETECTION:

LEAK DETECTED BY LSH-0311 OR LSH-0312 ALARMS DIRECTE[D TO] A LOCAL ALARM PANEL AT THE PUMPS. IN ADDITION, A FLASHI[NG] BEACON, VISIBLE FROM THE ROAD, LOCATED ON TOP OF AN EIGHT (8') FOOT HIGH POLE NEAR THE PUMPS, SHALL ALARM [AND] MONITOR FOR TANK LEAKAGE THROUGH THE LINER.

TRUCK CONNECTION:

A CONNECTION WITH A SHUTOFF AND CHECK VALVE ENDING W[ITH A] FLANGE HAS BEEN PROVIDED FOR EMERGENCY EMPTYING OF [A] A TANK OR TANKS CONTENTS TO A TANKER TRUCK FOR REMO[VAL]. BLIND FLANGE SHALL BE MODIFIED BY OPERATIONS FOR A SUI[TABLE] CONNECTION COMPATIBLE FOR THE TANKER TRUCKS SERVICING. REQUIRED HOSE OR TEMPORARY PIPING FROM THE PROVIDED C[ONNECTION] SHALL BE PROVIDED BY OPERATIONS OR AS FURNISHED WITH [THE] TRUCKS. THE TRANSFER PUMP CAN BE USED TO FILL THE TAN[K] WITH THE FILLING RATE CONTROLLED BY GLOBE V[ALVE] EFF-V-016.

B	08/23/12			[illegible]	
4	6/22/12			RECORD DRAWING REFLECTING CONTRACTOR REPORTED FIELD CHANGES.	[illegible]
3	4/26/12			REVISED LOCATION OF VALVES V-001 AND V-002, AND TRANSFER PUMP SEQUENCE OF OPERATION.	[illegible]
NO.	DATE	CLASS		DESCRIPTION	

ZERO LIQUID DISCHARGE SUBPROJECT

ZERO LIQUID DISCHARGE TRANSFER SYSTEM P&ID AND SEQUENCE OF OPERATION TA-50 TA-52 TA-53

BLDG 181, 182, 183

Los Alamos NATIONAL LABORATORY

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100761 C-55751

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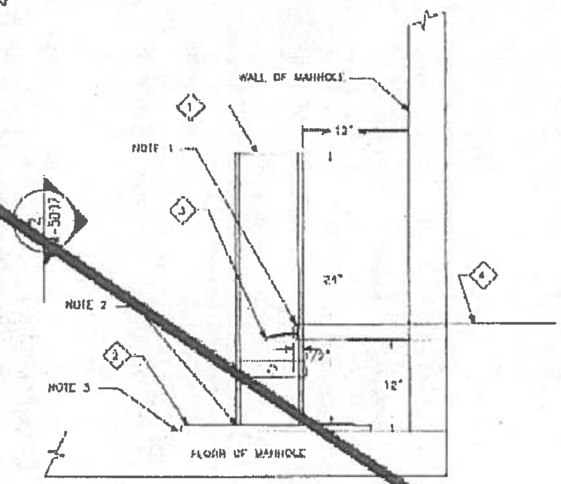
GENERAL NOTES:

1. DETAILS ARE TYPICAL. VARIATIONS DUE TO EQUIPMENT CO... ARE ALLOWABLE.
2. FOR INSTRUMENT INDEX AND BILL OF MATERIALS ... DWG. ...

HOLD M-001

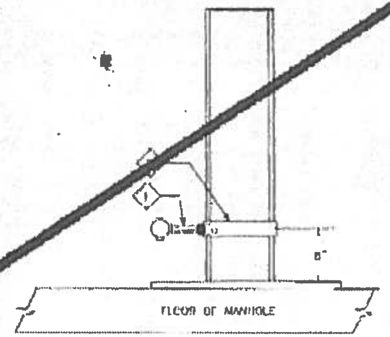


PART	QTY.	DESCRIPTION
1	1	4" SCHEDULE 40 PVC OR HDPE DR17 PIPE
2	1	12"X12"X1/2" THICK PVC SHEET
3	1	1/4" TEFLON TUBE CUT TO LEAVE 2" EXPOSED (BY MECHANICAL CONTRACTOR)
4	1	2" HDPE DR17 OR PVC SCHEDULE 40 PIPE (BY MECHANICAL CONTRACTOR)

NOTES:

1. DRILL HOLE IN 4" PVC PIPE TO MATCH OD OF 2" PIPE. INSERT 2" PIPE THROUGH HOLE AND SEAL WITH PVC SOLVENT GLUE.
2. ATTACH PVC PIPE TO SHEET USING PVC SOLVENT GLUE.
3. ATTACH PVC SHEET TO FLOOR OF MANHOLE USING CONSTRUCTION ADHESIVE.

1 M-5000 LEAK DETECTION STANDPIPE
SCALE: NONE



PART	QTY.	DESCRIPTION
1	1	LEVEL SWITCH - DWYER, W.E. ANDERSON FLOTECT MODEL LSCPS-S-3-0 JCTUN
2	1	PVC OR HDPE PIPE SADDLE CLAMP FOR 4" SCHEDULE 40 PIPE, 1" NPT OUTLET

2 M-5000 LEAK DETECTION LEVEL SWITCH
SCALE: NONE

Not Used For Construction

HOLDS:

M-001 LEAK DETECTION SYSTEM

NO.	DATE	CLASS REV	APPD	DESCRIPTION	DWN	DSGN

ZERO LIQUID DISCHARGE SUBPROJECT

LEAK DETECTION LEVEL SWITCH INSTRUMENT INSTALLATION DETAILS

BLDG 181,183 TA-52

Los Alamos NATIONAL LABORATORY
PO Box 1663 Los Alamos, New Mexico 87545

M-5
G

PROJECT ID 100761
DRAWING NO C-55751

12929

CCW: Matters for discussion on April 16, 2015

1. Electronic Public Reading Room: documents to be posted (Condition 1).
2. Signage; entry restrictions (Conditions 5, 6).
3. Water tightness testing (Condition 8); double-lining of pipe.
4. Settled solids; removal from SET, MES (Condition 9).
5. Maintenance and repair (Condition 11).
6. Emergency Response Procedures (Condition 16).
7. Installation and calibration of flow meters (Conditions 17, 18).
8. Waste tracking (Condition 24).
9. Soil monitoring (Condition 26).
10. Ground water flow and monitoring (Conditions 27, 28, 29 and 37).
11. Settled solids removal (Condition 32).
12. Effluent exceedence (Condition 35).
13. Soil moisture exceedence (Condition 36).
14. Stabilization of individual units and systems (Condition 43).
15. Closure plan (Condition 44).
16. Request for air monitoring of MES, SET.
17. Technical questions about SET and MES submitted by email to Applicants.

CCW: Matters for discussion on April 16, 2015

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14. Stabilization of individual units and systems (Condition 43).
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16. Request for air monitoring of MES, SET.
17. Technical questions about SET and MES submitted by email to Applicants.

: 12932

Communities For Clean Water

March 17, 2015

Steve Huddleson, Environmental Scientist
Ground Water Quality Bureau
New Mexico Environment Department
P. O. Box 5469
Santa Fe, NM 87502-5469
By Hand Delivery

Re: Today's DP-1132 Meeting between NMED and the Applicants (DOE/LANL/LANS), with Attendance from the Attorneys involved in U.S. DOE v. Flynn, Case No. 10cv1251 MCA/WPL

Dear Mr. Huddleson:

The Communities for Clean Water ("CCW"), Robert H. Gilkeson and J. Gilbert Sanchez understand that today's meeting at the New Mexico Environment Department ("NMED") is between the Department and the Applicants, the Department of Energy ("DOE"), Los Alamos National Laboratory ("LANL"), and Los Alamos National Security, LLC ("LANS") regarding the draft Discharge Permit 1132 ("DP-1132"). By email from Ms. Jennifer Hower on February 17, 2015, CCW, Gilkeson and Sanchez were more than welcome to attend today's meeting.

CCW is a network of organizations whose mission is to ensure that community waters that LANL has an impact upon are kept safe for drinking, agriculture, sacred ceremonies, and a sustainable future. Our growing network includes Concerned Citizens for Nuclear Safety, Amigos Bravos, Honor Our Pueblo Existence, the New Mexico Acequia Association, the Partnership for Earth Spirituality, and Tewa Women United. CCW brings together the vast expertise and commitment of widely respected and well-tested advocacy groups from culturally diverse backgrounds.

Collectively CCW represents the only community-based coalition in Northern New Mexico that has been monitoring and advocating for better public water policy to address the toxic threats from LANL. As the sacred homeland of the Pueblo Peoples, it is vitally important that clean water be protected on the Pajarito Plateau. CCW has been working as a coalition to address contaminated water from LANL and Los Alamos County since 2006.

We will be attendance to listen and add to the discussion, if appropriate. CCW is not prepared to make any agreements today.

As members of the public and commenters to the draft DP-1132, CCW, Gilkeson and Sanchez are not endorsing today's meeting. We are thoroughly involved in the draft DP-1132 administrative public process, have provided extensive public comments on the various drafts of the DP, and have requested a public hearing.

We note that there are commenters, such as Nuclear Watch New Mexico, who also provided comments and a request for a public hearing, who have not been invited to participate in the on-going discussions and reviews of various draft permits.

We look forward to the scheduled April 16, 2015 meeting between the Department, the Applicants and CCW, Gilkeson and Sanchez to discuss our concerns with the latest draft of the DP-1132.

Sincerely,

For CCW, Gilkeson and Sanchez

Rachel Conn
Amigos Bravos

12935

3-12-15

DP-1132 Sign in Sheet

Name	Affiliation	email	Phone
Steve Huddleson	NMED	steven.huddleson@state.nm.us	827-293
Jennifer Hower	NMED	jennifer.hower@state.nm.us	222-9550
Rachel Conn	Amigos Bravos / CCW	rconn@amigosbravos.org	
Marlene Perrotte	Partnership for Earth Spirituality / CCW	marlenep@swcp.com	
[illegible]	NMELC	jblodgett@nmelc.org	989-9022 ext 2
Kathy Sanchez	CCW-Tewa Women United	Kathy@tewawomenunited.org	
Mikki Anaya	Tewa Women United	" "	
BOB BEERS	LANS	bbeers@lanl.gov	667-7969
William C Scott	"	bscott@modrall.com	848-1824
Susan McMichael	" "	smcmichael@lanl.gov	667-3466
PETE MAGGIORE	NA-LA/EPO	Peter.Maggiore@nnsa.doe.gov	505-665-502
Lisa Cummings	" / Counsel	lisa.cummings@nnsa.doe.gov	505-665-9172
Trais Kliphuis	NMED	trais.kliphuis@state.nm.us	827-175
Mike Saladen	LANS	Saladen@LANL.GOV	665-608
Eric Trujillo	NNSA-APM	Eric.Trujillo@nnsa.doe.gov	665-5914
Alison Dorries	LANS	adorries@lanl.gov	665-6952
GENE TURNER	NNSA	gene.turner@nnsa.doe.gov	667-5794
CHRIS DEL SIGNORE	LANS	JCDS@LANL.GOV	665-5956
Kathryn Hayden	NMED	kathryn.hayden@state.nm.us	827-1046

12936

11:00

Abraham - Bahe Consultants

3-17-15 0800 arrive
DP1132 Prep

Angie Curry DOJ -
Joi Arends CCWS -
Maria Naranjo CCW
Eileen McDunny - DOJ
- J.H.
intent of meeting - resolve
outstanding issues

Bill Scott
Concerns -
1) • too many items to be posted - Scattered
consolidate to central conditions -
• Postings to be voluntary - ambiguous -
is annual voluntary & remainder
appear to be mandatory Shall
• prefer single conditions

'tans

-propose Substantive rather than procedura
- 6a1, 6a2, 6a8, 6a9, 6A12, 6A17, 6B20, 6B26, 6B27, 6D44, 6D45, 6D46, 6D47,

- Wast Tracking
page 24 para 24
waste streams to or from
- why is this required ~~from~~ as part of Discharge Permit - regulatory authority under statutes or regulations
- Stand by this
J.H. re: authority - out of RCRA process =
LANS will propose language
Joni - asked for list - lab provided
- applicant proposed reduced list
• Condition 6B36
Soil moisture - Detection

- McMichael
Char 43 g new language
44 d
Concerns with language
- new language is duplicative and potentially in conflict w/ consent accord

ttered
-
ors-
-

12938

is this in conflict with
Settlement agreement & consent
order?
Cant agree with language

J.H. DP separate under-
consent order, DP & closure even
under DP - language perhaps
would be changed to poin to
consent order.

J.Bo if list made of spec
items-

JA. Could LANL provide
lists SMU @ TA-50

Jon Block - Jon! had to
leave -
• CCNS would prefer to discuss
~~Or iss~~ add'tl issues on April 17
- Jon will send a list on April 2

R.Conn -
CCW Amigos Bravos - further o
April 17 -
- posting response - mandatory requirem
for all 43 items-

Closure Plan - must be included in Draft Permit - have been Consistent in requesting this
- going back to 2013 comments -
- DOE & LANL have had ample time to develop closure plan -

(-1? expected)

-

Kathy Sanchez

Outfall 51 no signs @ outfall have been working on signage - with visual
- concern that there be appropriate postings - request @ out fall

2.9/4

10:45 meeting over
review J.P. notes - Draft orphan list

3-18-15

0900 Process improvement
- Scanning ?
  - active files
  - expired files &
  - monitoring files -
- Consultant
- borrow resources

Huddleson, Steven, NMENV

From: Beers, Bob <bbeers@lanl.gov>
Sent: Monday, March 16, 2015 4:01 PM
To: Huddleson, Steven, NMENV
Cc: Saladen, Michael Thomas; McMichael, Susan Lynn; Turner, Gene E; Bill C. Scott; Cummings, Lisa K; Dorries, Alison Marie; Del Signore, Chris
Subject: FW: Agenda for tuesday meeting

Steve,

Below is a list of items that DOE/LANS would like to place on the agenda for tomorrow's meeting.

Regards,

Bob Beers
Los Alamos National Security, LLC
505-667-7969

Page #	Description	Remaining Issues: Revised Draft Permit DP-1132 (2/20/15 version)
11	Posting to EPRR	The revised draft permit lists 43 required postings to the EPRR which are scattered throughout the permit. In the Decem NMED, DOE/LANS proposed a new condition, *Public Involvement*, that commits to 13 postings and removes any pena posting requirements.
26	No. 24 Waste Tracking	The Waste Tracking condition is unacceptable due to the following requirement: "*The Permittees shall maintain written or electronic records of all wastestreams conveyed to or <u>from the Facilit</u>* This requirement subjects all non-liquid waste removed *"from"* the facility to regulation by the discharge permit from the RLWTF is outside the jurisdiction of the New Mexico Water Quality Act. The disposal of radioactive n Department of Energy
37	No. 36 Soil Moisture Detection System Exceedance	In response to CCW's request, NMED changed the time allotted for the Permittee to submit a corrective action plan foll action level from 120 days to 30 days. Condition No. 36(b)—submittal of a source proposal plan within 60 days—is in c
42	No. 42 Stabilization of Units	The requirement to identify in a workplan "*characterization activities to be taken*" during the stabilization of units does Compliance Order on Consent (Consent Order) as the sole authority for environmental characterization, investigation, a
43	No. 43 Closure Plan	The requirement in the Closure Plan to submit a work plan for NMED approval that requires investigation and characteriz groundwater from the facility, system and units is addressed under NMED's Hazardous Waste Act, and the Consent Orde

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From: Huddleson, Steven, NMENV [mailto:Steven.Huddleson@state.nm.us]
Sent: Friday, March 13, 2015 2:00 PM
To: Joni Arends; Beers, Bob
Cc: Hower, Jennifer, NMENV
Subject: Agenda for tuesday meeting

Please send for consideration specific items you would like to place on the agenda relative to DP-1132 for Tuesdays meeting. Attached are the comments from the December Draft.

AGENDA

March 17, 2015

DP-1132

9:00 Jennifer Hower – Guidelines for Meeting

LANL Issues

- Posting to Public Reading Room
- Waste Tracking Requirements
- Corrective Action Plan Submittal Timelines
- Characterization Requirement for Stabilization of Units
- Closure Plan – Workplan requirement

CCW Issues

- Posting to Public Reading Room
- Tightness Testing Frequency
- Emergency Plan
- Moisture Monitoring SET
- Closure Plan

BRVLV

Next Meeting – Resolution of Issues

: 12965

Page #	Condition No.	Current Language	Proposed Change
9	V.C	*Solar Evaporative Tank system*	*Solar Evaporative Tank S~~s~~ystem*
12	3	*…design or capacity for any of the system, units or components…*	*…design or capacity for any of the systems, units or components…*
12	3	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, LANL.*	*If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, the Permittees ~~LANL~~.*
14	4	*A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes;*	*A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specifications made during construction (based on field concerns and changes);*
15	6	*Authorized Personnel only*	*Authorized Personnel Only*
17	9	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average volume greater than one foot. In the event that settled solids volumes exceed the volumes defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*	*The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average depth ~~volume~~ greater than one foot. In the event that settled solids depth ~~volumes~~ exceed the ~~volumes~~ depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit.*
20	Table 1	Xylenes (total) (total)	Xylenes (total) ~~(total)~~
20	Table 1	Total Nitrogen (sum of TKN+NO_3-N) (total)	Total Nitrogen (sum of TKN (total) +NO_3-N (dissolved)) ~~(total)~~ Basis: Table 2 and Condition No. 14.d identify NO3-N as "dissolved" which is consistent with the regulations (20.6.2.3103 NMAC).
21	14.d	No_3-N	NO~~o~~$_3$-N
21	14.d	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for No_3-N shall apply for discharges to Outfall 051:*	*Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for NO_3-N shall apply for discharges to the SET and MES ~~Outfall 051~~:*
23	16	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than annual triennial basis or in the event the plan fails during an emergency,*	*The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~annual~~ triennial basis or in the event the plan fails during an emergency,*
30	28	*Within 90 days of the effective date of this discharge plan, permittees will submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*	*Within 90 days of the effective date of this D~~d~~ischarge ~~plan~~ Permit(by DATE), the P~~p~~ermittees ~~will~~ shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051.*

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36	35.c	*c. Increase the frequency of effluent sampling to adequately establish quality of all discharges by batch.*	*c. Increase the frequency of effluent sampling to adequately establish the quality of ~~all~~ discharges ~~by batch~~, prior to resuming discharges to the system with the exceedance.* Basis: Condition 35.a requires ceasing discharges. As currently written there is not a path to resumption.

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42	42	*(Condition 42)*	*(Condition ~~42~~ 43)*
42	43	*(Condition 43)*	*(Condition ~~43~~ 44)*
42	43.e	*Identification of those portions of the approved Closure Plan*	*Identification of those portions of the ~~approved~~ submitted Closure Plan.* Basis: Per Condition No. 44, the *Closure Plan* is submitted at 180 days which is the same period as the *Stabilization Plan* (120 days for *Stabilization Plan* after cessation period of 60 days). Therefore, no time is available for NMED approval.

12969

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12970

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Typographical Errors and Minor Editorial Comments, Revised Draft Discharge Permit DP-1132 (Version 12/15/2014)
U.S Department of Energy and Los Alamos National Security, LLC

LA-UR-14-29705

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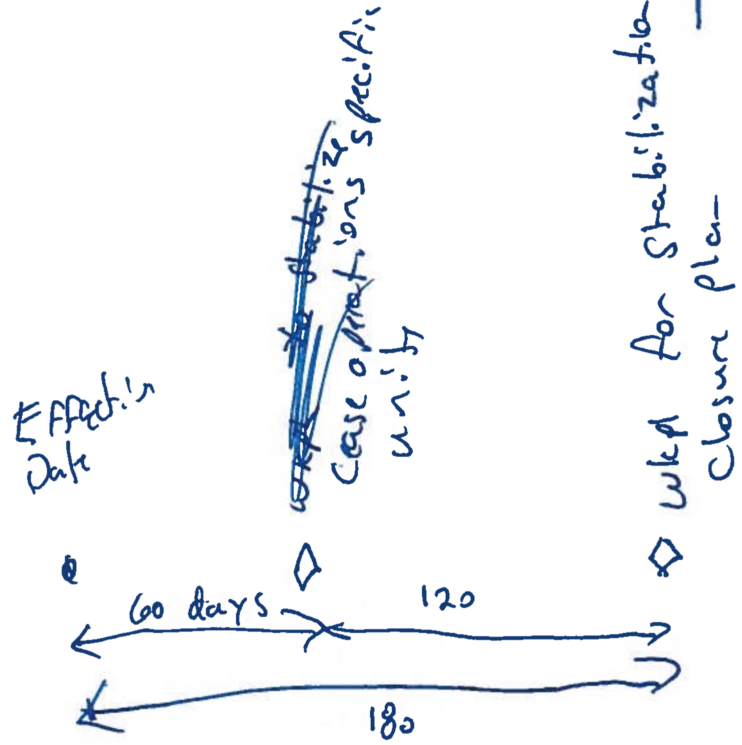
42	43	*(Condition 43)*	*(Condition ~~43~~ 44)*
42	43.e	*Identification of those portions of the approved Closure Plan*	*Identification of those portions of the ~~approved~~ submitted Closure Plan.* <u>Basis</u>: Per Condition No. 44, the *Closure Plan* is submitted at 180 days which is the same period as the *Stabilization Plan* (120 days for *Stabilization Plan* after cessation period of 60 days). Therefore, no time is available for NMED approval.



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Los Alamos
NATIONAL LABORATORY
EST 1943

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
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Los Alamos, New Mexico 87545
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National Nuclear Security Administration
Los Alamos Field Office, A316
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(505) 667-5794/Fax (505) 667-5948

Date: APR 2 3 2015
Symbol: ENV-DO-15-0104
LA-UR: 15-22570
Locates Action No.: *NA*

Ms. Phyllis Bustamante, Acting Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

GROUND WATER
APR 2 4 2015
BUREAU

Dear Ms. Bustamante:

Subject: Discharge Plan DP-1132 Quarterly Report, First Quarter 2015, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the first quarter 2015 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the first quarter of 2015, no effluent was discharged to either the National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at Technical Area (TA)-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells
No samples were collected from Mortandad Canyon alluvial wells MCO-4B, MCO-6, and MCO-7 during the first quarter of 2015 because there was insufficient water in these wells for sampling. No sample was collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Detailed information on the condition of MCO-3 was submitted to the NMED in December 2013 (ENV-DO-13-0316). Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the first quarter of 2015 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the first quarter of 2015 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:RSB/lm

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Hai Shen, EM-SG, (E-File)
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ENV-DO-25-0137 LA-UR-15-23614

DRAFT GROUND WATER DISCHARGE PERMIT (DP-1132)
RADIOACTIVE LIQUID WASTE TREATMENT FACILITY
LOS ALAMOS NATIONAL LABORATORY

Table of Contents

I. ACRONYMS:

The following acronyms and abbreviations may be used throughout this Discharge Permit:

- BOD_5-biochemical oxygen demand (5-day)
- CAS-Chemical Abstract Service
- CFR-Code of Federal Regulations
- Cl- chloride
- CQCAP- Construction Quality Control Assurance Plan
- DOE-United States Department of Energy
- EPA- United States Environmental Protection Agency
- gpd-gallons per day
- LANL-Los Alamos National Laboratory
- LANS- Los Alamos National Security, LLC
- MES-Mechanical Evaporator System
- Mg/L-milligrams per liter (or parts per million)
- NMAC-New Mexico Administrative Code
- NMSA-New Mexico Statues Annotated
- NO_3-N-nitrate-nitrogen
- NPDES-National Pollutant Discharge Elimination System
- PCBs-Polychlorinated Biphenyls
- QA/QC-Quality Assurance/Quality Control
- RLW-Low-level radioactive waste water
- RLWTF-Radioactive Liquid Waste Treatment Facility
- SET-Solar Evaporative Tank System
- TA-Technical Area
- TDS-total dissolved solids
- TKN-total Kjeldahl nitrogen
- TRU-Transuranic
- TSS-total suspended solids
- WQA-Water Quality Act
- WQCC-Water Quality Control Commission

II. DEFINITIONS:

The following is a list of definitions as they pertain specifically to this Discharge Permit:

A. **Average daily flow**- the rate determined by dividing the total monthly volume by the number of days for the reporting period.

B. **Active portion**- the portion of the Facility where treatment, storage or disposal of waste water occurs or has occurred in the past, including those portions of the Facility which are not in use and have not been closed in accordance with the conditions in this Discharge Permit.

C. **Calibration** – a comparison between an instrument of known magnitude or correctness (standard) and another measurement made in as similar a way as possible with a second device (test instrument).

D. **Closure**- to permanently discontinue the use of a unit, system, or component of the Facility (partial) or the entire Facility (final).

E. **Construction Quality Control Assurance Plan**- a written plan of activities necessary to ensure that construction and installation meet design criteria. A CQCAP includes practices and procedures for inspections, testing and evaluations of material and workmanship necessary to verify the quality of the constructed unit or system, and corrective actions to be implemented when necessary.

F. **Discharge**- the intentional or unintentional release of an effluent or leachate which may move directly or indirectly into ground water or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property.

G. **Effluent**- a liquid waste product resulting from the treatment or partial treatment of an influent waste stream intended to be discharged.

H. **Exfiltration**- the uncontrolled passage or penetration of waste water or sludge from a structural component of a unit or system through defective pipes, pipe joints, connections, cracks, structural failure, or material incompatibility and enters the surrounding environment.

I. **Flow meter**- a quantitative instrument or device that measures, displays, and records the flow of a fluid in a conduit or an open channel.

J. **Freeboard**-the vertical distance between the crest of the embankment and the carrying capacity level of an open tank, impoundment, or other open unit that contains a liquid or semi-liquid

K. **Impoundment**- a unit which is a natural topographic depression, man-made excavation, or diked area primarily constructed of earthen materials, specifically designed to hold, evaporate or store, an accumulation of liquid or semi-liquid waste.

L. **Industrial waste water**- the liquid wastes from industrial processes or non-household waste water which is generated through activity not solely derived from human excreta, residential sinks, showers, baths, clothes and dish-washing machines; or exceeds the characteristics of a domestic waste as defined in 20.7.3.7.D(6) NMAC; 300 mg/L BOD, 300 mg/L TSS, 80 mg/L total nitrogen or 105 mg/L fats, oils and grease.

M. **Infiltration**- the uncontrolled passage or penetration of liquids or semi-liquids into a unit or system through defective pipes, pipe joints or connections, or manhole walls. cracks, structural failure, or material incompatibility.

N. **Influent collection system**- the infrastructure and associated components (e.g.

sumps, pumps) used for the collection and conveyance of waste water from the originator to the Facility's treatment systems.

O. **Influent-** untreated water, waste water or other liquid or semi-liquid flowing into a reservoir, basin, or treatment plant.

P. **Leak detection system-** a system capable of detecting the failure of either the primary or secondary containment structure or the presence or release of an accumulated liquid in the secondary containment structure. The system must employ operational controls or consist of an interstitial monitoring device designed to detect continuously and automatically the failure of the primary or secondary containment structure or the presence of a release into the secondary containment structure.

Q. **Maintenance and repair-** all actions associated with keeping a system or component functioning as designed or restoring a system or component to its intended function. Maintenance and repair does not include alterations to a unit or system which change the intended function or design of the unit or alter the treatment process.

R. **Maximum daily discharge-** the total daily volume of waste water (expressed in gallons per day) authorized for discharge by a discharge permit.

S. **Open unit or system-** a unit or system designed to store, treat or dispose of liquids, semi-liquids or solids to which the uppermost portion of the unit is exposed.

T. **Outfall-** the point where a treated waste water discharges to waters of the United States, or a tributary to waters of the United States.

U. **Peak instantaneous flow-** the highest design flow rate for a unit or system, expressed in gallons per minute or cubic feet per second.

V. **Record drawings-** the official record of the actual as-built conditions of the completed construction, to be held as the permanent record of each unit and system, which shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

W. **Secondary containment-** a constructed unit or system designed to prevent any migration of waste streams or accumulated liquid out of the unit or system to the soil, ground water, or surface water at any time. Secondary containment can include, but is not limited to: double-walled pipes, concrete and floors equipped with sumps and alarm systems to detect potential leaks and must be:
- Designed, constructed and maintained to surround the unit on sides and bottom;
- Free of cracks, gaps, or fissures;
- Constructed of, or lined with, materials that are compatible with the waste streams to be in contact with the unit or system;
- Placed on a foundation or base capable of withstanding pressure gradients, settling or uplift which may cause failure of the unit or system; and
- Equipped with a leak detection system that is designed and operated so that it will detect the failure of the primary containment structure;

X. **Settled solids measurement device-** an apparatus for testing settled solids in a liquid suspension for settling rate, compaction of the settled solids, and the resulting clarity of the liquid.

Y. **Sludge or settled solids-** a solid or semisolid residue that results from the treatment or precipitation of solids from a waste stream, or the accumulation of natural sediment and debris settling in an open unit or system.

Z. **Synthetic Liner-** a continuous layer of man-made materials, beneath or on the sides of a unit or system, which restricts the downward or lateral escape of effluent or leachate.

AA. Tank- a stationary device, designed to contain an accumulation of waste water which is constructed primarily of non-earthen materials (e.g., concrete, steel, plastic) which provide structural support. Tanks can be further identified as either an **On ground tank** meaning a tank that is situated in such a way that the bottom of the tank is on the same level as the adjacent surrounding surface allowing for visual inspection of the vertical walls but not the external tank bottom, an **In-ground tank** meaning a tank constructed or installed so that a portion of the tank wall is situated to any degree within the ground, thereby preventing visual inspection of that portion of the external surface area, or an **Aboveground tank** meaning a tank that is completely elevated above the adjacent surrounding surface allowing for visual inspection of the vertical walls and external tank bottom.

BB. Total Nitrogen- The sum of total Kjeldahl nitrogen (TKN) and nitrate-nitrogen (NO_3-N).

CC. Toxic Pollutant- a water contaminant or combination of water contaminants in concentration(s) which, upon exposure, ingestion, or assimilation either directly from the environment or indirectly by ingestion through food chains, will unreasonably threaten to injure human health, or the health of animals or plants which are commonly hatched, bred, cultivated or protected for use by man for food or economic benefit; as used in this definition injuries to health include death, histopathologic change, clinical symptoms of disease, behavioral abnormalities, genetic mutation, physiological malfunctions or physical deformations in such organisms or their offspring; in order to be considered a toxic pollutant a contaminant must be one or a combination of the potential toxic pollutants identified in the list in 20.6.2.7.WW NMAC and be at a concentration shown by scientific information currently available to the public to have potential for causing one or more of the effects listed above; any water contaminant or combination of the water contaminants identified in the list in 20.6.2.7.WW NMAC creating a lifetime risk of more than one cancer per 100,000 exposed persons is a toxic pollutant.

DD. Treatment- any method, technique or process that, through chemical biological and mechanical processes, modify waste water characteristics with the objective to neutralize and reduce or remove organic and inorganic water contaminants which if released to the environment could potentially impact ground water quality or pose a threat to human health.

EE. Unauthorized Release or spill- the intentional or unintentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil or other water contaminant not authorized in this Discharge Permit.

FF. Water Contaminant - any substance that could alter if discharged or spilled the physical, chemical, biological or radiological qualities of water; "water contaminant" does not mean source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954.

III. Introduction

The New Mexico Environment Department (NMED) issues this Discharge Permit (Discharge Permit), DP-1132, to the United States Department of Energy (DOE) and to Los Alamos National Security, LLC (LANS) (collectively the Permittees) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge, and potential release, of water contaminants from the Los Alamos National Laboratory~~'s~~ (LANL~~'s~~) Radioactive Liquid Waste Treatment Facility (Facility) so as to protect public health, ground water for present and potential future use as a domestic water supply or an agricultural water supply, and those segments of surface water gaining from ground water inflow. In issuing this Discharge Permit, NMED has determined that the requirements of 20.6.2.3109.C NMAC have been or will be met.

The application (i.e., discharge plan) consists of the materials submitted by the Permittees on August 19, 1996, an updated application submitted to NMED on February 16, 2012, an amendment to the application submitted to NMED on August 10, 2012, and materials contained in the administrative record prior to issuance of this Discharge Permit.

The Facility is located within Los Alamos National Laboratory, approximately 1.5 miles south of Los Alamos, New Mexico, in Sections 16, 17, 20, 21 and 22, Township 19N, Range 06E, Los Alamos County. Ground water most likely to be affected ranges from depths of approximately one foot to 1,306 feet and has a total dissolved solids concentration ranging from approximately 162 to 255 milligrams per liter.

The Facility, as it pertains to conditions within this Discharge Permit (DP-1132), is a wastewater treatment facility that is authorized to discharge up to 40,000 gallons per day (gpd), specifically described in section V(D) of this Discharge Permit and includes the influent collection system, the low-level radioactive liquid waste treatment system, the transuranic waste water treatment system, the secondary treatment system, the Mechanical Evaporator System (MES), the Solar Evaporative Tank System (SET) and an outfall (Outfall 051) also regulated by a National Pollutant Discharge Elimination System (NPDES) permit issued by the United States Environmental Protection Agency (EPA) pursuant to the federal Clean Water Act Section 402, 33 U.S.C § 1342. The discharge may contain water contaminants with concentrations above the standards of 20.6.2.3103 NMAC and may contain toxic pollutants as defined in 20.6.2.7.WW NMAC.

Pursuant to 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or that the standards of 20.6.2.3103 NMAC are being or may be violated or a toxic pollutant as defined in 20.6.2.7.WW NMAC is present. Such modifications may include, without limitation, the implementation of structural controls, treatment processes, monitoring criteria, operational processes, changes in discharge

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activities and the abatement of water pollution and remediation of ground water quality.

Issuance of this Discharge Permit does not relieve the Permittees of the responsibility to comply with the WQA, WQCC Regulations, and all other applicable federal, state, and local laws and regulations.

IV. Findings

In issuing this Discharge Permit, NMED finds:

A. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.

B. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of total dissolved solids (TDS) within the meaning of 20.6.2.3101.A NMAC.

C. The discharge from the Facility is within or into a place of withdrawal of ground water for present or reasonably foreseeable future use within the meaning of the WQA, NMSA 1978, § 74-6-5.E.3, and the WQCC Regulations at 20.6.2.3103 NMAC

D. The discharge from the Facility to Outfall 051 is subject to the exemption set forth in 20.6.2.3105.F NMAC, to the extent that effective and enforceable effluent limitations (not including monitoring requirements) are imposed, unless the NMED Secretary determines that a hazard to public health may result.

V. Authorization to Discharge

A. Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the Permittees to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

B. The Permittees are authorized to discharge up to 40,000 gpd of low-level and transuranic radioactive industrial waste water using a series of treatment processes as described in Section V(D) of this Discharge Permit in accordance with the Conditions set forth in Section VI of this Discharge Permit.

C. The Permittees are authorized to discharge up to 40,000 gpd of treated waste water, in accordance with the Conditions set forth in Section VI of this Discharge Permit. Discharges shall be to either the Mechanical Evaporator System (MES), the synthetically lined Solar Evaporative Tank Ssystem (SET), or through an outfall (identified as Outfall 051) also regulated by a National Pollutant Discharge Elimination System (NPDES) permit (Permit No. NM0028355) issued by the United States Environmental Protection Agency [20.6.2.3104 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC].

D. The Permittees are authorized to use the following defined systems with their associated units for the process of treating and disposing of waste water:

The Influent Collection System is defined herein as all primary and secondary containment lines that convey transuranic or low-level radioactive waste water from Technical Areas TA-03, TA-35, TA-48, TA-50, TA-55, and TA-59 to the Transuranic Waste (TRU) treatment system and the Low-level Radioactive waste water (RLW) treatment system at TA-50. It includes the conveyance lines beginning at the point the pipe emerges from the building or other structure that comprises the site of generation, and extending to the vault immediately upstream of the influent tanks at TA-50. It also includes the conveyance of low-level radioactive waste water to the RLW treatment system by truck.

The Low-level Radioactive Waste W~~w~~ater (RLW) Treatment System is defined herein as the low-level radioactive waste water influent storage tanks, the associated treatment units (filters, feed tanks, ion exchange columns, reverse osmosis units, etc.) effluent storage tanks, and other associated low-level radioactive waste water components at TA-50. The process by which the individual treatment units within the low-level radioactive treatment system are utilized may, for attaining compliance with the effluent limits set forth in this Discharge Permit, be altered, by-passed, replaced, or removed in accordance with the Conditions set forth in this Discharge Permit. The physical location of each unit and system that conveys, stores, or treats RLW waste streams coming into the low-level radioactive waste water treatment system is within TA-50.

The Transuranic (TRU) Waste Water Treatment System is defined herein as the influent storage tanks for each form of TRU (acidic and caustic) wastestreams, the associated neutralization unit, pressure filters, the final processing tanks, and other associated TRU wastestream conveyance, storage and treatment components at TA-50. Sludge associated with TRU shall be disposed of at an off-site facility permitted to receive TRU waste.

The Secondary Treatment System is defined herein as the receiving tanks for reverse osmosis concentrate waste water generated through the RLW Treatment System and treated effluent generated from the TRU Treatment System, the treatment process units for secondary reverse osmosis, the rotary vacuum filter, and other associated post-treatment conveyance, storage and treatment components at TA-50 designed to reduce wastestream volumes.

The Mechanical Evaporator System (MES) is defined herein as the units in which treated RLW effluent is disposed of through natural gas generated mechanical evaporation.

The Solar Evaporative Tank System (SET) is defined herein as the single concrete tank unit at TA-52 that receives treated effluent from the RLWTF, and the conveyance line from TA-50. The SET consists of two cells separated by a single partitioned wall; each cell has a containerized volume of approximately 380,000 gallons. The SET is an unsealed subgrade concrete structure with a ~~single~~ double-lined synthetic liner, and a leak detection system within the synthetic liner.

Outfall 051 is defined herein as the outfall through which treated waste water from the Facility is discharged to Effluent Canyon, which is a tributary to Mortandad Canyon.

[20.6.2.3104 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC].

VI. Conditions

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

A. Operational Plan

1. **ANNUAL UPDATE**-The Permittees shall submit to NMED ~~and shall post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ an updated Facility Process Description annually by February 1 of each year. ~~The posting of this information and other information as stipulated throughout this permit shall be voluntary, and as such, not enforceable under NMAC 20.6.2.1220.~~ The annual Facility Process Description shall include the following:
   a. A schematic of all major structures associated with the Facility, including all influent lines, buildings, exterior tanks, effluent lines, outfalls and discharge locations identified in this Discharge Permit.
   b. A comprehensive flow chart demonstrating the most current processes in operation for the collection, treatment and disposal of waste water for the Facility. The flow chart shall indicate any processes which have been by-passed, decommissioned, or are no longer used for the collection, treatment or final disposal of the waste water.
   c. An associated narrative describing each of the systems and treatment units outlined in the flow chart. This narrative shall include the collection system, primary treatment units, secondary treatment units and any systems used in the disposition of any associated waste streams at the Facility. For each unit or system, the narrative shall include:
      1) The identification of the unit or system;
      2) The physical location;
      3) Intended function;
      4) Physical description;
      5) Operational capacity, if applicable;
      6) The date the unit or system was placed in operation;
      7) Origin of waste streams that the unit or system receives; and
      8) The unit or system(s) to which it discharges.

   d. The Annual Update shall also include the following documents to be submitted annually by February 1 of each year.
      1) Summary of maintenance and repairs made during the reporting period;
      2) Water Tightness Testing results (VI.A.8);
      3) Settled Solids measurements (VI.A.9); and
      4) Ground Water Flow report (VI.A.2~~7~~6)

   [20.6.2.3106.C NMAC]

2. **NOTIFICATION OF CHANGES**-The Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at~~

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~~http://eprr.lanl.gov/oppie/service (or as updated)~~ a written notification of any changes in the Facility's collection, treatment or disposal systems which are not maintenance and repair (as defined in this permit Section II), and which are not significant modifications (covered in this permit Section VI.A.3). The notification shall be submitted no less than thirty days prior to the date proposed for implementation. The notification shall include, at a minimum, the following items listed herein and others which may be determined to be required by NMED:

a. Date process change is planned to be implemented;
b. Narrative of process change;
c. Justification for making the process change;
d. Units or components being removed from the process;
e. Units or components being incorporated into the process;
f. Operational controls implemented for the change in processes;
g. Intended duration of process change (e.g., permanent or limited duration).

LANL shall submit to NMED and add to the posting described in this Subsection any follow-up material required later by NMED, after NMED's review of a notification.
[20.6.2.3106.C NMAC]

3. **SUBMITTAL OF PLANS AND SPECIFICATIONS**-The Permittees shall not implement any expansion, process modification, or alteration of a system or unit that could constitute a discharge permit modification (as defined in 20.6.2.7.P NMAC) of the intended function, design or capacity for any of the systems, units or components of the Facility's collection, treatment or disposal systems without prior written approval by NMED. Prior to implementing any such changes, the Permittees shall submit to NMED for approval a written proposal, including plans and specifications that describes in detail the proposed changes in the processes or components of the Facility's collection, treatment, or disposal systems. The proposal shall be delivered by certified mail or hand delivery. The Permittees shall not place any waste in a new or changed unit or system unless the Permittees receive prior written approval from NMED. NMED will provide such approval only if it finds that the Permittees have submitted the required elements listed herein in sufficient detail to demonstrate that the unit or system is designed and constructed to minimize the possibility of an unauthorized release of water contaminants which could directly or indirectly impact ground water quality or pose a threat to human health. If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, Permittees ~~LANL~~.

The proposal shall include, at a minimum, the following information:

a. Identification of all applicable units and a description of how they will be constructed;
b. A map, to scale, of the Facility, with the location of the proposed unit relative to other identified structures or systems referenced in this

Discharge Permit;

c. Specifications for all new unit and system components (e.g., lift stations, valves, transfer lines, process units and associated details); whether new, retrofitted, or proposed for abandonment. All new system components for the collection, treatment or disposal of waste water at the Facility shall be designed to meet the projected needs of the Facility;
d. Plans and specifications for proposed flow meters that will be used to measure the volume of waste water discharged to or from the unit or system;
e. Demonstration that the proposed unit or system is adequately designed for its intended function;
f. Compatibility of the unit or system's constructed material with the proposed waste stream, including, if applicable, information regarding corrosion protection to ensure that it will maintain its structural integrity and not collapse, rupture or fail;
g. Certification that the foundation, structural support, seams, connections, and pressure controls, if applicable, are adequately designed and the unit or system has sufficient structural strength to convey, store, treat or dispose of the intended waste stream;
h. Certification for all plans and specifications attesting to the capacity of the unit or system including, without limitation, waste water flow data derived using both average daily flow and peak instantaneous flow. Computations should be presented in a tabular form showing depths and velocities at minimum, design average, and peak instantaneous flow for all new system components;
i. Water balance calculations for the capacity and evaporative potential for units which are subject to exposure to the environment and to which precipitation events may impact total capacity of the unit. The unit shall be designed such that two feet of freeboard or an NMED approved alternative is maintained at all times;
j. Design specifications for secondary containment for all units or systems intended to convey, store, treat, or dispose of liquid or semi-liquid waste streams;
k. Design specifications for leak detection systems associated with systems designed to convey, store, treat, or dispose of liquid or semi-liquid waste streams, which demonstrate the capability of detecting the failure of either primary or secondary containment or the presence of any release of any accumulated liquid in the secondary containment system within the earliest practicable time as approved in advance by NMED;
l. Proposed leakage tests shall be specified for all new unit or system components with direct contact to treated or untreated waste water. This may include appropriate water or low pressure air testing. The use of a camera or other visual methods used for documentation of the inspection, prior to placing the unit or system in service is recommended;
m. Design specifications for all units or systems designed to convey, store, treat, or dispose of liquid or semi-liquid waste streams, which demonstrate

the ability to remove liquids and semi-liquids from the area of containment within the earliest practicable time as approved in advance by NMED; and

n. A Construction Quality Control Assurance Plan (CQCAP) assuring that the proposed unit or system will meet or exceed all design criteria and specifications.

Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978) as well as applicable DOE and LANL Engineering Standards. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.1202 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

4. **CONSTRUCTION REPORT-**Within 90 days following completion of construction for a unit or system that requires NMED approval, the Permittees shall prepare a final construction report that contains the following:
   a. A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes);
   b. Description of the procedures and results from all inspection and tests that occur before, during, and after construction to ensure that the construction materials and the installed unit or system components meet the design specifications; and
   c. A complete copy of the Operation and Maintenance Manual, specific to the unit or system being constructed.

~~The Permittees' final construction report shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.1202 NMAC, 20.6.2.3109.C NMAC, 20.6.2.3106.C NMAC, 20.6.2.3107.C NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

5. **RESTRICTING ENTRY-**The Permittees shall, at all times, prevent the unauthorized entry of persons, wildlife, or livestock into the active portions of this Facility (with the exception of Outfall 051) so that physical contact with the waste streams, structures and equipment is restricted. Means to control unauthorized access shall include an artificial or natural barrier which completely surrounds the active portions of the Facility and a means to control entry, at all times, through gates or other entrances to the active portions of the

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Facility (e.g., locks, surveillance system).

[20.6.2.3109.C NMAC]

6. **SIGNS-**The permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the Facility. Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. Permittees shall include on the signs the following or an equivalent warning: DANGER – UNAUTHORZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS). The permittee shall post warning signs in the appropriate dialect of Towa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility and the Pueblo of San Ildefonso~~The Permittees shall post and maintain signs at each entrance to the active portions of the Facility (with the exception of Outfall 051) and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel oOnly. All signs shall be posted in English and Spanish and be legible from a distance of at least 25 feet~~.

[20.6.2.3109.C NMAC]

7. **VERIFICATION OF SECONDARY CONTAINMENT-**Within 180 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ verification demonstrating all units and systems intended to convey, store, treat or dispose of an untreated liquid or semi-liquid waste streams meet the requirements of secondary containment as defined in this Discharge Permit. Verification must also include certification of an operational leak detection system for the unit or system.

[20.6.2.3106.C NMAC, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

8. **WATER TIGHTNESS TESTING-**Within ~~540~~180 days following the effective date of this Discharge Permit (by DATE), and every 540 days thereafter, the Permittees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use. To make the demonstration, the Permittees shall conduct both a visual test, for those units and systems that are above-ground and visually inspectable, and a quantifiable test, as applicable.

For units and systems that are above-ground and visually inspectable, the visual assessment shall be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks and leaks. If necessary, the

Permittees shall remove the stored waste from the unit or system to allow the condition of internal surfaces to be assessed.

The quantifiable assessment for units and systems that are used to store, treat or dispose of liquid or semi-liquid waste streams shall consist of obtaining tank level measurements over at least a 36 hour period during which no liquid or semi-liquid is added to or removed from the unit. The exfiltration or infiltration rate shall not exceed 0.07 gallons per hour per thousand gallons of capacity for the unit or system.

The quantifiable assessment for units and systems designed to convey a liquid or semi-liquid waste stream shall be determined through passive testing for leakage exfiltration and infiltration. The infiltration or exfiltration rate shall not exceed 50 gallons per mile per consecutive 24 hour period for any section of the system. Infiltration and exfiltration tests for conveyance lines shall be conducted as follows:

a. Prior to testing for infiltration, the conveyance lines shall be isolated and evacuated so that maximum infiltration conditions exist at the time of testing. The Permittees shall measure and document the volume of infiltration entering each section of the conveyance line being tested. The cumulative results for the entire collection system shall not be a satisfactory method for gauging infiltration compliance.

b. Prior to testing for exfiltration, the conveyance lines shall be isolated and filled with water to a level that produces, at minimum, two feet of hydrologic head above the uppermost point of the section being tested. The cumulative results for the entire collection system shall not be a satisfactory method for gauging exfiltration compliance.

Demonstration of water tightness shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978). The Permittees shall submit to NMED~~, and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated),~~ the procedures and findings of the evaluation by February 1 of each year immediately following the date when the water tightness test was performed. In the event that inspection reveals that the criteria for leakage is greater than permissible in this Discharge Permit, the Permittees shall implement the requirements of Condition 9 (Actual or Threatened Water-Tightness Failure) ~~contingency plan set forth~~ in this Discharge Permit.

[20.6.2.3106.C NMAC, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

9. **ACTUAL OR POTENTIAL WATER-TIGHTNESS FAILURE**-In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the

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following actions:

a. If the unit or system failure resulted in an unauthorized release the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:.
   1) The Permittees shall remove the unit or system from service immediately; and
   2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.

If repair or replacement of a unit or system requires construction, the Permittees shall submit plans and specifications to NMED with the proposed corrective actions. Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

Upon NMED approval, the Permittees shall implement the approved corrective actions according to the approved schedule.

Prior to placing a repaired or replaced unit or system back into service, the Permittee shall repeat the water-tightness testing in accordance with Condition 8 to verify the effectiveness of the repair or replacement, and submit a report detailing the completion of the corrective actions to NMED. The report shall include the date of the test, the name of the individual that performed the test, written findings, photographic documentation of the unit's interior and water tightness test results. If notified to do so by NMED, the Permittees shall also submit record drawings that include the final, construction details of the unit. Record drawings shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]

~~9.~~10. **SETTLED SOLIDS; SETTLED SOLIDS REMOVAL**-The Permittees shall inspect and measure the thickness of the settled solids in the SET and MES (if applicable)~~,~~ on an annual basis for all open units and systems that are designed to store or dispose of a liquid or semi-liquid through evaporation. The Permittees shall measure the thickness of settled solids in accordance with the following procedure:

a. The total surface area of the unit or system shall be divided into nine equally sized areas.
b. A settled solids measurement device shall be utilized to obtain one settled solids thickness measurement (to the nearest half-foot) per area.
c. The individual settled solids depths for each of the nine measurement

areas shall be averaged.

The Permittees shall record all measurements in an inspection log which must include, at a minimum, the following:

a. Date and time of the inspection;
b. The name of the inspector;
c. Identification of the unit;
d. The location of the unit;
e. The estimated total volume of liquid or semi-liquid in the unit or system at the time of inspection;
f. The total depth capacity of the unit or system (allowing for ~~with respect to~~ freeboard requirements);
g. The method used to determine the settled solids depth; and
h. The average measured depth of settled solids in the unit.

The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average ~~volume~~ depth greater than one foot. In the event that the settled solids accumulation in an open unit or system exceeds an average depth of one foot, or in the event that the Permittees otherwise plan to initiate removal of settled solids from an open unit or system, the Permittees shall propose a plan for the removal and disposal of the settled solids from the unit or system. At least 120 days prior to any settled solids removal, the Permittees shall submit to NMED for approval a written settled solids removal and disposal plan. The plan shall include characterization of the settled solids, the estimated volume of settled solids to be removed, a method for removal throughout the unit or system in a manner that is protective of the structural integrity of the unit or system, a schedule for completing the settled solids removal and disposal, and a description of how the settled solids will be contained, transported, and disposed of in accordance with all local, state, and federal laws and regulations. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. ~~settled solids volumes depth exceeds the volumes depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit~~.

The Permittees shall keep the inspection log on site for a minimum of five years from the date of inspection. The Permittees shall submit a summary report of all settled solids depth results to NMED by February 1 of each year. ~~The Permittees' summary report shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.C NMAC, 20.6.2.3107.A NMAC]

~~10.~~11. **FACILITY INSPECTIONS-**The Permittees shall inspect the Facility for

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malfunctions, deterioration, leaks or spills which may be causing, or may lead to, an unauthorized release to the environment or pose a threat to human health.

The inspection shall be performed at the frequency prescribed for each unit or system in this Discharge Permit or based on the rate of deterioration of the equipment and the probability of an environmental or human health incident for those units and systems not specifically described herein.

a. The Permittees shall inspect and test all leak detection systems to ensure performance within manufacturer specifications on a monthly basis.
b. The Permittees shall inspect all externally observable portions of units and systems conveying, treating or storing liquids, semi-liquids, or solids including any secondary containment areas on a weekly basis. The Permittees shall examine for evidence of deterioration or failure of the units and systems. The visible portions of all synthetic liners used to store or dispose of liquids or semi-liquids shall be inspected for uniformity, damage, imperfections, punctures, blisters, and evidence of seam or joint failure on a monthly basis.
c. The Permittees shall inspect, on a weekly basis through indirect observation, all units and systems conveying, processing, or storing liquids, semi-liquids, or solids that are inaccessible or otherwise cannot be directly observed. The Permittees shall identify the unit or system and note any potential findings which may suggest a breach or failure of containment.
d. The Permittees shall inspect all open units and systems which contain a liquid or semi-liquid, on each day during which the Facility is in operation, to ensure capacity of the unit or system is not exceeded.

The Permittees shall record all inspections in an inspection log which shall be kept on site for a minimum of five years from the date of inspection. At a minimum, these inspections shall include the date and time of the inspection, the name of the inspector, identification of the unit, the location of the unit, the total volume of liquid or semi-liquid in the unit or system at the time of inspection, a notation of the observations made, and the date and nature of any maintenance and repairs made.

~~In the event that inspection findings reveal significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall implement the contingency plan set forth in this Discharge Permit.~~

[20.6.2.3107.A NMAC]

12. **CONTAINMENT-**The Permittees shall institute corrective actions, as necessary, to ensure the protection of ground water and human health. In the event that a unit or system or secondary containment for a unit or system

reveals damage that could result in structural failure or a release to the environment, the Permittees shall take the following actions:

a. The Permittees shall remove the unit or system from service immediately.

b. The Permittees shall take immediate, and if necessary temporary, corrective actions to minimize the potential for a release.

c. Within 90 days following identification of the potential failure, the Permittees shall submit to NMED for approval a written corrective action report to include, at minimum, the following:

1) Identification of the unit or system, or secondary containment for a unit or system in which the failure was observed.
2) The date and time the failure was observed and the date and time it was estimated to have begun.
3) The potential cause of the failure.
4) For units in which a release occurred to secondary containment but was not released to the environment, the rate at which the release occurred and total volume released to the secondary containment.
5) The characteristics of the waste stream being treated, stored or conveyed by the unit or system, with analytical results from waste stream samples taken with date, time, technical staff collecting the sample and the lab report with QA/QC.
6) The corrective actions taken to remediate the failure or release with a timeline of when actions were implemented.
7) Long-term actions, if any, that are proposed to be employed for maintaining the integrity of the secondary containment and the schedule for implementing such actions.
8) Ongoing measures for monitoring, inspecting, and determining structural integrity of the secondary containment.
9) Proposed operation and maintenance and repair protocol, if applicable, to be instituted to prevent future failures.

d. If failure of the unit or system or secondary containment resulted in a release to the environment, the Permittees shall comply with the requirements of Condition 38 (Spill or Unauthorized Release) of this Discharge Permit.

Upon NMED approval of the corrective action report, the Permittees shall implement any approved long-term actions to maintain the integrity of the secondary containment, and any other approved measures or protocols, according to the approved schedule.

[20.6.2.3107.A NMAC]

~~11.~~13. **MAINTENANCE and REPAIR**-The Permittees shall maintain the function and structural integrity of the Facility at all times except during maintenance or repair. All routine maintenance and repair actions shall be noted in a maintenance log which shall be kept on site for a minimum of five years. Maintenance and repair of a unit or system required due to potential

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malfunction which could lead to an unauthorized discharge to the environment or pose a threat to human health shall be corrected as soon as possible, but no later than 30 days from the date of the observed malfunction. For good cause, NMED may approve a longer period. The Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ a report which summarizes and describes the maintenance and repair activities performed on the Facility as part of the quarterly monitoring reports.

In the event that routine maintenance and repair reveal significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall implement the requirements of Condition 14 (Damage to Structural Integrity) of ~~contingency plan set forth in~~ this Discharge Permit.

[20.6.2.3107.A NMAC]

14. **DAMAGE TO STRUCTURAL INTEGRITY**-In the event that an inspection required in this Discharge Permit, or any other observation, reveals significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall notify NMED orally within 24 hours, and shall propose the repair or replacement of the treatment system or its associated components. Within 90 days after discovery by the Permittees or following notification from NMED that corrective action is required, the Permittees shall submit to NMED for approval a written corrective action plan that includes a schedule for implementation and completion. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees shall remedy any deterioration or malfunction of equipment or structures which are discovered during inspection.

[20.6.2.3107.A NMAC]

~~12.~~15. **FREEBOARD; FREEBOARD EXCEEDANCE**-The Permittees shall maintain two feet of freeboard in all open units and systems that contain a liquid or semi-liquid. If the Permittees determine that two feet of freeboard cannot be maintained, the Permittees shall submit to NMED for approval a written request for alternate freeboard requirements. In the request the Permittees shall, at a minimum, propose freeboard levels that will be maintained and propose demonstrated spill prevention controls and overfill prevention controls that include the prevention of overtopping by wave, wind or precipitation events. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

In the event that established freeboard of ~~is not maintained, the Permittees~~

~~shall implement the contingency plan set forth in this Discharge Permit.~~ two feet or an NMED approved alternative, is not maintained in an open tank, impoundment or other open unit or system that contains a liquid or semi-liquid, the Permittees shall take immediate corrective actions to restore the required freeboard.

In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the Permittees shall submit to NMED for approval a proposed corrective action plan to restore the required freeboard within 15 days following the date when exceedance of the required freeboard was initially discovered. The plan shall include a schedule for completion of corrective actions and quantifiable assessments to demonstrate preservation of the required freeboard for a period no less than five years. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B & .C NMAC]

~~13.~~16. **EFFLUENT LIMITS: OUTFALL 051**-The Permittees shall not discharge treated waste water to Outfall 051 that exceeds the following limits (or is outside the following pH range):

a. All water contaminants and their associated limits as listed in Table 1.

Table 1. Effluent Quality Limits for Discharges to Outfall 051

Inorganic Chemicals:	CAS#	mg/L
Aluminum (dissolved)	7429-90-5	5.0
Arsenic (dissolved)	7440-38-2	0.1
Barium (dissolved)	7440-39-3	1.0
Boron (dissolved)	7440-42-8	0.75
Cadmium (dissolved)	7440-43-9	0.01
Chromium (dissolved)	7440-47-3	0.05
Chloride (dissolved)	7647-14-5	250.0
Cobalt (dissolved)	7440-48-4	0.05
Copper (dissolved)	7440-50-8	1.0
Cyanide (dissolved)	57-12-5	0.2
Fluoride(dissolved)	16984-48-8	1.6
Iron (dissolved)	7439-89-6	1.0

Organic Chemicals:	CAS#	mg/L
Benzene (total)	71-43-2	0.01
Benzo (a) pyrene (total)	50-32-8	0.0007
Carbon tetrachloride (total)	56-23-5	0.01
Chloroform (total)	67-66-3	0.1
1,1-Dichloroethane (total)	75-34-3	0.025
1,2-Dichloroethane (total)	107-06-2	0.01
1-1-Dichloroethylene (total)	75-35-4	0.005
1,1,2,2-Tetrachloroethylene (PCE) (total)	127-18-4	0.02
1,1,2-Trichloroethylene (TCE) (total)	86-42-0	0.1
Ethylbenzene (total)	100-41-4	0.75
Ethylene dibromide (total)	1106-93-4	0.0001
Naphthalene plus monomethylnaphthalenes (total)	91-20-3, 90-12-0, 91-57-6	0.03

Lead (dissolved)	7439-92-1	0.05
Manganese (dissolved)	7439-96-5	0.2
Molybdenum (dissolved)	7439-98-7	1.0
Mercury (total)	92786-62-4	0.002
Nickel (dissolved)	7440-02-0	0.2
Perchlorate (total)	14797-73-0	0.0256
pH (total)		6 – 9
Selenium (dissolved)	7782-49-2	0.05
Silver (dissolved)	7440-22-4	0.05
Sulfate (dissolved)		600.0
Total Dissolved Solids (dissolved)		1000.0
Uranium (dissolved)	7440-61-1	0.03
Zinc (dissolved)	9029-97-4	10.0

Methylene chloride (total)	75-09-2	0.1
Total PCBs (total)		0.001
Phenols (total)	108-95-2	0.005
Toluene (total)	108-88-3	0.75
1,1,1-Trichloroethane(total)	74552-83-3	0.06
1,1,2-Trichloroethane (total)	79-00-5	0.01
1,1,2,2-Tetrachloroethane (total)	79-34-5	0.01
Vinyl Chloride (total)	75-01-4	0.001
Xylenes (total)~~(total)~~	108-38-3, 1330-20-7, 95-47-6, 106-42-3	0.62

Radioactivity:		**pCi/L**
Combined Radium-226 & Radium-228 (total)		30

Nitrogen Compounds:		**mg/L**
Total Nitrogen (sum of TKN+NO_3-N) (~~total~~dissolved)		15

b. Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051:
- Daily Maximum: 45 mg/L
- Quarterly average: 15 mg/L

c. For any water contaminant that is not listed in Table 1 of this Discharge Permit but is listed as a toxic pollutant in 20.6.2.7.WW NMAC, the limit shall be the concentration listed in Table A-1 of NMED, Risk Assessment Guidance for Site Investigation and Remediation (most recent edition and provided as Appendix 1). For any water contaminant that is not listed in Table 1 of this Discharge Permit or in Table A-1 of the Risk Assessment Guidance, the limit shall be the most recent EPA Regional Screening Level (RSL) for residential tap water. If an RSL is applicable for a carcinogenic water contaminant, the limit shall be adjusted to represent a lifetime risk of no more than one cancer occurrence per 100,000 persons (i.e., a cancer risk of 1 x 10^{-5}).

In the event that effluent limits are exceeded, the Permittees shall enact the requirements of Condition 18 (Effluent Exceedance) of ~~contingency plan set forth in~~ this Discharge Permit. Water contaminants that are subject to effective and enforceable limitations in NPDES Permit No. NM0028355 for discharges to Outfall 051 are exempt from the limits set forth in this

Condition.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

17. **EFFLUENT LIMITS: MES and SET**-The Permittees shall not discharge treated waste water to either the MES or SET that exceeds the following limits (or is outside the following pH range):

a) All water contaminants and their associated limits as listed in Table 2.

Table 2. Effluent Quality Limits for Discharges to the MES and SET

Inorganic Chemicals:	CAS#	mg/L
Aluminum (dissolved)	7429-90-5	5.0
Arsenic (dissolved)	7440-38-2	0.1
Barium (dissolved)	7440-39-3	2.0
Boron (dissolved)	7440-42-8	0.75
Cadmium (dissolved)	7440-43-9	0.01
Chromium (dissolved)	7440-47-3	0.1
Chloride (dissolved)	7647-14-5	250.0
Cobalt (dissolved)	7440-48-4	0.05
Copper (dissolved)	7440-50-8	1.3
Cyanide (dissolved)	57-12-5	0.2
Fluoride(dissolved)	16984-48-8	1.6
Iron (dissolved)	7439-89-6	1.0

Inorganic Chemicals:	CAS#	mg/L
Lead (dissolved)	7439-92-1	0.05
Manganese (dissolved)	7439-96-5	0.2
Molybdenum (dissolved)	7439-98-7	1.0
Mercury (total)	92786-62-4	0.002
Nickel (dissolved)	7440-02-0	0.2
Perchlorate (total)	04797-73-0	0.0256
pH (total)		6 – 9
Selenium (dissolved)	7782-49-2	0.05
Silver (dissolved)	7440-22-4	0.1
Sulfate (dissolved)		600.0
Total Dissolved Solids (dissolved)		1000.0
Uranium (dissolved)	7440-61-1	0.03
Zinc (dissolved)	9029-97-4	10.0

Radioactivity:		pCi/L
Combined Radium-226 & Radium-228 (total)		30

Nitrogen Compounds:		mg/L
NO_3-N (dissolved)		10

d. Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for ~~NO~~NO_3-N shall apply for discharges to ~~Outfall 051~~the SET and MES:

- Daily Maximum: 30 mg/L
- Quarterly average: 10 mg/L

In the event that effluent limits are exceeded, the Permittee shall enact the requirements of Condition 18 (Effluent Exceedance) of ~~contingency plan set forth in~~ this Discharge Permit.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

18. **EFFLUENT EXCEEDANCE**-In the event that analytical result of an effluent sample indicate an exceedance for any of the effluent limits set forth in paragraphs 16 and 17 of this Discharge Permit, the Permittees shall, within 24 hours following receipt of analytical results indicating the exceedance, collect and submit for analysis a subsequent sample for the particular analyte

that was in exceedance. In the event the analytical results of the subsequent sample confirm that the maximum limitation has been exceeded (i.e., confirmed exceedance), the Permittees shall take the following actions:

Within 24 hours of becoming aware of a confirmed exceedance, the Permittees shall:

a. Cease discharges to the system for which limits have been exceeded with the exception of the MES to which a confirmed exceedance shall not require immediate cessation;
b. Notify the NMED Ground Water Quality Bureau that an effluent limit set forth in this Discharge Permit has been confirmed to be in exceedance; and
c. Increase the frequency of effluent sampling to adequately establish the quality of discharges prior to resuming discharges to the system that was in exceedance. The sampling frequency for the particular analyte that was in exceedance shall increase from monthly or quarterly, as required by Condition 25 of this Discharge Permit, to weekly. If the particular analyte in exceedance remains below the effluent limit in three consecutive weekly samples, then the Permittees may resume discharges to the system that was in exceedance.

Within one week of becoming aware of a confirmed exceedance, the Permittees shall:

a. Submit copies of the analytical results for the initial and subsequent sample confirming the exceedance to NMED;
b. Examine the internal operational procedures, and maintenance and repair logs, required by Condition 13 of this Discharge Permit, for evidence of improper operation or function of the units and systems; and
c. Conduct a physical inspection of the treatment system to detect abnormalities, and correct any abnormalities.

A report detailing the corrections made shall be submitted to NMED within 30 days following correction.

In the event that analytical results from any two independent monthly effluent samples indicate an exceedance of the effluent limits for all discharge systems set forth in this Discharge Permit within any 12-month period, the Permittees shall propose to modify operational procedures or upgrade the treatment process to achieve the effluent limits. Within 90 days of receipt of the second sample analysis in which effluent limits have been exceeded, the Permittees shall submit to NMED for approval a corrective action plan. The plan shall include a schedule for completion of corrective actions. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule.

When analytical results from three consecutive months of effluent sampling

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do not exceed the maximum limitations set forth by this Discharge Permit, the Permittees are authorized to return to a monthly or quarterly monitoring frequency as required in this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3107.C NMAC]

~~14.~~19. **PERSONNEL QUALIFICATIONS**-Personnel responsible for the operation and maintenance and repair of the Facility shall successfully complete a program of classroom instruction or on-the-job training that provides the skills required to ensure the Facility is operated and maintained in a manner that complies with this Discharge Permit and all applicable local, state and federal laws and regulations. At a minimum, the operators shall be competent in the following:

a. Management procedures for hazardous waste materials;
b. Conducting inspections;
c. Communications or alarm systems;
d. Emergency response due to unauthorized releases, fire, explosions, or other potential unauthorized releases from the Facility and threat to human health; and
e. Emergency shutdown operations.

The operations and maintenance and repair of all or any part of the Facility shall be performed by, or under the direct supervision of, qualified personnel. Facility personnel shall review training and certifications on an annual basis to ensure training and certifications are current with any changes to the Facility's processes.

The Permittees shall maintain the following documents and records at the Facility for current personnel until closure of the Facility:

a. The job title for each position at the Facility with a narrative of the position responsibilities, reporting hierarchy, requisite skill, education and other qualifications assigned to the position.
b. The name of the individual who holds each position and all records documenting training and job experience demonstrating the qualifications of that individual to hold the position.

The Permittees shall maintain all documents and records pertaining to the training of operation and maintenance personnel, including former employees, for a period of five years and shall make such documents and records available to NMED upon request.

[20.6.2.3106.C NMAC, 20.7.4 NMAC]

20. **EMERGENCY ~~PLAN~~ RESPONSE PROCEDURES** The Permittees shall keep and maintain ~~an~~ emergency response ~~plan~~procedures at the Facility at all

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times. At a minimum, the ~~plan~~ procedures shall include the following:

a. Actions Facility personnel must take in response to fires, explosions or any unplanned sudden or non-sudden release of a water contaminant from the Facility to the environment.
b. A spill prevention and response plan to address all unauthorized releases to the environment or those that pose a threat to human health, chronic or acute.
c. ~~Communications and collaboration with local, state and federal emergency response personnel~~Use of the Incident Command System (ICS) in response to all emergencies. The ICS is based on the on-scene management structure protocols of the National Incident Management System (NIMS).
d. ~~Names, addresses and phone numbers for all persons qualified to act as an emergency coordinator~~Activation of Los Alamos National Laboratory's Emergency Operations Center (EOC) for incidents requiring Laboratory and/or community involvement. The EOC provides a central location for interagency and interjurasdictional coordination and executive decision making in support of an incident response.
~~e. A list of all emergency equipment at the Facility that may be utilized in the event of an emergency, its intended function and physical location.~~
~~f.~~e. An evacuation ~~plan~~ procedure for all Facility personnel which describes signals to be used to notify personnel of an evacuation, routes to evacuated the Facility and alternate evacuation routes.

The emergency response procedures ~~plan~~ shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~an annual~~ triennial -basis or in the event the plan fails during an emergency, the Facility changes design, construction, or accessibility, key personnel changes or the list of equipment changes. The emergency response procedures shall be made available for inspection at the facility ~~and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~
The Permittees shall submit a written summary of the procedures ~~plan~~ and any amendments to NMED no more than 30 days following finalization of the amended plan.

~~The Permittees' written summary shall be provided to the Los Alamos County Emergency Management Coordinator, Los Alamos Fire Department, Los Alamos County Police, Los Alamos Medical Center, New Mexico's Department of Homeland Security and Emergency Management (DHSEM), Pueblo of San Ildefonso, Pueblo of Santa Clara, Pueblo of Jemez and Pueblo of Cochiti, and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.3109.C NMAC]

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~~15.~~21. **INSTALLATION OF FLOW METERS**-Within 180 days following the effective date of this Discharge Permit, (by DATE), the Permittees shall install the following flow meters:

a. One flow meter to be installed on the RLW influent line to the Facility at a location that will capture and measure all influent to the Facility including waste water conveyed to the Facility by alternative methods (e.g. truck).
b. One flow meter to be installed on the effluent line to the SET at a location that will capture and measure all discharges of treated water to the SET.
c. One flow meter to be installed on the effluent line to the MES at a location that will capture and measure all discharges of treated water to the MES.
d. One flow meter to be installed on the discharge line to Outfall 051 at a location that will capture and measure all effluent discharges to Outfall 051.

Within 60 days following the installation of flow meters, and within 240 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ written confirmation of the meter installation, describing the type, calibration, and location of each flow meter. The flow meters shall be operational except during repair or replacement. Should a meter fail, it shall be repaired or replaced as soon as practical, but no later than 30 days from the date of the failure. During repair or replacement, an alternative method for determining the volume of RLW influent and effluent shall be used until the meter is repaired or replaced.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~16.~~22. **CALIBRATION OF FLOW METERS**-All flow meters referenced in this Discharge permit shall be capable of having their accuracy ascertained under actual working (field) conditions. A field calibration method shall be developed for each flow meter and that method shall be used to check the accuracy of each respective meter. Field calibrations shall be performed within 180 days following the effective date of this Discharge Permit (by DATE) and, at a minimum, on an annual basis thereafter, and immediately upon repair or replacement of a flow meter.

Flow meters shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field conditions. Field calibrations shall be performed by an individual knowledgeable in flow measurement and in the installation and operation of the particular device in use. A calibration report shall be prepared for each flow meter at the frequency calibration is required.

The flow meter calibration report shall include the following information:

a. The meter location and identification;
b. The method of flow meter field calibration employed;

c. The measured accuracy of each flow meter prior to adjustment indicating the positive or negative offset as a percentage of actual flow as determined by an in-field calibration check;
d. The measured accuracy of each flow meter following adjustment, if necessary, indicating the positive or negative offset as a percentage of actual flow of the meter; and
e. Any flow meter repairs made during the previous year or during field calibration.

The Permittees shall maintain records of flow meter calibration at a location accessible for review by NMED during Facility inspections.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

B. Monitoring and Reporting

~~17.~~23. **METHODOLOGIES-**Unless otherwise approved in writing by NMED, the Permittees shall conduct sampling and analysis in accordance with the most recent edition of the following documents:

a. American Public Health Association, Standard Methods for the Examination of Water and Waste water;
b. U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste;
c. U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey;
d. American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water;
e. U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition;
f. Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations; or
g. Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy;

[20.6.2.3107.A NMAC, 20.6.2.3107.B NMAC]

~~18.~~24. **MONITORING REPORTS-**The Permittees shall submit monitoring reports to NMED on a quarterly basis ~~and shall post all reports on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~. Quarterly sampling and analysis as required in this Discharge Permit shall be performed within the following periods and reports shall be submitted as described below:

a. Sampling and analysis completed between January 1 and March 31– report to be submitted to NMED by May 1;
b. Sampling and analysis completed between April 1 and June 30 – report to

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be submitted to NMED by August 1;

c. Sampling and analysis completed between July 1 and September 30–report to be submitted to NMED by November 1;

d. Sampling and analysis completed between October 1 and December 31–report to be submitted to NMED by February 1.

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC, 20.6.2.3109.C NMAC, 20.6.2.3107.A NMAC]

~~19.~~25. **INFLUENT VOLUMES RLW**-The Permittees shall measure the volume of all RLW influent waste water being conveyed to the Facility on a daily basis using the flow meter required to be installed pursuant to ~~by~~ this Discharge Permit.

The total daily and monthly volumes of RLW influent conveyed to the Facility shall be submitted to NMED in the quarterly monitoring reports ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

~~20.~~26. **INFLUENT VOLUMES TRU**-The Permittees shall estimate the volume of TRU influent waste water being conveyed to the Facility using electronic sensors which measure tank levels in both the acid waste and caustic waste influent tanks.

The electronic sensors on these tanks shall be operational except during repair or replacement. Should a sensor used to calculate TRU influent volumes fail, it shall be repaired or replaced as soon as practical, but no later than 30 days from the date of the failure. During repair or replacement, an alternative method for determining the flow of TRU influent shall be used until the defective sensor is repaired or replaced.

Volumes shall be determined by calculation using the head change and tank size. Operators shall record changes in influent tank levels whenever a batch of TRU waste water is conveyed to the Facility. The total daily and monthly volumes of TRU influent received by the Facility shall be submitted to NMED in the quarterly monitoring reports ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC].

~~21.~~27. **DISCHARGE VOLUMES**-The Permittees shall measure and record the volume of treated waste water discharged to the SET, MES and Outfall 051 on a daily basis. The Permittees shall determine effluent volumes as follows:

a. Discharge volumes to the SET shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the unit.

b. Discharge volumes to Outfall 051 shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the outfall.

c. Discharge volumes to the MES shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the unit.

The daily and monthly discharge volumes shall be submitted to NMED in the quarterly monitoring reports~~ and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

~~22.~~28. **WASTE TRACKING**-The Permittees shall maintain written or electronic records of ~~all the following all~~ -waste streams conveyed to ~~or from~~ the Facility~~: Radioactive Liquid Waste Bottoms, low-level sludge, TRU sludge and low-level solid waste (PPE, sample bottles, filters, membranes, etc).~~ At a minimum, the Permittees shall record the following information:

a. The name of the generator and a unique waste stream identification number.

b. The time period that the Permittee approves the generator to convey the waste stream to the Facility.

c. The location where the waste stream was generated.

d. Estimated volume and duration of the waste stream, including:
   - Estimated number of days per year discharge will occur;
   - Average daily volume received by the Facility when discharge occurs;
   - Maximum daily volume received by the Facility each year when discharge occurs; and
   - Estimated total volume discharged to the facility each year.

e. The waste stream characterization (i.e., analytical data or knowledge of process).

f. The names of the personnel that approved the receipt of the waste at the Facility (e.g., Waste Certifying official, RCRA Reviewer, and Facility Reviewer).

Permittees shall maintain written or electronic records of the following waste streams conveyed from the Facility: Radioactive Liquid Waste Bottoms, low-level sludge, TRU sludge, and low-level solid waste (PPE, sample bottles, filters, membranes, etc). The Permittees shall allow NMED or an authorized representative to have access to and copy, at reasonable times, records that must be kept under this condition.

The Permittees shall maintain all waste tracking records required by this Condition for five years from the date of the final discharge from the

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generator of that waste stream. The Permittees shall furnish upon request, and make available at all reasonable times for inspection, the waste tracking records required in this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~23.~~29. **EFFLUENT SAMPLING** -The Permittees shall sample and analyze effluent waste streams discharged to Outfall 051, the SET, and the MES.

Treated effluent samples shall be collected once per calendar month for any month in which a discharge occurs to Outfall 051. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for all water contaminants listed in 20.6.2.3103 NMAC, TKN and all toxic pollutants as defined in 20.6.2.7.WW NMAC.

Treated effluent samples shall be collected once per calendar month for any month in which a discharge occurs to the MES or SET. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for TKN, NO_3-N, TDS, Cl, F and perchlorate.

The Permittees shall collect and analyze effluent samples once per quarter for any quarterly period in which a discharge occurs to the MES or SET. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants as defined in 20.6.2.7.WW NMAC.

All samples shall be properly prepared, preserved, transported and analyzed in accordance with the parameters and methods authorized in this Discharge Permit and will be submitted to an independent environmental laboratory accredited under the National Environmental Laboratory Accreditation Program. Analytical results shall be submitted to NMED in the quarterly monitoring reports~~ and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~. For any calendar month during which no discharge occurs, the Permittees shall submit to NMED a report so stating.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~24.~~30. **SOIL MOISTURE MONITORING SYTEM FOR THE SET**-Within 120 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a proposed workplan, design and schedule for the installation of a moisture monitoring system for the detection of unauthorized releases from the SET. The system shall be designed to detect, at a minimum, absolute variations in volumetric soil moisture content below the SET within a precision of 2%. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on~~

~~LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

The Permittees shall install the moisture monitoring boreholes in accordance with the final workplan, design and schedule approved by NMED.

The Permittees shall use neutron moisture probes to log the moisture monitoring boreholes following installation to establish baseline conditions and to develop a calibration data set for the probe and a soil moisture action level, to be approved by NMED, which indicates that moisture is being detected below the SET at levels that are above baseline conditions.

Within 90 days following acceptance of the final construction of the moisture monitoring boreholes by the Permittees, the Permittees shall submit to NMED for approval the following items:

a. Confirmation that the moisture monitoring borehole installation has been completed.
b. Record drawings of the final design of the completed installation.
c. Reports on the baseline moisture condition and neutron probe calibration.
d. A proposed action level to be used to indicate that elevated moisture has been detected beneath the SET.

Upon approval or approval with conditions by NMED~~,~~ of the completed installation and soil moisture action level, the Permittees shall perform quarterly soil moisture monitoring in the moisture monitoring boreholes. ~~The Permittees' submittals along with any NMED response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~In the event that the soil moisture content beneath the SET exceeds the NMED approved action level, the Permittees shall enact the contingency plan set forth in this Discharge Permit.~~

The moisture monitoring boreholes and neutron probes shall be maintained so that the boreholes remain accessible for monitoring and the probe remains operational. Should the system or a component of the system fail, it shall be repaired or replaced as soon as possible, but no later than 90 days from the date of the failure. For good cause, NMED may approve a longer period.

The Permittees shall maintain all documents and records pertaining to the quarterly monitoring events and maintenance or repair of the soil moisture monitoring system for a period of five years and shall make such documents and records available to NMED upon request.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

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31. **SOIL MOISTURE DETECTION SYSTEM EXCEEDANCE-** In the event that the soil moisture detection system for the SET detects a soil moisture increase beneath the SET that exceeds the NMED approved action level, the Permittees shall take the following corrective actions:

a. Notify the NMED Ground Water Quality Bureau within 15 days following the date when the soil moisture was initially discovered to exceed the action level.
b. Within 60 days following the date when the soil moisture was initially discovered to exceed the action level, identify the source of the increased soil moisture beneath the SET to NMED and the basis for the identification of the source.

In the event the source of the soil moisture exceedance is demonstrated to be associated with a leak from or breach of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 30 days following the date when the Permittees identify the source of the increased soil moisture beneath the SET to NMED. At a minimum, the corrective action plan shall include the following:

a. Removal of all standing liquid from one or both basins (as appropriate);
b. A proposal for repairing or replacing the synthetic liners within the SET, if leakage through the synthetic liners is found to be the source, or for other repairs;
c. A plan for re-instituting soil moisture monitoring following repairs to the SET to demonstrate that the repairs resolved the source of the increased soil moisture beneath the SET; and
d. A schedule for implementation of the corrective action plan elements.

In the event the source of the soil moisture exceedance is demonstrated to be associated with an occurrence other than a failure of the SET, the Permittees shall submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level. The corrective action plan shall include any actions necessary to ensure the soil moisture detection system is operating within its intended function as required by this Discharge Permit including, but not limited to, re-calibration.

Upon NMED approval, or approval with conditions, the Permittees shall implement the corrective action plan according to the approved schedule.

[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

~~25.~~32. **GROUND WATER FLOW-**The Permittees shall submit a ground water flow direction report to NMED on an annual basis. The report shall contain regional, intermediate and alluvial aquifer ground water depth-to-water measurements, existing interconnections with other aquifers (if any are

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known), a narrative description of the known characteristics of the ground water elevation and flow direction within each aquifer and, to the extent practicable, ground water elevation contour map(s) for the aquifers underlying Sandia, Pajarito, Ten-Site and Mortandad Canyons.

The ground water elevation contour maps shall depict the ground water flow direction based on the most recent representative ground water elevation data from monitoring wells located in the subject areas. Ground water elevations shall be estimated using common interpolation methods to a contour interval approved by NMED and appropriate to the available data. Ground water elevation contour maps shall depict the water table and potentiometric surfaces, ground water flow directions, and the location and name of each monitoring well and discharge location unit associated with this Discharge Permit.

The ground water flow direction report shall be submitted to NMED in the monitoring report due on February 1 of each year~~ and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C]

33. **REPLACEMENT OF TWO EXISTING GROUND WATER MONITORING WELLS~~ REPLACEMENT~~** Within 90 days of the effective date of this Discharge Permit (by DATE), the permittees shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051. The well installation work plan will include proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement wells in accordance with the Groundwater Quality Bureau, Monitoring Well Construction and Abandonment Guidelines, Revision 1.1, March 2011and the approved work plan and schedule.

34. **MONITORING WELL LOCATION-**In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well is not located hydrologically downgradient of the discharge location it is intended to monitor, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods and well specifications, and proposing a schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule.

Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days following well completion, the Permittees shall submit to NMED a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map.

Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC]

35. **MONITORING WELL CONSTRUCTION**-In the event that information available to NMED indicates that a well is not constructed in a manner consistent with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Guidelines, Revision 1.1*, March 2011; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule.

Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days of well completion, the Permittees shall submit to NMED construction and lithologic logs, survey data, and a ground water elevation contour map.

Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.

Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, and abandonment and documentation of the abandonment procedures shall be completed in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011, and all applicable local, state, and federal laws and regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]

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~~26.~~36. **GROUND WATER MONITORING** - The Permittees shall collect ground water samples from the following ground water monitoring wells on a quarterly basis and analyze the samples for TKN, NO_3-N, TDS, Cl, F and perchlorate.

a. **Replacement Alluvial Well** ~~**MCO-3** - previously constructed and located in the a~~Alluvial aquifer replacement well installed as a condition of this Discharge Permit ~~presumed to be~~ located hydrologically downgradient of Outfall 051.

b. **Replacement Alluvial Well** ~~**MCO-7** - previously constructed and located in the a~~Alluvial aquifer replacement well installed as a condition of this Discharge Permit ~~presumed to be~~ located hydrologically downgradient of Outfall 051.

c. **MCOI-6**-previously constructed and located in the intermediate aquifer ~~presumed to be~~ hydrologically downgradient of Outfall 051.

The Permittees shall collect ground water samples from the following ground water monitoring wells on an annual basis and analyze the samples for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants listed in 20.6.2.7.WW.

a. **Replacement Alluvial Well** – Installed as a condition of this Discharge Permit and hydrologically downgradient of Outfall 051.

~~a. **MCO-3 previously constructed and located in the alluvial aquifer presumed to be hydrologically downgradient of Outfall 051.**~~

b. **Replacement Alluvial Well**~~**MCO-7** - previously constructed and located in the alluvial aquifer presumed to be~~ Installed as a condition of this Discharge Permit and hydrologically downgradient of Outfall 051~~hydrologically downgradient of Outfall 051.~~

c. **MCOI-6** - previously constructed and located in the intermediate aquifer presumed to be hydrologically downgradient of Outfall 051.

d. **R-46** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

e. **R-60** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

f. **R-1** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

g. **R-14** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

Sampling shall be done in accordance with the methods authorized in this Discharge Permit and using the following procedure:

a. Measure the ground-water surface elevation, to the nearest hundredth (0.01) of a foot, from the top of the casing, each time ground water is sampled.

b. Calculate total volume of water within the monitoring well using the most recent total depth measurement.

c. For intermediate and regional aquifer wells, purge three well volumes of water from the monitoring well prior to sampling, using an adequate pumping system. For alluvial wells, purge well for a minimum of one well volume.
d. Collect samples from the well using appropriate methods to avoid cross-contamination of the samples and sources.
e. Prepare the Chain-of-Custody, preserve the sample and transport samples in accordance with methods authorized in this Discharge Permit.
f. Samples shall be analyzed by an independent analytical laboratory accredited under the National Environmental Laboratory Accreditation Program (NELAP) using EPA approved test methods.

The Permittees may submit to NMED for approval Standard Operating Procedures developed for the Interim Facility-Wide Groundwater Monitoring Plan that would apply in lieu of the sampling protocols described in this Permit Condition. Upon NMED approval or partial approval of such alternate plan, the approved plan or portion thereof shall apply and be fully enforceable in lieu of this Permit Condition. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

The Permittees shall use sampling and analytical methods that ensure the production of accurate and reliable data indicative of ground water quality in all ground water that may be affected by any discharges from the Facility. The Permittees shall prepare ground water monitoring reports describing, in detail, the sampling and analytical methods used. The ground water monitoring reports shall contain, at minimum, the following information:
a. Date sample was collected;
b. Time sample was collected;
c. Individuals collecting sample;
d. Monitoring well identification;
e. Physical description of monitoring well location;
f. Ground-water surface elevation;
g. Total depth of the well;
h. Total volume of water in the monitoring well prior to sample collection;
i. Total volume of water purged prior to sample collection;
j. Physical parameters including temperature, conductivity, pH, oxidation-reduction potential;
k. Description of sample methods (i.e., constituent being sampled for, container used, preservation methods);
l. Chain-of custody; and
m. Map, to scale, identifying monitoring wells and their location.

The ground water monitoring report shall be submitted to NMED with the quarterly monitoring report required in this Discharge Permit ~~and posted on LANL's Electronic Public Reading Room located at~~

~~http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

37. **GROUND WATER EXCEEDANCE-** NMED reviews ground water data that is generated by the Permittees from samples collected from the monitoring wells identified in this Discharge Permit and other monitoring wells in the vicinity of the Facility. The Permittees report newly detected ground water quality standard exceedances or the newly detected toxic pollutants (as defined in this Discharge Permit and in 20.6.2.7.WW NMAC) in ground water for the entire Laboratory to NMED. If NMED determines that a ground water quality standard is exceeded or that a toxic pollutant is present in ground water, potentially due to a discharge associated with the Facility or defined systems in this Discharge Permit, the Permittees shall submit a ground water investigation/source control workplan to NMED for approval within 60 days following notification to do so by NMED.

At a minimum, the ground water investigation/source control workplan shall include the following elements:

a. A proposal to investigate the source, nature and extent of the ground water contamination, if unknown, which may utilize existing ground water monitoring wells or may propose the installation of new monitoring wells, as appropriate;
b. A proposal to mitigate the discharge or mobilization of the water contaminant which might be causing ground water contamination, as appropriate; and
c. A schedule for implementation of the workplan and submittal of a report to NMED.

Upon NMED approval of the ground water investigation/source control workplan, or approval of the plan with conditions, the Permittees shall implement the workplan and submit a written report to NMED in accordance with the approved schedule.

Should the findings of the ground water investigation reveal that a discharge associated with the Facility or defined systems in this Discharge Permit is a source of the ground water contamination, the Permittees shall abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC, following notification from NMED.

This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the March 1, 2005 Compliance Order on Consent (Consent Order) agreed to by NMED, DOE, and the Regents of the University of California (predecessor to LANS).

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.E NMAC, 20.6.2.3107.A NMAC]

C. **Contingency Plans**

~~27. **CONTAINMENT** The Permittees shall institute corrective actions, as necessary, to ensure the protection of ground water and human health. In the event that a unit or system or secondary containment for a unit or system reveals damage that could result in structural failure or a release to the environment, the Permittees shall take the following actions:~~

~~a. The Permittees shall remove the unit or system from service immediately.~~

~~b. The Permittees shall take immediate, and, if necessary temporary, corrective actions to minimize the potential for a release.~~

~~c. If failure of the unit or system or secondary containment resulted in a release to the environment, the Permittees shall provide NMED oral notification of the release in accordance with 20.6.2.1203 NMAC within 24 hours of learning of the release and take subsequent corrective actions as required in this Discharge Permit.~~

~~d. Within 90 days following identification of the potential failure or release, the Permittees shall submit to NMED for approval a written corrective action report to include, at minimum, the following:~~

~~1) Identification of the unit or system, or secondary containment for a unit or system in which the failure was observed.~~

~~2) The date and time the failure was observed and the date and time it was estimated to have begun.~~

~~3) The potential cause of the failure.~~

~~4) For units in which a release occurred to secondary containment but was not released to the environment, the rate at which the release occurred and total volume released to the secondary containment.~~

~~5) The characteristics of the waste stream being treated, stored or conveyed by the unit or system, with analytical results from waste stream samples taken with date, time, technical staff collecting the sample and the lab report with QA/QC.~~

~~6) The corrective actions taken to remediate the failure or release with a timeline of when actions were implemented.~~

~~7) Long-term actions, if any, that are proposed to be employed for maintaining the integrity of the secondary containment and the schedule for implementing such actions.~~

~~8) Ongoing measures for monitoring, inspecting, and determining structural integrity of the secondary containment.~~

~~9) Proposed operation and maintenance and repair protocol, if applicable, to be instituted to prevent future failures.~~

~~Upon NMED approval of the corrective action report, the Permittees shall implement any approved long-term actions to maintain the integrity of the secondary containment, and any other approved measures or protocols,~~

~~according to the approved schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[20.6.2.3107.A NMAC]~~

~~28. **WATER-TIGHTNESS** In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit, or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:~~

~~a. If the unit or system failure resulted in an unauthorized release, either through a primary or secondary containment unit or system, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:.~~

~~b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:~~

~~1) The Permittees shall remove the unit or system from service immediately; and~~

~~2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.~~

~~c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.~~

~~If repair or replacement of a unit or system requires construction, the Permittees shall submit plans and specifications to NMED with the proposed corrective actions. The Permittees' proposal shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).~~

~~Upon NMED approval, the Permittees shall implement the approved corrective actions according to the approved schedule. The Permittees shall post NMED's response on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~Prior to placing a repaired or replaced unit or system back into service, the~~

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~~Permittee shall repeat the water-tightness testing in accordance with Condition 8 to verify the effectiveness of the repair or replacement, and submit a report detailing the completion of the corrective actions to NMED. The report shall include the date of the test, the name of the individual that performed the test, written findings, photographic documentation of the unit's interior and water tightness test results. If notified to do so by NMED, the Permittees shall also submit record drawings that include the final, construction details of the unit. Record drawings shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978). The Permittees' submittal shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]~~

29. ~~**SETTLED SOLIDS REMOVAL** In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds a depth of one foot, or in the event that the Permittees otherwise plan to initiate removal of settled solids from an open unit or system, the Permittees shall propose a plan for the removal and disposal of the settled solids from the unit or system. At least 120 days prior to any settled solids removal, the Permittees shall submit to NMED for approval a written settled solids removal and disposal plan. The plan shall include characterization of the settled solids, the estimated volume of settled solids to be removed, a method for removal throughout the unit or system in a manner that is protective of the structural integrity of the unit or system, a schedule for completing the settled solids removal and disposal, and a description of how the settled solids will be contained, transported, and disposed of in accordance with all local, state, and federal laws and regulations. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC.]~~

30. ~~**DAMAGE TO STRUCTURAL INTEGRITY** In the event that an inspection required in this Discharge Permit, or any other observation, reveals significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall notify NMED orally within 24 hours, and shall propose the repair or replacement of the treatment system or its associated components. Within 90 days after discovery by the Permittees or following notification from NMED that corrective action is required, the Permittees shall submit to NMED for approval a written corrective action plan that includes a schedule for implementation and completion. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees~~

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~~shall remedy any deterioration or malfunction of equipment or structures which are discovered during inspection. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[20.6.2.3107.A NMAC]~~

~~31.~~ **~~FREEBOARD EXCEEDANCE~~** ~~In the event that freeboard, two feet or an NMED-approved alternative, is not maintained in an open tank, impoundment or other open unit or system that contains a liquid or semi-liquid, the Permittees shall take immediate corrective actions to restore the required freeboard.~~

~~32.~~

~~33. In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the Permittees shall submit to NMED for approval a proposed corrective action plan to restore the required freeboard within 15 days following the date when exceedance of the required freeboard was initially discovered. The plan shall include a schedule for completion of corrective actions and quantifiable assessments to demonstrate preservation of the required freeboard for a period no less than five years. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]~~

~~34.~~ **~~EFFLUENT EXCEEDANCE~~** ~~In the event that analytical result of an effluent sample indicate an exceedance for any of the effluent limits set forth by this Discharge Permit, the Permittees shall collect and submit for analysis a subsequent sample for the particular analyte that was in exceedance within 24 hours following receipt of analytical results indicating the exceedance. In the event the analytical results of the subsequent sample confirm that the maximum limitation has been exceeded (i.e., confirmed exceedance), the Permittees shall take the following actions:~~

~~Within 24 hours of becoming aware of a confirmed exceedance, the Permittees shall:~~

~~a. Cease discharges to the system that limits have been exceeded with the exception of the MES to which a confirmed exceedance shall not require immediate cessation;~~

~~Notify the NMED Ground Water Quality Bureau that an effluent limit set forth in this Discharge Permit has been confirmed to be in exceedance; and~~

~~Increase the frequency of effluent sampling to adequately establish the~~

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~~quality of discharges prior to resuming discharges to the system that was in exceedance.~~

~~Within one week of becoming aware of a confirmed exceedance, the Permittees shall:~~

~~a. Submit copies of the analytical results for the initial and subsequent sample confirming the exceedance to NMED;~~

~~a. Examine the internal operational procedures, and maintenance and repair logs, required by Condition 11 of this Discharge Permit, for evidence of improper operation or function of the units and systems; and~~

~~Conduct a physical inspection of the treatment system to detect abnormalities, and correct any abnormalities.~~

~~A report detailing the corrections made shall be submitted to NMED within 30 days following correction. The Permittees' report shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~In the event that analytical results from any two independent monthly effluent samples indicate an exceedance of the effluent limits for all discharge systems set forth in this Discharge Permit within any 12-month period, the Permittees shall propose to modify operational procedures or upgrade the treatment process to achieve the effluent limits. Within 90 days of receipt of the second sample analysis in which effluent limits have been exceeded, the Permittees shall submit to NMED for approval a corrective action plan. The plan shall include a schedule for completion of corrective actions. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule. The Permittees' corrective action plan along with NMED's response shall be posted by the Permittees on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~When analytical results from three consecutive months of effluent sampling do not exceed the maximum limitations set forth by this Discharge Permit, the Permittees are authorized to return to a monthly or quarterly monitoring frequency as required in this Discharge Permit.~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3107.C NMAC]~~

~~**SOIL MOISTURE DETECTION SYSTEM EXCEEDANCE** In the event that the soil moisture detection system for the SET detects a soil moisture increase beneath the SET that exceeds the NMED approved action level, the Permittees shall take the following corrective actions:~~

a. ~~Notify the NMED Ground Water Quality Bureau within 15 days following the date when the soil moisture was initially discovered to exceed the action level.~~
b. ~~Propose the source of the increased soil moisture beneath the SET to NMED within 60 days following the date when the soil moisture was initially discovered to exceed the action level. Include the basis for the determination.~~

~~In the event the source of the soil moisture exceedance is demonstrated to be associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 120 30 days following the date when the soil moisture was initially discovered to exceed the action level. At a minimum, the corrective action plan shall include the following:~~

a. ~~Removal of all standing liquid from one or both basins (as appropriate);~~
b. ~~A proposal for repairing or replacing the synthetic liners within the SET, if leakage through the synthetic liners is found to be the source, or for other repairs;~~
c. ~~A plan for re-instituting soil moisture monitoring following repairs to the SET to demonstrate that the repairs resolved the source of the increased soil moisture beneath the SET; and~~
d. ~~A schedule for implementation of the corrective action plan elements.~~

~~In the event the source of the soil moisture exceedance is demonstrated to be associated with an occurrence other than a failure of the SET, the Permittees shall submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level. The corrective action plan shall include any actions necessary to ensure the soil moisture detection system is operating within its intended function as required by this Discharge Permit including, but not limited to, re-calibration.~~

~~Upon NMED approval, or approval with conditions, the Permittees shall implement the corrective action plan according to the approved schedule. The Permittees' corrective action plan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]~~

35. ~~**MONITORING WELL LOCATION** In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well is not located hydrologically downgradient of the discharge location it is intended to monitor, NMED may require the Permittees to install a replacement well or wells. Within 930 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a~~

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~~well installation work plan, describing each proposed well location, drilling methods and well specifications, and proposing a schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map.~~

~~Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC]~~

~~36. **MONITORING WELL CONSTRUCTION** In the event that information available to NMED indicates that a well is not constructed in a manner consistent with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Guidelines, Revision 1.1*, March 2011; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days of well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) construction and lithologic logs, survey data, and a ground water elevation contour map.~~

~~Replacement wells shall be located, installed, and completed in accordance~~

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~~with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.~~

~~Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, and abandonment and documentation of the abandonment procedures shall be completed in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011, and all applicable local, state, and federal laws and regulations. The well abandonment documentation shall be submitted to NMED and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) within 60 days of completion of well plugging activities.~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]~~

~~37. **GROUND WATER EXCEEDANCE** NMED reviews ground water data that is generated by the Permittees from samples collected from the monitoring wells identified in this Discharge Permit and other monitoring wells in the vicinity of the Facility. The Permittees report newly detected ground water quality standard exceedances or the newly detected toxic pollutants (as defined in this Discharge Permit and in 20.6.2.7.WW NMAC) in ground water for the entire Laboratory to NMED. If NMED determines that a ground water quality standard is exceeded or that a toxic pollutant is present in ground water, potentially due to a discharge associated with the Facility or defined systems in this Discharge Permit, the Permittees shall submit a ground water investigation/source control workplan to NMED for approval within 60 days following notification to do so by NMED. The Permittees' workplan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~
~~At a minimum, the ground water investigation/source control workplan shall include the following elements:~~
~~a. A proposal to investigate the source, nature and extent of the ground water contamination, if unknown, which may utilize existing ground water monitoring wells or may propose the installation of new monitoring wells, as appropriate;~~
~~b. A proposal to mitigate the discharge or mobilization of the water contaminant which might be causing ground water contamination, as appropriate; and~~
~~c. A schedule for implementation of the workplan and submittal of a report to NMED.~~

~~Upon NMED approval of the ground water investigation/source control workplan, or approval of the plan with conditions, the Permittees shall implement the workplan and submit a written report to NMED and post on~~

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~~LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) in accordance with the approved schedule.~~

~~Should the findings of the ground water investigation reveal that a discharge associated with the Facility or defined systems in this Discharge Permit is a source of the ground water contamination, the Permittees shall abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC, following notification from NMED.~~

~~This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the March 1, 2005 Compliance Order on Consent (Consent Order) agreed to by NMED, DOE, and the Regents of the University of California (predecessor to LANS).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3109.E NMAC, 20.6.2.3107.A NMAC]~~

38. **SPILL OR UNAUTHORIZED RELEASE-**In the event of ~~that~~ a release not authorized in this Discharge Permit ~~occurs~~(other than an Actual or Threatened Water-Tightness Failure covered by Condition 9 of this Discharge Permit, an Effluent Exceedance covered by Condition 18 of this Discharge Permit or a Soil Moisture Monitoring Exceedance covered by Condition 31 of this Discharge Permit), the Permittees shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in 20.6.2.1203 NMAC and summarized below.

Within 24 hours following discovery of the unauthorized discharge, the Permittees shall orally notify NMED and provide the following information:

a. The name, address, and telephone number of the person or persons in charge of the Facility;
b. The identity and location of the Facility;
c. The date, time, location, and duration of the unauthorized discharge;
d. The source and cause of unauthorized discharge;
e. A description of the unauthorized discharge, including its estimated chemical composition;
f. The estimated volume of the unauthorized discharge; and
g. Any actions taken to mitigate immediate damage from the unauthorized discharge.

Within one week following discovery of the unauthorized discharge, the Permittees shall submit written notification to NMED with the information listed above and any pertinent updates.

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Within 15 days following discovery of the unauthorized discharge, the Permittees shall submit to NMED for approval a corrective action report and plan describing any corrective actions taken and to be taken to address the unauthorized discharge that includes the following:

a. A description of proposed actions to mitigate damage from the unauthorized discharge;
b. A description of proposed actions to prevent future unauthorized discharges of this nature; and
c. A schedule for completion of proposed actions.

Upon NMED approval of the corrective action report and plan, the Permittees shall implement the approved actions according to the approved schedule. ~~The Permittees' corrective action report and plan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to 20.6.2.1203.A(1) NMAC, the Permittees may be required to abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC.

Nothing in this condition shall be construed as relieving the Permittees of the obligation to comply with all requirements of 20.6.2.1203 NMAC.

[NMSA 1978, § 74-6-5.D, 20.6.2.1203 NMAC, 20.6.2.3109.B NMAC]

39. **FAILURES IN DISCHARGE PLAN/DISCHARGE PERMIT**-In the event that NMED or the Permittees identify any failure of the discharge plan or this Discharge Permit not specifically set forth herein, NMED may require the Permittees to submit for its approval a corrective action plan and a schedule for completion of corrective actions to address the failure. Additionally, NMED may require a Discharge Permit modification to achieve compliance with Part 20.6.2 NMAC. ~~The Permittees' corrective action plan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

D. Closure

40. **CESSATION OF OPERATION OF SPECIFIC UNITS-** Within 60 days of the effective date of this Discharge Permit (by DATE), the Permittees shall permanently cease operation of the following units:

a. The 75,000 gallon concrete influent storage tank (75K tank) will be taken out of service as an influent storage tank but remain available for use as emergency storage;
b. The 100,000 gallon steel influent storage tank (100K tank);
c. The two 26,000 gallon concrete clarifiers located within Building 1 of TA-50;
d. The two 25,000 gallon concrete effluent storage tanks (WM2-N, WM2-S); and
e. The gravity filter located within Building 1 of TA-50.

Upon the cessation of operation of these specific units, the Permittees shall initiate the requirements for stabilization (Condition 42) of the individual units, systems and components in accordance with this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

41. **STABILIZATION OF INDIVIDUAL UNITS AND SYSTEMS** - Within 12~~9~~0 days from the permanent cessation of operation of a unit or system, the Permittees shall submit to NMED for approval a written work plan for the stabilization of the unit or system for which operation has ceased. ~~-~~The work plan shall identify ~~characterization~~ activities to be taken, and steps necessary to ensure that the unit or system can no longer receive a discharge and that no further releases of water contaminants occur as a result of the unit or system. At a minimum, the work plan shall include the following:
a. Identification of the unit or system in which cessation of use has occurred;
b. A detailed description of the function of the unit or system;
c. A detailed description of the historic influent waste streams to the unit or system;
d. A detailed description of all conveyance lines leading to the unit or system and a description of how the lines will be terminated, plugged, re-routed or bypassed so that a discharge to the unit or system can no longer occur;
e. Identification of those portions of the ~~approved~~ Closure Plan required in Condition 4~~3~~4 of this Discharge Permit that will be implemented;
f. A description of all proposed interim measures, actions and controls that will be implemented until such time of final removal of the unit, system or component to prevent the release of water contaminants into the environment; to prevent water contaminants, including storm water run-on and run-off, from moving into ground water; and to prevent water contaminants from posing a threat to human health;
~~f.~~g. ~~A detailed description of the actions that will be taken to investigate and characterize, to the extent possible given site constraints, the potential impact to soil and groundwater from the facility, system, or individual unit;~~ and
~~g.~~h. A schedule for implementation.

Upon NMED approval of the work plan, the Permittees shall implement the plan according to the approved schedule.

Within 30 days following the completion of all interim measures, actions and controls as required by this condition, the Permittees shall submit to NMED for approval a final written report on the actions taken to implement the partial closure. ~~The Permittees' workplan and final written report along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

42. **CLOSURE PLAN-**Permittees shall maintain the approved closure plan for the Facility. Within 180 days of cessation of operations for the Facility, Permittees shall implement the approved closure plan. In the event Permittees modify or expand the Facility in a manner that exceeds the scope of the approved closure plan, Permittees shall propose changes to the closure plan accordingly. ~~Within 180 days from the effective date of this Discharge Permit (by DATE) the Permittees shall submit to NMED for approval a written closure plan for the Facility. The closure plan shall identify steps necessary to perform final closure of the Facility, including all units and systems at the Facility.~~

~~At a minimum, the closure plan shall include the following:~~

~~a. A detailed description of how each unit and system at the Facility will be closed.~~

~~b. A detailed description of the actions to be taken to decommission, demolish, and remove each unit, system, and other structure, including any secondary containment system components.~~

~~A detailed description of the actions and controls that will be implemented during closure to prevent the release of water contaminants into the environment; to prevent water contaminants, including run-on and run off, from moving into ground water; and to prevent water contaminants from posing a threat to human health.~~

~~c. A detailed description of the actions that will be taken to investigate and characterize, to the extent possible given site constraints, the potential impact to soil and groundwater from the facility, system, or individual unit.~~

~~d. A detailed description of the methods to be used for decontamination of the site and decontamination of equipment used during closure.~~

~~e. A detailed description of the actions that will be taken to reclaim the site, including placement of clean fill material and re-grading to blend with surrounding surface topography, minimize run-on and run-off, and prevent infiltration of water, and re-vegetation.~~

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~~f. A detailed description of all monitoring, maintenance and repair, and controls that will be implemented after closure, and of all actions that will be taken to minimize the need for post-closure monitoring, maintenance and repair, and controls.~~

~~g. A ground water monitoring plan to detect water contaminants that might move directly or indirectly into ground water after closure, which shall provide for, at a minimum, eight consecutive quarters of ground water monitoring after achieving the standards of NMSA 20.6.2.3103..~~

~~h. A detailed description of the methods that will be used to characterize all wastes generated during closure, including treatment residues, contaminated debris, and contaminated soil, in compliance with all local, state, and federal laws and regulations.~~

~~i. A detailed description of the methods that will be used to remove, transport, treat, recycle, and dispose of all wastes generated during closure in compliance with all local, state, and federal laws and regulations.~~

~~j. A detailed schedule for the closure and removal of each unit and system, which lists each proposed action and the estimated time to complete it.~~

~~If the Permittees make any changes to the Facility that would affect the implementation of the approved Closure Plan, the Permittees shall submit to NMED for approval a written notification and an amended Closure Plan. Permittees will provide annual updates to NMED describing modifications to the Closure Plan. All documents required to be submitted to NMED in this Condition by the Permittees along with NMED's responses shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). Public comments will be accepted by NMED regarding this submittal for a period of 30 days prior to finalizing conditions to the Closure Plan.~~

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

~~42.~~43. **FINAL CLOSURE**-Upon cessation of operation of the Facility, system or individual unit, the Permittees shall implement the approved Closure Plan according to the approved schedule therein.

Once closure begins, and until all closure requirements (excluding post-closure ground water monitoring) are completed, the Permittees shall submit to NMED, with the monitoring reports required in this Discharge Permit, quarterly status reports describing the closure actions taken during the previous reporting period and the actions scheduled for the next reporting period. Within 90 days following the completion of the closure, the Permittees shall submit to NMED for approval a final written report on the actions taken to implement closure. ~~The Permittees' quarterly status reports and final written report, along with NMED's response, shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

~~43.~~44. **POST-CLOSURE GROUND WATER MONITORING**- After closure has been completed and approved by NMED, the Permittees shall continue ground water monitoring of any wells dedicated to the Facility according to the approved Closure Plan to confirm that the standards of 20.6.2.3103 NMAC are not exceeded and toxic pollutants in 20.6.2.7.WW NMAC are not present in ground water. Such monitoring shall continue for a minimum of eight consecutive quarters.

If monitoring results show that a ground water quality standard in 20.6.2.3103 NMAC is exceeded or a toxic pollutant in 20.6.2.7.WW NMAC is present in ground water, the Permittees shall implement the requirements of Condition 38 (Ground Water Exceedance) of ~~contingency plan set forth in~~ this Discharge Permit.

This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the March 1, 2005 Compliance Order on Consent (Consent Order) agreed to by NMED, DOE, and the Regents of the University of California (predecessor to LANS).

Upon demonstration confirming ground water quality does not exceed the standards of 20.6.2.3103 NMAC and does not contain a toxic pollutant in 20.6.2.7.WW NMAC, the Permittees may submit a written request to cease ground water monitoring activities. ~~The Permittees' request for cessation of ground water monitoring along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

Following notification from NMED that post-closure monitoring may cease, the Permittees shall plug and abandon the monitoring well in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1,* March 2011.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.F NMAC, 20.6.2.4103.D NMAC]

~~44.~~45. **TERMINATION-** When all closure and post-closure requirements have been met, the Permittees may submit to NMED a written request for termination of the Discharge Permit. ~~The Permittees' request to terminate along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

If the Discharge Permit expires or is terminated for any reason and any standard of 20.6.2.3103 NMAC is or will be exceeded, or a toxic pollutant in 20.6.2.7.WW NMAC is or will be present in ground water, NMED may require the Permittees to submit an abatement plan pursuant to 20.6.2.4104 NMAC.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.F NMAC, 20.6.2.4103.D NMAC]

46. INTEGRATION WITH THE CONSENT ORDER -- The investigation, characterization, cleanup and corrective action requirements for potential releases of contaminants into soil, groundwater and other environmental media from the Facility and associated "solid waste management units" (SWMUs) and "areas of concern" (AOCs) is governed under the Compliance Order on Consent (March 1, 2005) (Consent Order) entered into between the New Mexico Environment Department and the Permittees pursuant to the New Mexico Hazardous Waste Act, NMSA 1978, §74-4-10 and the New Mexico Solid Waste Act, NMSA 1978, §74-9-36(D) (*see* http://www.nmenv.state.nm.us/HWB/documents/LANL_10-29-2012_Consent_Order_-_MODIFIED_10-29-2012.pdf). The Consent Order provides at Section III.A that it was established to 1) fully determine the nature and extent of releases of contaminants (as that term is defined at Section III.B) at SWMUs and AOCs, 2) identify and evaluate, where needed, alternatives for corrective measures, including interim measures, to clean up contaminants in the environment, and to prevent or mitigate the migration of contaminants at or from SWMUs and AOCs; and 3) to implement such corrective measures. The Facility, tanks, vaults, former storage area, and all associated influent and effluent lines are identified as SWMUs and/or AOCs under the Consent Order (Section **IV.B CANYON WATERSHED INVESTIGATIONS)** and subject to its requirements (for a full description *see* the Investigation Report for Upper Mortandad Canyon Aggregate Area, Revision 1 (http://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-10-02046)). The investigation, characterization, cleanup and corrective action at the Facility and associated SWMUs and AOCs shall be conducted solely under the Consent Order as provided for under Section III.W.1, and not under this Permit. No activities required under this Permit shall conflict with or duplicate activities required for SWMUs and AOCs identified under the Consent Order.

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E. General Terms and Conditions

~~45.~~47. **APPROVALS -** Upon receipt of a work plan, written proposal, report, or other document subject to NMED approval, NMED will review the document and may either approve the document, approve the document with conditions, or disapprove the document. Upon completing its review, NMED will notify the Permittees in writing of its decision, including the reasons for any conditional approval or disapproval.

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[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~46.~~48. **RECORD KEEPING -** The Permittees shall maintain a written record of the following information and shall make it available to NMED upon request:

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a. Information and data used to prepare the application for this Discharge Permit.
b. Records of any releases or discharges not authorized in this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.
c. Records, including logs, of the operation and maintenance and repair of all Facility and equipment used to treat, store or dispose of waste water.
d. Facility record drawings (plans and specifications) showing the actual construction of the Facility and shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).
e. Copies of monitoring reports completed and submitted to NMED pursuant to this Discharge Permit.
f. The volume of waste water or other wastes discharged pursuant to this Discharge Permit.
g. Ground water quality and waste water quality data collected pursuant to this Discharge Permit.
h. Copies of construction records (well logs) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit.
i. Records of the maintenance and repair, replacement, and calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit.
j. Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit.

With respect to sampling and laboratory analysis, the Permittees shall record and maintain following information and shall make it available to NMED upon request:

a. The dates, location and times of sampling or field measurements;
b. The name and job title of the individuals who performed each sample collection or field measurement.
c. The sample analysis date of each sample.
d. The name and address of the laboratory, and the name of the signatory

authority for the laboratory analysis.

e. The analytical technique or method used to analyze each sample or collect each field measurement.
f. The results of each analysis or field measurement, including raw data;
g. The results of any split, spiked, duplicate or repeat sample.
h. All laboratory analysis chain-of-custody forms and a description of the quality assurance and quality control procedures used.

The written record shall be maintained by the Permittees at a location accessible during a Facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to NMED upon request.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.D NMAC, 20.6.2.3109.B NMAC]

49. **ELECTRONIC POSTING** - Commencing on the effective date of this Discharge Permit, Permittees voluntarily agree to post on LANL's Electronic Public Reading Room (located at http://eprr.lanl.gov/oppie/service (or as updated)), the information listed below within 10 business days of the due date specified in the relevant permit condition or, in the case of NMED responses, within 10 business days of receipt by Permittees.

PERMIT CONDITION	INFORMATION/REPORT
VI.A.1	Annual Update
VI.A.2	Notification of Changes
VI.A.8	Water Tightness Testing
VI.A.9	Summary Report for Settled Solids Depth Results
VI.A. 12	Proposal for Alternative Freeboard Levels and NMED Responses
VI.A.17	Written Confirmation of Installation of Flow Meters
VI.B.20	Quarterly Monitoring Reports
VI.B.26	Soil Moisture Monitoring System for SET and NMED Response
VI.B.27	Ground Water Flow Direction Report
VI.D.44	Closure Plan and NMED Response
VI.D.45	Final Closure – Quarterly Reports, Final Report, and NMED Responses
VI.D.46	Post-Closure Request to Cease Ground Water Monitoring and NMED Response
VI.D.47	Request for Termination of Discharge Plan and NMED Response

This permit condition is not enforceable under 20.6.2.1220 NMAC or NMSA

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1978 Sections 74-6-10 through -10.2, as amended from time to time, and is not subject to civil or criminal fines and/or penalties associated with permit requirements under Permit Sections 52 and 53.

~~47.~~50. **INSPECTION AND ENTRY** – The Permittees shall allow inspection by NMED of the Facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

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The Permittees shall allow NMED to have access to and reproduce any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations.

Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED in the WQA, the WQCC Regulations, or any other local, state or federal laws and regulations.

[NMSA 1978, §§ 74-6-9.B and 74-6-9.E, 20.6.2.3107.D NMAC]

~~48.~~51. **DUTY TO PROVIDE INFORMATION** - The Permittees shall, upon NMED's request, allow NMED to inspect and duplicate any and all records required by this Discharge Permit and furnish NMED with copies of such records.

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Nothing in this Discharge Permit shall be construed as limiting in any way the authority of NMED to gather information as stipulated in the WQA, the WQCC Regulations, or any other local, state or federal laws and regulations.

[NMSA 1978, §§ 74-6-5.D, 74-6-9.B, and 74-6-9.E, 20.6.2.3107.D NMAC, 20.6.2.3109.B NMAC]

~~49.~~52. **MODIFICATIONS AND AMENDMENTS**– In the event the Permittees propose a change to the Facility or the Facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the Facility, the Permittees shall notify NMED prior to implementing such changes. The Permittees shall obtain written approval (which may require modification of this Discharge Permit) from NMED prior to implementing such changes.

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[NMSA 1978, § 74-6-5.D, 20.6.2.3107.C NMAC, 20.6.2.3109.E NMAC,]

~~50.~~53. **EXTENSIONS OF TIME - The** Permittees may seek an extension of time in which to perform an obligation in this Discharge Permit, for good cause, by sending a written request for extension of time that states the length of the requested extension and describes the basis for the request. NMED shall respond in writing, stating the reasons for any denial.

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~~51.~~54. **CIVIL PENALTIES -** Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or Facility, or any refusal or failure to provide NMED with records or information, may subject the Permittees to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10.C and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the Permittees waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit.

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[NMSA 1978, §§ 74-6-10 and 74-6-10.1]

~~47.~~55. **CRIMINAL PENALTIES** – The WQA provides that no person shall:

a. Make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained in the WQA;
b. Falsify~~,~~ tamper with or render inaccurate any monitoring device, method or record required to be maintained in the WQA; or
c. Fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation.

Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15.

[NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]

~~52.~~56. **COMPLIANCE WITH OTHER LAWS** - Nothing in this Discharge Permit shall be construed in any way as relieving the Permittees of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.

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[20.6.2 NMAC]

~~53.~~57. **LIABILITY-** The Permittees shall be jointly and severally liable for all their obligations in this Discharge Permit.

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[NMSA 1978, §§ 74-6-5.A and 74-6-10]

~~54.~~58. **RIGHT TO APPEAL** - The Permittees may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC, shall be filed within thirty days of the receipt of this Discharge Permit, and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.
[NMSA 1978, § 74-6-5.O]

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~~55.~~59. **TRANSFER OF OWNERSHIP-** Prior to the transfer of any ownership, control, or possession of this Facility or any portion thereof, the Permittees shall:

a. Notify the proposed transferee in writing of the existence of this Discharge Permit;
b. Include a copy of this Discharge Permit with the notice; and
c. Deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee.

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Until both ownership and possession of the Facility have been transferred to the transferee, the Permittees shall continue to be responsible for any discharge from the Facility.

[20.6.2.3104 NMAC, 20.6.2.3111 NMAC]

~~56.~~60. **PERMIT FEES-** Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Payments shall be remitted to NMED no later than 30 days after the Discharge

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Permit effective date.

Permit fees are associated with issuance of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the Permittees of the obligation to pay all permit fees assessed by NMED. If the Permittees cease discharging at or from the Facility during the term of the Discharge Permit, they shall nevertheless pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the Permittees fail to remit payment when due.

[20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]

VII. Permit Term and Signature

EFFECTIVE DATE: [effective date]
TERM ENDS: [expiration date]
[20.6.2.3109.H NMAC, NMSA 1978, § 74-6-5.I]

____
JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

13036

Los Alamos
NATIONAL LABORATORY
EST 1943

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
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Date: MAY 20 2015
Symbol: ENV-DO-15-0137
LA-UR: 15-23614
Locates Action No.: N/A

Ms. Phyllis Bustamante, Acting Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2250
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Bustamante:

Subject: Draft Discharge Permit DP-1132 – Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility

This letter provides the responses of the United States Department of Energy and Los Alamos National Security, LLC (DOE/LANS) regarding issues identified during the April 16, 2015, meeting among representatives of the New Mexico Environment Department, Ground Water Quality Bureau (NMED), Citizens for Clean Water (CCW), Concerned Citizens for Nuclear Safety (CCNS), and DOE/LANS. In addition, this letter forwards a red-lined revision of the February 20, 2015, draft of DP-1132. The red-lined revision is attached to this letter as Enclosure 1. The attached red-lined revision (labelled 05/12/15 DOE/LANS REVISION) reflects the following proposed changes: (1) the language changes DOE/LANS had proposed on April 2, 2015, to Condition 24 (Waste Tracking), Condition 36 (SET Moisture Detection System Exceedance), Condition 43 (Stabilization of Individual Systems and Units), Condition 44 (Closure Plan); (2) the proposed new Conditions 47 (Integration with Consent Order) and 49 (Electronic Posting) DOE/LANS proposed on April 2, 2015; (3) a reorganization of certain conditions; and (4) some minor clarifications and typographic corrections.

Responses to issues from the April 16, 2015, meeting are set forth below.

1. Signage: At the April 16 meeting, representatives of CCW raised a question about the location and content of signs they would like to have posted in the area below Outfall 51. DOE/LANS propose revising Condition 6 of the February 20, 2015, draft permit to provide as follows:

   Condition 6. Signs – *The permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the Facility. Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet, Permittees shall include on the signs the following or an equivalent warning: DANGER – UNAUTHORZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS). The permittee shall post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility and the Pueblo of San Ildefonso.*

2. SET Liner System and Ultraviolet (UV) Resistance: Enclosure 2 provides the manufacturer's product data sheets for the following five components of the SET liner and moisture detection system: (1) primary liner (GSE Smooth Geomembrane–60 mil), (2) secondary liner (GSE Smooth Geomembrane–40 mil), (3) geonet drainage material between the primary and secondary liners (GSE Hypernet–250 mil), (4) geotextile material between the secondary liner and the concrete floor (GSE Nonwoven Geotextile–NW12), and (5) leak detection system between the primary and secondary liners (HYDRO-TEMP™ Early Warning Alarm (EWA) System).

   DOE/LANS contacted the manufacturer of the primary liner, GSE ENVIRONMENAL™, for information on the liner's UV resistance. GSE ENVIRONMENAL™ directed DOE/LANS to a 2011 white paper published by the Geosynthetic Institute, Folsom, PA, titled "Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions." A copy is attached as Enclosure 3 of this letter. Page 24 of the above-referenced white paper states, "HDPE geomembranes (per GRI-GM13) are predicted to have lifetimes greater than 36 years; testing is ongoing."

3. Settled Solids. The February 20, 2015, Draft of DP-1132 addresses Settled Solids in two separate permit conditions, Condition 9 (Settled Solids) and Condition 31 (Settled Solids Removal). As reflected in the DOE/LANS proposal to revise the draft of DP-1132 so that settled solids and settled solids removal are addressed in a single condition that appears as Condition 10 in the red-lined revision attached as Enclosure 1 to this letter.

4. "Likely to affect structural integrity of a unit or system" under Condition 11: The second paragraph of Condition 11 (Maintenance and Repair) in the February 20, 2015, Draft Permit states: "In the event that routine maintenance and repair reveal significant damage likely to affect the structural integrity of a unit or system or any of its associates components, or its ability to function as designed, the Permittees shall implement the contingency plan set forth in this Discharge Permit. "

The direction to "implement the contingency plan" is ambiguous since the "contingency plan" in the February 20, 2015, draft includes ten different numbered paragraphs covering a variety of subjects. Therefore, DOE/LANS have proposed language revisions and a reorganization of the draft permit, as reflected on Enclosure 1. The reorganization attempts to place related paragraphs together.

For example, Condition 13 (Maintenance and Repair) now provides that if routine maintenance and repair reveal "significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designated, the Permittee shall implement the requirements of Condition 14 (Damage to Structural Integrity) of this Discharge Permit."

5. SOP for Maintenance and Repairs: DOE/LANS have determined that it is not reasonable or appropriate to provide Standard Operating Procedures (SOPs) for maintenance and repairs of all equipment and systems at the RLWTF. The SOPs are voluminous and are subject to regular updating and revision.

6. Notification Under Condition 16 (Emergency Procedures): DOE/LANS believe that the revisions NMED made to the lettered subparagraphs of Condition 16 (Emergency Procedures) in the February 20, 2015, draft of DP-1132 are appropriate and that NMED should not reinstate the language of subparagraphs c through f as they appeared in the October 28, 2014, draft of DP-1132.

7. Measurement of TRU Waste Flow into the RLWTF: Condition 22 of the February 20, 2015, draft of DP-1132 accurately describes how TRU influent volumes to the RLWTF currently are measured. As that condition states, "permittees shall estimate the volume of TRU influent wastewater being conveyed to the Facility using electronic sensors which measure tank levels in both the acid waste and caustic waste influent tanks." Volumes "shall be determined by calculation using the head change and tank size. Operators shall record changes in influent tank levels whenever a batch of TRU wastewater is conveyed to the facility. The total daily and monthly volumes of TRU influent received by the facility shall be submitted to NMED in quarterly monitoring reports . . . ." This permit language was specifically negotiated and agreed to by NMED more than two years ago.

8. Flow Meter Accuracy Requirements: DOE/LANS have previously demonstrated that the language in Condition 18 of the February 20, 2015, draft of DP-1132 that "flowmeters shall be calibrated to within plus or minus ten percent of actual flow, as measured under field conditions" is consistent with NMED flow calibration policy. That policy provides that "flow measurement devices be calibrated in place, under actual operating conditions (field calibration) to within +/- 10% of the actual flow." *See* NMED Flow Meter Calibration (prepared by Robert George, NMED-GWQB) attached hereto as Enclosure 4. As DOE and LANS have further demonstrated, the plus or minus ten percent standard is also consistent with USEPA wastewater flow measurement procedures. *See* Operating Procedure, Wastewater Flow Measurement (August 12, 2001) Region 4, USEPA Science and Ecosystem Support Division (attached hereto as Enclosure 5).

9. Closure Plan: DOE and LANS will submit a closure plan to be included as a part of the permit. DOE and LANS currently anticipate that the plan will be submitted to NMED by December 31, 2015.

Please call Robert Beers at (505) 667-7969 if you have questions regarding this information.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
National Security Missions
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:RSB/ms

Enclosure: (1) Red-lined revision of the February 20, 2015, draft of DP-1132
(2) SET liner and leak detection system product data sheets
(3) Geomembrane Lifetime Prediction, Geosynthetic Institute White Paper #6
(4) NMED Flow Meter Calibration (prepared by Robert George, NMED-GWQB)
(5) USEPA wastewater flow measurement procedures

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Jennifer Hower, NMED/OGC, Santa Fe, (E-File)
Jonathan Block, CCW, Santa Fe, (E-File)
Lindsay Lovejoy, CCNS, Santa Fe, (E-File)
Joni Arends, CCNS, Santa Fe, (E-File)
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Amy E. De Palma, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Randal S. Johnson, DSESH-TA55, (E-File)
Stephen G. Cossey, DSESH-TA55, (E-File)
Leslie K. Sonnenberg, TA-55-RLW, (E-File)
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ENCLOSURE 1

Red-lined revision of the February 20, 2015, draft of DP-1132

ENV-DO-15-0137

LA-UR-15-23614

Date: MAY 20 2015

ENV-DO-15-0137 **ENCLOSURE 1** **LA-UR-15-23614**

DRAFT GROUND WATER DISCHARGE PERMIT (DP-1132)
RADIOACTIVE LIQUID WASTE TREATMENT FACILITY
LOS ALAMOS NATIONAL LABORATORY

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I. ACRONYMS:

The following acronyms and abbreviations may be used throughout this Discharge Permit:

- BOD_5-biochemical oxygen demand (5-day)
- CAS-Chemical Abstract Service
- CFR-Code of Federal Regulations
- Cl- chloride
- CQCAP- Construction Quality Control Assurance Plan
- DOE-United States Department of Energy
- EPA- United States Environmental Protection Agency
- gpd-gallons per day
- LANL-Los Alamos National Laboratory
- LANS- Los Alamos National Security, LLC
- MES-Mechanical Evaporator System
- Mg/L-milligrams per liter (or parts per million)
- NMAC-New Mexico Administrative Code
- NMSA-New Mexico Statues Annotated
- NO_3-N-nitrate-nitrogen
- NPDES-National Pollutant Discharge Elimination System
- PCBs-Polychlorinated Biphenyls
- QA/QC-Quality Assurance/Quality Control
- RLW-Low-level radioactive waste water
- RLWTF-Radioactive Liquid Waste Treatment Facility
- SET-Solar Evaporative Tank System
- TA-Technical Area
- TDS-total dissolved solids
- TKN-total Kjeldahl nitrogen
- TRU-Transuranic
- TSS-total suspended solids
- WQA-Water Quality Act
- WQCC-Water Quality Control Commission

II. DEFINITIONS:

The following is a list of definitions as they pertain specifically to this Discharge Permit:

A. **Average daily flow-** the rate determined by dividing the total monthly volume by the number of days for the reporting period.

B. **Active portion-** the portion of the Facility where treatment, storage or disposal of waste water occurs or has occurred in the past, including those portions of the Facility which are not in use and have not been closed in accordance with the conditions in this Discharge Permit.

C. **Calibration** – a comparison between an instrument of known magnitude or correctness (standard) and another measurement made in as similar a way as possible with a second device (test instrument).

D. **Closure-** to permanently discontinue the use of a unit, system, or component of the Facility (partial) or the entire Facility (final).

E. **Construction Quality Control Assurance Plan-** a written plan of activities necessary to ensure that construction and installation meet design criteria. A CQCAP includes practices and procedures for inspections, testing and evaluations of material and workmanship necessary to verify the quality of the constructed unit or system, and corrective actions to be implemented when necessary.

F. **Discharge-** the intentional or unintentional release of an effluent or leachate which may move directly or indirectly into ground water or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property.

G. **Effluent-** a liquid waste product resulting from the treatment or partial treatment of an influent waste stream intended to be discharged.

H. **Exfiltration-** the uncontrolled passage or penetration of waste water or sludge from a structural component of a unit or system through defective pipes, pipe joints, connections, cracks, structural failure, or material incompatibility and enters the surrounding environment.

I. **Flow meter-** a quantitative instrument or device that measures, displays, and records the flow of a fluid in a conduit or an open channel.

J. **Freeboard**-the vertical distance between the crest of the embankment and the carrying capacity level of an open tank, impoundment, or other open unit that contains a liquid or semi-liquid

K. **Impoundment-** a unit which is a natural topographic depression, man-made excavation, or diked area primarily constructed of earthen materials, specifically designed to hold, evaporate or store, an accumulation of liquid or semi-liquid waste.

L. **Industrial waste water-** the liquid wastes from industrial processes or non-household waste water which is generated through activity not solely derived from human excreta, residential sinks, showers, baths, clothes and dish-washing machines; or exceeds the characteristics of a domestic waste as defined in 20.7.3.7.D(6) NMAC; 300 mg/L BOD, 300 mg/L TSS, 80 mg/L total nitrogen or 105 mg/L fats, oils and grease.

M. **Infiltration-** the uncontrolled passage or penetration of liquids or semi-liquids into a unit or system through defective pipes, pipe joints or connections, or manhole walls. cracks, structural failure, or material incompatibility.

N. **Influent collection system-** the infrastructure and associated components (e.g.

sumps, pumps) used for the collection and conveyance of waste water from the originator to the Facility's treatment systems.

O. **Influent-** untreated water, waste water or other liquid or semi-liquid flowing into a reservoir, basin, or treatment plant.

P. **Leak detection system-** a system capable of detecting the failure of either the primary or secondary containment structure or the presence or release of an accumulated liquid in the secondary containment structure. The system must employ operational controls or consist of an interstitial monitoring device designed to detect continuously and automatically the failure of the primary or secondary containment structure or the presence of a release into the secondary containment structure.

Q. **Maintenance and repair-** all actions associated with keeping a system or component functioning as designed or restoring a system or component to its intended function. Maintenance and repair does not include alterations to a unit or system which change the intended function or design of the unit or alter the treatment process.

R. **Maximum daily discharge-** the total daily volume of waste water (expressed in gallons per day) authorized for discharge by a discharge permit.

S. **Open unit or system-** a unit or system designed to store, treat or dispose of liquids, semi-liquids or solids to which the uppermost portion of the unit is exposed.

T. **Outfall-** the point where a treated waste water discharges to waters of the United States, or a tributary to waters of the United States.

U. **Peak instantaneous flow-** the highest design flow rate for a unit or system, expressed in gallons per minute or cubic feet per second.

V. **Record drawings-** the official record of the actual as-built conditions of the completed construction, to be held as the permanent record of each unit and system, which shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

W. **Secondary containment-** a constructed unit or system designed to prevent any migration of waste streams or accumulated liquid out of the unit or system to the soil, ground water, or surface water at any time. Secondary containment can include, but is not limited to: double-walled pipes, concrete and floors equipped with sumps and alarm systems to detect potential leaks and must be:
- Designed, constructed and maintained to surround the unit on sides and bottom;
- Free of cracks, gaps, or fissures;
- Constructed of, or lined with, materials that are compatible with the waste streams to be in contact with the unit or system;
- Placed on a foundation or base capable of withstanding pressure gradients, settling or uplift which may cause failure of the unit or system; and
- Equipped with a leak detection system that is designed and operated so that it will detect the failure of the primary containment structure;

X. **Settled solids measurement device-** an apparatus for testing settled solids in a liquid suspension for settling rate, compaction of the settled solids, and the resulting clarity of the liquid.

Y. **Sludge or settled solids-** a solid or semisolid residue that results from the treatment or precipitation of solids from a waste stream, or the accumulation of natural sediment and debris settling in an open unit or system.

Z. **Synthetic Liner-** a continuous layer of man-made materials, beneath or on the sides

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of a unit or system, which restricts the downward or lateral escape of effluent or leachate.

AA. Tank- a stationary device, designed to contain an accumulation of waste water which is constructed primarily of non-earthen materials (e.g., concrete, steel, plastic) which provide structural support. Tanks can be further identified as either an **On ground tank** meaning a tank that is situated in such a way that the bottom of the tank is on the same level as the adjacent surrounding surface allowing for visual inspection of the vertical walls but not the external tank bottom, an **In-ground tank** meaning a tank constructed or installed so that a portion of the tank wall is situated to any degree within the ground, thereby preventing visual inspection of that portion of the external surface area, or an **Aboveground tank** meaning a tank that is completely elevated above the adjacent surrounding surface allowing for visual inspection of the vertical walls and external tank bottom.

BB. Total Nitrogen- The sum of total Kjeldahl nitrogen (TKN) and nitrate-nitrogen (NO_3-N).

CC. Toxic Pollutant- a water contaminant or combination of water contaminants in concentration(s) which, upon exposure, ingestion, or assimilation either directly from the environment or indirectly by ingestion through food chains, will unreasonably threaten to injure human health, or the health of animals or plants which are commonly hatched, bred, cultivated or protected for use by man for food or economic benefit; as used in this definition injuries to health include death, histopathologic change, clinical symptoms of disease, behavioral abnormalities, genetic mutation, physiological malfunctions or physical deformations in such organisms or their offspring; in order to be considered a toxic pollutant a contaminant must be one or a combination of the potential toxic pollutants identified in the list in 20.6.2.7.WW NMAC and be at a concentration shown by scientific information currently available to the public to have potential for causing one or more of the effects listed above; any water contaminant or combination of the water contaminants identified in the list in 20.6.2.7.WW NMAC creating a lifetime risk of more than one cancer per 100,000 exposed persons is a toxic pollutant.

DD. Treatment- any method, technique or process that, through chemical biological and mechanical processes, modify waste water characteristics with the objective to neutralize and reduce or remove organic and inorganic water contaminants which if released to the environment could potentially impact ground water quality or pose a threat to human health.

EE. Unauthorized Release or spill- the intentional or unintentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil or other water contaminant not authorized in this Discharge Permit.

FF. Water Contaminant - any substance that could alter if discharged or spilled the physical, chemical, biological or radiological qualities of water; "water contaminant" does not mean source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954.

III. Introduction

The New Mexico Environment Department (NMED) issues this Discharge Permit (Discharge Permit), DP-1132, to the United States Department of Energy (DOE) and to Los Alamos National Security, LLC (LANS) (collectively the Permittees) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge, and potential release, of water contaminants from the Los Alamos National Laboratory~~'s~~ (LANL~~'s~~) Radioactive Liquid Waste Treatment Facility (Facility) so as to protect public health, ground water for present and potential future use as a domestic water supply or an agricultural water supply, and those segments of surface water gaining from ground water inflow. In issuing this Discharge Permit, NMED has determined that the requirements of 20.6.2.3109.C NMAC have been or will be met.

The application (i.e., discharge plan) consists of the materials submitted by the Permittees on August 19, 1996, an updated application submitted to NMED on February 16, 2012, an amendment to the application submitted to NMED on August 10, 2012, and materials contained in the administrative record prior to issuance of this Discharge Permit.

The Facility is located within Los Alamos National Laboratory, approximately 1.5 miles south of Los Alamos, New Mexico, in Sections 16, 17, 20, 21 and 22, Township 19N, Range 06E, Los Alamos County. Ground water most likely to be affected ranges from depths of approximately one foot to 1,306 feet and has a total dissolved solids concentration ranging from approximately 162 to 255 milligrams per liter.

The Facility, as it pertains to conditions within this Discharge Permit (DP-1132), is a wastewater treatment facility that is authorized to discharge up to 40,000 gallons per day (gpd), specifically described in section V(D) of this Discharge Permit and includes the influent collection system, the low-level radioactive liquid waste treatment system, the transuranic waste water treatment system, the secondary treatment system, the Mechanical Evaporator System (MES), the Solar Evaporative Tank System (SET) and an outfall (Outfall 051) also regulated by a National Pollutant Discharge Elimination System (NPDES) permit issued by the United States Environmental Protection Agency (EPA) pursuant to the federal Clean Water Act Section 402, 33 U.S.C § 1342. The discharge may contain water contaminants with concentrations above the standards of 20.6.2.3103 NMAC and may contain toxic pollutants as defined in 20.6.2.7.WW NMAC.

Pursuant to 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or that the standards of 20.6.2.3103 NMAC are being or may be violated or a toxic pollutant as defined in 20.6.2.7.WW NMAC is present. Such modifications may include, without limitation, the implementation of structural controls, treatment processes, monitoring criteria, operational processes, changes in discharge

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activities and the abatement of water pollution and remediation of ground water quality.

Issuance of this Discharge Permit does not relieve the Permittees of the responsibility to comply with the WQA, WQCC Regulations, and all other applicable federal, state, and local laws and regulations.

IV. Findings

In issuing this Discharge Permit, NMED finds:

A. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.

B. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of total dissolved solids (TDS) within the meaning of 20.6.2.3101.A NMAC.

C. The discharge from the Facility is within or into a place of withdrawal of ground water for present or reasonably foreseeable future use within the meaning of the WQA, NMSA 1978, § 74-6-5.E.3, and the WQCC Regulations at 20.6.2.3103 NMAC

D. The discharge from the Facility to Outfall 051 is subject to the exemption set forth in 20.6.2.3105.F NMAC, to the extent that effective and enforceable effluent limitations (not including monitoring requirements) are imposed, unless the NMED Secretary determines that a hazard to public health may result.

V. Authorization to Discharge

A. Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the Permittees to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

B. The Permittees are authorized to discharge up to 40,000 gpd of low-level and transuranic radioactive industrial waste water using a series of treatment processes as described in Section V(D) of this Discharge Permit in accordance with the Conditions set forth in Section VI of this Discharge Permit.

C. The Permittees are authorized to discharge up to 40,000 gpd of treated waste water, in accordance with the Conditions set forth in Section VI of this Discharge Permit. Discharges shall be to either the Mechanical Evaporator System (MES), the synthetically lined Solar Evaporative Tank S~~s~~ystem (SET), or through an outfall (identified as Outfall 051) also regulated by a National Pollutant Discharge Elimination System (NPDES) permit (Permit No. NM0028355) issued by the United States Environmental Protection Agency [20.6.2.3104 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC].

D. The Permittees are authorized to use the following defined systems with their associated units for the process of treating and disposing of waste water:

The Influent Collection System is defined herein as all primary and secondary containment lines that convey transuranic or low-level radioactive waste water from Technical Areas TA-03, TA-35, TA-48, TA-50, TA-55, and TA-59 to the Transuranic Waste (TRU) treatment system and the Low-level Radioactive waste water (RLW) treatment system at TA-50. It includes the conveyance lines beginning at the point the pipe emerges from the building or other structure that comprises the site of generation, and extending to the vault immediately upstream of the influent tanks at TA-50. It also includes the conveyance of low-level radioactive waste water to the RLW treatment system by truck.

The Low-level Radioactive Waste W~~w~~ater (RLW) Treatment System is defined herein as the low-level radioactive waste water influent storage tanks, the associated treatment units (filters, feed tanks, ion exchange columns, reverse osmosis units, etc.) effluent storage tanks, and other associated low-level radioactive waste water components at TA-50. The process by which the individual treatment units within the low-level radioactive treatment system are utilized may, for attaining compliance with the effluent limits set forth in this Discharge Permit, be altered, by-passed, replaced, or removed in accordance with the Conditions set forth in this Discharge Permit. The physical location of each unit and system that conveys, stores, or treats RLW waste streams coming into the low-level radioactive waste water treatment system is within TA-50.

The Transuranic (TRU) Waste Water Treatment System is defined herein as the influent storage tanks for each form of TRU (acidic and caustic) wastestreams, the associated neutralization unit, pressure filters, the final processing tanks, and other associated TRU wastestream conveyance, storage and treatment components at TA-50. Sludge associated with TRU shall be disposed of at an off-site facility permitted to receive TRU waste.

The Secondary Treatment System is defined herein as the receiving tanks for reverse osmosis concentrate waste water generated through the RLW Treatment System and treated effluent generated from the TRU Treatment System, the treatment process units for secondary reverse osmosis, the rotary vacuum filter, and other associated post-treatment conveyance, storage and treatment components at TA-50 designed to reduce wastestream volumes.

The Mechanical Evaporator System (MES) is defined herein as the units in which treated RLW effluent is disposed of through natural gas generated mechanical evaporation.

The Solar Evaporative Tank System (SET) is defined herein as the single concrete tank unit at TA-52 that receives treated effluent from the RLWTF, and the conveyance line from TA-50. The SET consists of two cells separated by a single partitioned wall; each cell has a containerized volume of approximately 380,000 gallons. The SET is an unsealed subgrade concrete structure with a ~~single~~ double-lined synthetic liner, and a leak detection system within the synthetic liner.

Comment [SH1]: Grammatical correction by SMH

Outfall 051 is defined herein as the outfall through which treated waste water from the Facility is discharged to Effluent Canyon, which is a tributary to Mortandad Canyon.

[20.6.2.3104 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC].

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VI. Conditions

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

A. Operational Plan

1. **ANNUAL UPDATE**-The Permittees shall submit to NMED ~~and shall post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ an updated Facility Process Description annually by February 1 of each year. ~~The posting of this information and other information as stipulated throughout this permit shall be voluntary, and as such, not enforceable under NMAC 20.6.2.1220.~~ The annual Facility Process Description shall include the following:
   a. A schematic of all major structures associated with the Facility, including all influent lines, buildings, exterior tanks, effluent lines, outfalls and discharge locations identified in this Discharge Permit.
   b. A comprehensive flow chart demonstrating the most current processes in operation for the collection, treatment and disposal of waste water for the Facility. The flow chart shall indicate any processes which have been by-passed, decommissioned, or are no longer used for the collection, treatment or final disposal of the waste water.
   c. An associated narrative describing each of the systems and treatment units outlined in the flow chart. This narrative shall include the collection system, primary treatment units, secondary treatment units and any systems used in the disposition of any associated waste streams at the Facility. For each unit or system, the narrative shall include:
      1) The identification of the unit or system;
      2) The physical location;
      3) Intended function;
      4) Physical description;
      5) Operational capacity, if applicable;
      6) The date the unit or system was placed in operation;
      7) Origin of waste streams that the unit or system receives; and
      8) The unit or system(s) to which it discharges.
   d. The Annual Update shall also include the following documents to be submitted annually by February 1 of each year.
      1) Summary of maintenance and repairs made during the reporting period;
      2) Water Tightness Testing results (VI.A.8);
      3) Settled Solids measurements (VI.A.9); and
      4) Ground Water Flow report (VI.A.2~~7~~6)

   [20.6.2.3106.C NMAC]

2. **NOTIFICATION OF CHANGES**-The Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at~~

~~http://eprr.lanl.gov/oppie/service (or as updated)~~ a written notification of any changes in the Facility's collection, treatment or disposal systems which are not maintenance and repair (as defined in this permit Section II), and which are not significant modifications (covered in this permit Section VI.A.3). The notification shall be submitted no less than thirty days prior to the date proposed for implementation. The notification shall include, at a minimum, the following items listed herein and others which may be determined to be required by NMED:

a. Date process change is planned to be implemented;
b. Narrative of process change;
c. Justification for making the process change;
d. Units or components being removed from the process;
e. Units or components being incorporated into the process;
f. Operational controls implemented for the change in processes;
g. Intended duration of process change (e.g., permanent or limited duration).

LANL shall submit to NMED and add to the posting described in this Subsection any follow-up material required later by NMED, after NMED's review of a notification.
[20.6.2.3106.C NMAC]

3. **SUBMITTAL OF PLANS AND SPECIFICATIONS**-The Permittees shall not implement any expansion, process modification, or alteration of a system or unit that could constitute a discharge permit modification (as defined in 20.6.2.7.P NMAC) of the intended function, design or capacity for any of the systems, units or components of the Facility's collection, treatment or disposal systems without prior written approval by NMED. Prior to implementing any such changes, the Permittees shall submit to NMED for approval a written proposal, including plans and specifications that describes in detail the proposed changes in the processes or components of the Facility's collection, treatment, or disposal systems. The proposal shall be delivered by certified mail or hand delivery. The Permittees shall not place any waste in a new or changed unit or system unless the Permittees receive prior written approval from NMED. NMED will provide such approval only if it finds that the Permittees have submitted the required elements listed herein in sufficient detail to demonstrate that the unit or system is designed and constructed to minimize the possibility of an unauthorized release of water contaminants which could directly or indirectly impact ground water quality or pose a threat to human health. If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, Permittees ~~LANL~~.

The proposal shall include, at a minimum, the following information:

a. Identification of all applicable units and a description of how they will be constructed;
b. A map, to scale, of the Facility, with the location of the proposed unit relative to other identified structures or systems referenced in this

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Discharge Permit;

c. Specifications for all new unit and system components (e.g., lift stations, valves, transfer lines, process units and associated details); whether new, retrofitted, or proposed for abandonment. All new system components for the collection, treatment or disposal of waste water at the Facility shall be designed to meet the projected needs of the Facility;
d. Plans and specifications for proposed flow meters that will be used to measure the volume of waste water discharged to or from the unit or system;
e. Demonstration that the proposed unit or system is adequately designed for its intended function;
f. Compatibility of the unit or system's constructed material with the proposed waste stream, including, if applicable, information regarding corrosion protection to ensure that it will maintain its structural integrity and not collapse, rupture or fail;
g. Certification that the foundation, structural support, seams, connections, and pressure controls, if applicable, are adequately designed and the unit or system has sufficient structural strength to convey, store, treat or dispose of the intended waste stream;
h. Certification for all plans and specifications attesting to the capacity of the unit or system including, without limitation, waste water flow data derived using both average daily flow and peak instantaneous flow. Computations should be presented in a tabular form showing depths and velocities at minimum, design average, and peak instantaneous flow for all new system components;
i. Water balance calculations for the capacity and evaporative potential for units which are subject to exposure to the environment and to which precipitation events may impact total capacity of the unit. The unit shall be designed such that two feet of freeboard or an NMED approved alternative is maintained at all times;
j. Design specifications for secondary containment for all units or systems intended to convey, store, treat, or dispose of liquid or semi-liquid waste streams;
k. Design specifications for leak detection systems associated with systems designed to convey, store, treat, or dispose of liquid or semi-liquid waste streams, which demonstrate the capability of detecting the failure of either primary or secondary containment or the presence of any release of any accumulated liquid in the secondary containment system within the earliest practicable time as approved in advance by NMED;
l. Proposed leakage tests shall be specified for all new unit or system components with direct contact to treated or untreated waste water. This may include appropriate water or low pressure air testing. The use of a camera or other visual methods used for documentation of the inspection, prior to placing the unit or system in service is recommended;
m. Design specifications for all units or systems designed to convey, store, treat, or dispose of liquid or semi-liquid waste streams, which demonstrate

the ability to remove liquids and semi-liquids from the area of containment within the earliest practicable time as approved in advance by NMED; and

n. A Construction Quality Control Assurance Plan (CQCAP) assuring that the proposed unit or system will meet or exceed all design criteria and specifications.

Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978) as well as applicable DOE and LANL Engineering Standards. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.1202 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

4. **CONSTRUCTION REPORT**-Within 90 days following completion of construction for a unit or system that requires NMED approval, the Permittees shall prepare a final construction report that contains the following:
   a. A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes);
   b. Description of the procedures and results from all inspection and tests that occur before, during, and after construction to ensure that the construction materials and the installed unit or system components meet the design specifications; and
   c. A complete copy of the Operation and Maintenance Manual, specific to the unit or system being constructed.

~~The Permittees' final construction report shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[20.6.2.1202 NMAC, 20.6.2.3109.C NMAC, 20.6.2.3106.C NMAC, 20.6.2.3107.C NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

5. **RESTRICTING ENTRY**-The Permittees shall, at all times, prevent the unauthorized entry of persons, wildlife, or livestock into the active portions of this Facility (with the exception of Outfall 051) so that physical contact with the waste streams, structures and equipment is restricted. Means to control unauthorized access shall include an artificial or natural barrier which completely surrounds the active portions of the Facility and a means to control entry, at all times, through gates or other entrances to the active portions of the

Facility (e.g., locks, surveillance system).

[20.6.2.3109.C NMAC]

6. **SIGNS**-The Permittees shall post and maintain signs at each entrance to the active portions of the Facility (with the exception of Outfall 051) and at other locations, in sufficient numbers to be seen from any approach to the active portions of the Facility stating that access is limited to Authorized Personnel ~~o~~Only. All signs shall be posted in English and Spanish and be legible from a distance of at least 25 feet.

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[20.6.2.3109.C NMAC]

7. **VERIFICATION OF SECONDARY CONTAINMENT**-Within 180 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ verification demonstrating all units and systems intended to convey, store, treat or dispose of an untreated liquid or semi-liquid waste streams meet the requirements of secondary containment as defined in this Discharge Permit. Verification must also include certification of an operational leak detection system for the unit or system.

[20.6.2.3106.C NMAC, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

8. **WATER TIGHTNESS TESTING**-Within ~~540~~180 days following the effective date of this Discharge Permit (by DATE), and every 540 days thereafter, the Permittees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use. To make the demonstration, the Permittees shall conduct both a visual test, for those units and systems that are above-ground and visually inspectable, and a quantifiable test, as applicable.

For units and systems that are above-ground and visually inspectable, the visual assessment shall be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks and leaks. If necessary, the Permittees shall remove the stored waste from the unit or system to allow the condition of internal surfaces to be assessed.

The quantifiable assessment for units and systems that are used to store, treat or dispose of liquid or semi-liquid waste streams shall consist of obtaining tank level measurements over at least a 36 hour period during which no liquid or semi-liquid is added to or removed from the unit. The exfiltration or infiltration rate shall not exceed 0.07 gallons per hour per thousand gallons of capacity for the unit or system.

The quantifiable assessment for units and systems designed to convey a liquid or semi-liquid waste stream shall be determined through passive testing for leakage exfiltration and infiltration. The infiltration or exfiltration rate shall not exceed 50 gallons per mile per consecutive 24 hour period for any section of the system. Infiltration and exfiltration tests for conveyance lines shall be conducted as follows:

a. Prior to testing for infiltration, the conveyance lines shall be isolated and evacuated so that maximum infiltration conditions exist at the time of testing. The Permittees shall measure and document the volume of infiltration entering each section of the conveyance line being tested. The cumulative results for the entire collection system shall not be a satisfactory method for gauging infiltration compliance.

b. Prior to testing for exfiltration, the conveyance lines shall be isolated and filled with water to a level that produces, at minimum, two feet of hydrologic head above the uppermost point of the section being tested. The cumulative results for the entire collection system shall not be a satisfactory method for gauging exfiltration compliance.

Demonstration of water tightness shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978). The Permittees shall submit to NMED~~, and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated),~~ the procedures and findings of the evaluation by February 1 of each year immediately following the date when the water tightness test was performed. In the event that inspection reveals that the criteria for leakage is greater than permissible in this Discharge Permit, the Permittees shall implement the requirements of Condition 9 (Actual or Threatened Water-Tightness Failure) ~~contingency plan set forth~~ in this Discharge Permit.

[20.6.2.3106.C NMAC, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

9. **ACTUAL OR POTENTIAL WATER-TIGHTNESS FAILURE**-In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:
   a. If the unit or system failure resulted in an unauthorized release the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:.
      1) The Permittees shall remove the unit or system from service immediately; and
      2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for

approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.

If repair or replacement of a unit or system requires construction, the Permittees shall submit plans and specifications to NMED with the proposed corrective actions. Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

Upon NMED approval, the Permittees shall implement the approved corrective actions according to the approved schedule.

Prior to placing a repaired or replaced unit or system back into service, the Permittee shall repeat the water-tightness testing in accordance with Condition 8 to verify the effectiveness of the repair or replacement, and submit a report detailing the completion of the corrective actions to NMED. The report shall include the date of the test, the name of the individual that performed the test, written findings, photographic documentation of the unit's interior and water tightness test results. If notified to do so by NMED, the Permittees shall also submit record drawings that include the final, construction details of the unit. Record drawings shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]

~~9.~~10. **SETTLED SOLIDS; SETTLED SOLIDS REMOVAL~~-~~**The Permittees shall inspect and measure the thickness of the settled solids in the SET and MES (if applicable)~~,~~ on an annual basis for all open units and systems that are designed to store or dispose of a liquid or semi-liquid through evaporation. The Permittees shall measure the thickness of settled solids in accordance with the following procedure:

a. The total surface area of the unit or system shall be divided into nine equally sized areas.
b. A settled solids measurement device shall be utilized to obtain one settled solids thickness measurement (to the nearest half-foot) per area.
c. The individual settled solids depths for each of the nine measurement areas shall be averaged.

The Permittees shall record all measurements in an inspection log which must include, at a minimum, the following:

a. Date and time of the inspection;
b. The name of the inspector;
c. Identification of the unit;
d. The location of the unit;
e. The estimated total volume of liquid or semi-liquid in the unit or system at

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the time of inspection;

f. The total depth capacity of the unit or system (allowing for ~~with respect to~~ freeboard requirements);

g. The method used to determine the settled solids depth; and

h. The average measured depth of settled solids in the unit.

The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average ~~volume~~ depth greater than one foot. In the event that the settled solids accumulation in an open unit or system exceeds an average depth of one foot, or in the event that the Permittees otherwise plan to initiate removal of settled solids from an open unit or system, the Permittees shall propose a plan for the removal and disposal of the settled solids from the unit or system. At least 120 days prior to any settled solids removal, the Permittees shall submit to NMED for approval a written settled solids removal and disposal plan. The plan shall include characterization of the settled solids, the estimated volume of settled solids to be removed, a method for removal throughout the unit or system in a manner that is protective of the structural integrity of the unit or system, a schedule for completing the settled solids removal and disposal, and a description of how the settled solids will be contained, transported, and disposed of in accordance with all local, state, and federal laws and regulations. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. ~~settled solids volumes depth exceeds the volumes depth defined in this Discharge Permit or upon implementation of any settled solids removal activity, the Permittees shall implement the contingency plan set forth in this Discharge Permit~~.

The Permittees shall keep the inspection log on site for a minimum of five years from the date of inspection. The Permittees shall submit a summary report of all settled solids depth results to NMED by February 1 of each year. ~~The Permittees' summary report shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.C NMAC, 20.6.2.3107.A NMAC]

~~10.~~11. **FACILITY INSPECTIONS-**The Permittees shall inspect the Facility for malfunctions, deterioration, leaks or spills which may be causing, or may lead to, an unauthorized release to the environment or pose a threat to human health.

The inspection shall be performed at the frequency prescribed for each unit or system in this Discharge Permit or based on the rate of deterioration of the equipment and the probability of an environmental or human health incident for those units and systems not specifically described herein.

a. The Permittees shall inspect and test all leak detection systems to ensure

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performance within manufacturer specifications on a monthly basis.

b. The Permittees shall inspect all externally observable portions of units and systems conveying, treating or storing liquids, semi-liquids, or solids including any secondary containment areas on a weekly basis. The Permittees shall examine for evidence of deterioration or failure of the units and systems. The visible portions of all synthetic liners used to store or dispose of liquids or semi-liquids shall be inspected for uniformity, damage, imperfections, punctures, blisters, and evidence of seam or joint failure on a monthly basis.

c. The Permittees shall inspect, on a weekly basis through indirect observation, all units and systems conveying, processing, or storing liquids, semi-liquids, or solids that are inaccessible or otherwise cannot be directly observed. The Permittees shall identify the unit or system and note any potential findings which may suggest a breach or failure of containment.

d. The Permittees shall inspect all open units and systems which contain a liquid or semi-liquid, on each day during which the Facility is in operation, to ensure capacity of the unit or system is not exceeded.

The Permittees shall record all inspections in an inspection log which shall be kept on site for a minimum of five years from the date of inspection. At a minimum, these inspections shall include the date and time of the inspection, the name of the inspector, identification of the unit, the location of the unit, the total volume of liquid or semi-liquid in the unit or system at the time of inspection, a notation of the observations made, and the date and nature of any maintenance and repairs made.

~~In the event that inspection findings reveal significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall implement the contingency plan set forth in this Discharge Permit.~~

[20.6.2.3107.A NMAC]

12. **CONTAINMENT**-The Permittees shall institute corrective actions, as necessary, to ensure the protection of ground water and human health. In the event that a unit or system or secondary containment for a unit or system reveals damage that could result in structural failure or a release to the environment, the Permittees shall take the following actions:

a. The Permittees shall remove the unit or system from service immediately.

b. The Permittees shall take immediate, and if necessary temporary, corrective actions to minimize the potential for a release.

c. Within 90 days following identification of the potential failure, the Permittees shall submit to NMED for approval a written corrective action report to include, at minimum, the following:

1) Identification of the unit or system, or secondary containment for a

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unit or system in which the failure was observed.
2) The date and time the failure was observed and the date and time it was estimated to have begun.
3) The potential cause of the failure.
4) For units in which a release occurred to secondary containment but was not released to the environment, the rate at which the release occurred and total volume released to the secondary containment.
5) The characteristics of the waste stream being treated, stored or conveyed by the unit or system, with analytical results from waste stream samples taken with date, time, technical staff collecting the sample and the lab report with QA/QC.
6) The corrective actions taken to remediate the failure or release with a timeline of when actions were implemented.
7) Long-term actions, if any, that are proposed to be employed for maintaining the integrity of the secondary containment and the schedule for implementing such actions.
8) Ongoing measures for monitoring, inspecting, and determining structural integrity of the secondary containment.
9) Proposed operation and maintenance and repair protocol, if applicable, to be instituted to prevent future failures.

d. If failure of the unit or system or secondary containment resulted in a release to the environment, the Permittees shall comply with the requirements of Condition 38 (Spill or Unauthorized Release) of this Discharge Permit.

Upon NMED approval of the corrective action report, the Permittees shall implement any approved long-term actions to maintain the integrity of the secondary containment, and any other approved measures or protocols, according to the approved schedule.

new language

[20.6.2.3107.A NMAC]

~~11.~~13. **MAINTENANCE and REPAIR**-The Permittees shall maintain the function and structural integrity of the Facility at all times except during maintenance or repair. All routine maintenance and repair actions shall be noted in a maintenance log which shall be kept on site for a minimum of five years. Maintenance and repair of a unit or system required due to potential malfunction which could lead to an unauthorized discharge to the environment or pose a threat to human health shall be corrected as soon as possible, but no later than 30 days from the date of the observed malfunction. For good cause, NMED may approve a longer period. The Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ a report which summarizes and describes the maintenance and repair activities performed on the Facility as part of the quarterly monitoring reports.

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In the event that routine maintenance and repair reveal significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall implement the requirements of Condition 14 (Damage to Structural Integrity) of ~~contingency plan set forth in~~ this Discharge Permit.

[20.6.2.3107.A NMAC]

14. **DAMAGE TO STRUCTURAL INTEGRITY**-In the event that an inspection required in this Discharge Permit, or any other observation, reveals significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall notify NMED orally within 24 hours, and shall propose the repair or replacement of the treatment system or its associated components. Within 90 days after discovery by the Permittees or following notification from NMED that corrective action is required, the Permittees shall submit to NMED for approval a written corrective action plan that includes a schedule for implementation and completion. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees shall remedy any deterioration or malfunction of equipment or structures which are discovered during inspection.

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[20.6.2.3107.A NMAC]

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~~12.~~15. **FREEBOARD; FREEBOARD EXCEEDANCE**-The Permittees shall maintain two feet of freeboard in all open units and systems that contain a liquid or semi-liquid. If the Permittees determine that two feet of freeboard cannot be maintained, the Permittees shall submit to NMED for approval a written request for alternate freeboard requirements. In the request the Permittees shall, at a minimum, propose freeboard levels that will be maintained and propose demonstrated spill prevention controls and overfill prevention controls that include the prevention of overtopping by wave, wind or precipitation events. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

In the event that established freeboard of ~~is not maintained, the Permittees shall implement the contingency plan set forth in this Discharge Permit.~~ two feet or an NMED approved alternative, is not maintained in an open tank, impoundment or other open unit or system that contains a liquid or semi-liquid, the Permittees shall take immediate corrective actions to restore the required freeboard.

In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the Permittees shall submit to NMED for approval a proposed corrective action plan to restore the required freeboard

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within 15 days following the date when exceedance of the required freeboard was initially discovered. The plan shall include a schedule for completion of corrective actions and quantifiable assessments to demonstrate preservation of the required freeboard for a period no less than five years. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B & .C NMAC]

~~13.~~16. **EFFLUENT LIMITS: OUTFALL 051**-The Permittees shall not discharge treated waste water to Outfall 051 that exceeds the following limits (or is outside the following pH range):

a. All water contaminants and their associated limits as listed in Table 1.

Table 1. Effluent Quality Limits for Discharges to Outfall 051

Inorganic Chemicals:	CAS#	mg/L
Aluminum (dissolved)	7429-90-5	5.0
Arsenic (dissolved)	7440-38-2	0.1
Barium (dissolved)	7440-39-3	1.0
Boron (dissolved)	7440-42-8	0.75
Cadmium (dissolved)	7440-43-9	0.01
Chromium (dissolved)	7440-47-3	0.05
Chloride (dissolved)	7647-14-5	250.0
Cobalt (dissolved)	7440-48-4	0.05
Copper (dissolved)	7440-50-8	1.0
Cyanide (dissolved)	57-12-5	0.2
Fluoride(dissolved)	16984-48-8	1.6
Iron (dissolved)	7439-89-6	1.0
Lead (dissolved)	7439-92-1	0.05
Manganese (dissolved)	7439-96-5	0.2
Molybdenum (dissolved)	7439-98-7	1.0
Mercury (total)	92786-62-4	0.002
Nickel (dissolved)	7440-02-0	0.2
Perchlorate (total)	14797-73-0	0.0256

Organic Chemicals:	CAS#	mg/L
Benzene (total)	71-43-2	0.01
Benzo (a) pyrene (total)	50-32-8	0.0007
Carbon tetrachloride (total)	56-23-5	0.01
Chloroform (total)	67-66-3	0.1
1,1-Dichloroethane (total)	75-34-3	0.025
1,2-Dichloroethane (total)	107-06-2	0.01
1-1-Dichloroethylene (total)	75-35-4	0.005
1,1,2,2-Tetrachloroethylene (PCE) (total)	127-18-4	0.02
1,1,2-Trichloroethylene (TCE) (total)	86-42-0	0.1
Ethylbenzene (total)	100-41-4	0.75
Ethylene dibromide (total)	1106-93-4	0.0001
Naphthalene plus monomethylnaphthalenes (total)	91-20-3, 90-12-0, 91-57-6	0.03
Methylene chloride (total)	75-09-2	0.1
Total PCBs (total)		0.001
Phenols (total)	108-95-2	0.005
Toluene (total)	108-88-3	0.75
1,1,1-Trichloroethane(total)	74552-83-3	0.06
1,1,2-Trichloroethane (total)	79-00-5	0.01

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pH (total)		6 – 9
Selenium (dissolved)	7782-49-2	0.05
Silver (dissolved)	7440-22-4	0.05
Sulfate (dissolved)		600.0
Total Dissolved Solids (dissolved)		1000.0
Uranium (dissolved)	7440-61-1	0.03
Zinc (dissolved)	9029-97-4	10.0

1,1,2,2-Tetrachloroethane (total)	79-34-5	0.01
Vinyl Chloride (total)	75-01-4	0.001
Xylenes (total)~~(total)~~	108-38-3, 1330-20-7, 95-47-6, 106-42-3	0.62

Radioactivity:		**pCi/L**
Combined Radium-226 & Radium-228 (total)		30

Nitrogen Compounds:		**mg/L**
Total Nitrogen (sum of TKN+NO_3-N) (~~total~~dissolved)		15

b. Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for Total Nitrogen shall apply for discharges to Outfall 051:
- Daily Maximum: 45 mg/L
- Quarterly average: 15 mg/L

c. For any water contaminant that is not listed in Table 1 of this Discharge Permit but is listed as a toxic pollutant in 20.6.2.7.WW NMAC, the limit shall be the concentration listed in Table A-1 of NMED, Risk Assessment Guidance for Site Investigation and Remediation (most recent edition and provided as Appendix 1). For any water contaminant that is not listed in Table 1 of this Discharge Permit or in Table A-1 of the Risk Assessment Guidance, the limit shall be the most recent EPA Regional Screening Level (RSL) for residential tap water. If an RSL is applicable for a carcinogenic water contaminant, the limit shall be adjusted to represent a lifetime risk of no more than one cancer occurrence per 100,000 persons (i.e., a cancer risk of 1 x 10^{-5}).

In the event that effluent limits are exceeded, the Permittees shall enact the requirements of Condition 18 (Effluent Exceedance) of ~~contingency plan set forth in~~ this Discharge Permit. Water contaminants that are subject to effective and enforceable limitations in NPDES Permit No. NM0028355 for discharges to Outfall 051 are exempt from the limits set forth in this Condition.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

17. **EFFLUENT LIMITS: MES and SET**-The Permittees shall not discharge treated waste water to either the MES or SET that exceeds the following limits (or is outside the following pH range):

a) All water contaminants and their associated limits as listed in Table 2.

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Table 2. Effluent Quality Limits for Discharges to the MES and SET

Inorganic Chemicals:	CAS#	mg/L
Aluminum (dissolved)	7429-90-5	5.0
Arsenic (dissolved)	7440-38-2	0.1
Barium (dissolved)	7440-39-3	2.0
Boron (dissolved)	7440-42-8	0.75
Cadmium (dissolved)	7440-43-9	0.01
Chromium (dissolved)	7440-47-3	0.1
Chloride (dissolved)	7647-14-5	250.0
Cobalt (dissolved)	7440-48-4	0.05
Copper (dissolved)	7440-50-8	1.3
Cyanide (dissolved)	57-12-5	0.2
Fluoride(dissolved)	16984-48-8	1.6
Iron (dissolved)	7439-89-6	1.0

Inorganic Chemicals:	CAS#	mg/L
Lead (dissolved)	7439-92-1	0.05
Manganese (dissolved)	7439-96-5	0.2
Molybdenum (dissolved)	7439-98-7	1.0
Mercury (total)	92786-62-4	0.002
Nickel (dissolved)	7440-02-0	0.2
Perchlorate (total)	04797-73-0	0.0256
pH (total)		6 – 9
Selenium (dissolved)	7782-49-2	0.05
Silver (dissolved)	7440-22-4	0.1
Sulfate (dissolved)		600.0
Total Dissolved Solids (dissolved)		1000.0
Uranium (dissolved)	7440-61-1	0.03
Zinc (dissolved)	9029-97-4	10.0

Radioactivity:		pCi/L
Combined Radium-226 & Radium-228 (total)		30

Nitrogen Compounds:		mg/L
NO_3-N (dissolved)		10

d. Until LANL is operating new reverse osmosis treatment units, but no later than September 30, 2016, the following alternative effluent quality limits for N~~O~~O3-N shall apply for discharges to ~~Outfall 051~~the SET and MES:

- Daily Maximum: 30 mg/L
- Quarterly average: 10 mg/L

In the event that effluent limits are exceeded, the Permittee shall enact the requirements of Condition 18 (Effluent Exceedance) of ~~contingency plan set forth in~~ this Discharge Permit.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

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18. **EFFLUENT EXCEEDANCE**-In the event that analytical result of an effluent sample indicate an exceedance for any of the effluent limits set forth in paragraphs 16 and 17 of this Discharge Permit, the Permittees shall, within 24 hours following receipt of analytical results indicating the exceedance, collect and submit for analysis a subsequent sample for the particular analyte that was in exceedance. In the event the analytical results of the subsequent sample confirm that the maximum limitation has been exceeded (i.e., confirmed exceedance), the Permittees shall take the following actions:

Within 24 hours of becoming aware of a confirmed exceedance, the Permittees shall:

a. Cease discharges to the system for which limits have been exceeded with the exception of the MES to which a confirmed exceedance shall not require immediate cessation;

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b. Notify the NMED Ground Water Quality Bureau that an effluent limit set forth in this Discharge Permit has been confirmed to be in exceedance; and

c. Increase the frequency of effluent sampling to adequately establish the quality of discharges prior to resuming discharges to the system that was in exceedance. The sampling frequency for the particular analyte that was in exceedance shall increase from monthly or quarterly, as required by Condition 25 of this Discharge Permit, to weekly. If the particular analyte in exceedance remains below the effluent limit in three consecutive weekly samples, then the Permittees may resume discharges to the system that was in exceedance.

25 not applicable here

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Within one week of becoming aware of a confirmed exceedance, the Permittees shall:

a. Submit copies of the analytical results for the initial and subsequent sample confirming the exceedance to NMED;

a. Examine the internal operational procedures, and maintenance and repair logs, required by Condition 13 of this Discharge Permit, for evidence of improper operation or function of the units and systems; and

b. Conduct a physical inspection of the treatment system to detect abnormalities, and correct any abnormalities.

A report detailing the corrections made shall be submitted to NMED within 30 days following correction.

In the event that analytical results from any two independent monthly effluent samples indicate an exceedance of the effluent limits for all discharge systems set forth in this Discharge Permit within any 12-month period, the Permittees shall propose to modify operational procedures or upgrade the treatment process to achieve the effluent limits. Within 90 days of receipt of the second sample analysis in which effluent limits have been exceeded, the Permittees shall submit to NMED for approval a corrective action plan. The plan shall include a schedule for completion of corrective actions. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule.

When analytical results from three consecutive months of effluent sampling do not exceed the maximum limitations set forth by this Discharge Permit, the Permittees are authorized to return to a monthly or quarterly monitoring frequency as required in this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3107.C NMAC]

~~14.~~19. **PERSONNEL QUALIFICATIONS**-Personnel responsible for the operation and maintenance and repair of the Facility shall successfully complete a program of classroom instruction or on-the-job training that provides the skills required to ensure the Facility is operated and maintained in a manner that complies with this Discharge Permit and all applicable local, state and federal laws and regulations. At a minimum, the operators shall be competent in the following:

a. Management procedures for hazardous waste materials;
b. Conducting inspections;
c. Communications or alarm systems;
d. Emergency response due to unauthorized releases, fire, explosions, or other potential unauthorized releases from the Facility and threat to human health; and
e. Emergency shutdown operations.

The operations and maintenance and repair of all or any part of the Facility shall be performed by, or under the direct supervision of, qualified personnel. Facility personnel shall review training and certifications on an annual basis to ensure training and certifications are current with any changes to the Facility's processes.

The Permittees shall maintain the following documents and records at the Facility for current personnel until closure of the Facility:

a. The job title for each position at the Facility with a narrative of the position responsibilities, reporting hierarchy, requisite skill, education and other qualifications assigned to the position.
b. The name of the individual who holds each position and all records documenting training and job experience demonstrating the qualifications of that individual to hold the position.

The Permittees shall maintain all documents and records pertaining to the training of operation and maintenance personnel, including former employees, for a period of five years and shall make such documents and records available to NMED upon request.

[20.6.2.3106.C NMAC, 20.7.4 NMAC]

20. **EMERGENCY ~~PLAN~~ RESPONSE PROCEDURES** The Permittees shall keep and maintain ~~an~~ emergency response ~~plan~~procedures -at the Facility at all times. At a minimum, the ~~plan~~ procedures shall include the following:

a. Actions Facility personnel must take in response to fires, explosions or any unplanned sudden or non-sudden release of a water contaminant from the Facility to the environment.
b. A spill prevention and response plan to address all unauthorized releases to the environment or those that pose a threat to human health, chronic or acute.
c. ~~Communications and collaboration with local, state and federal emergency~~

~~response personnel~~Use of the Incident Command System (ICS) in response to all emergencies. The ICS is based on the on-scene management structure protocols of the National Incident Management System (NIMS).

d. ~~Names, addresses and phone numbers for all persons qualified to act as an emergency coordinator~~Activation of Los Alamos National Laboratory's Emergency Operations Center (EOC) for incidents requiring Laboratory and/or community involvement. The EOC provides a central location for interagency and interjurasdictional coordination and executive decision making in support of an incident response.

~~e. A list of all emergency equipment at the Facility that may be utilized in the event of an emergency, its intended function and physical location.~~

~~f.~~e. An evacuation ~~plan~~ procedure for all Facility personnel which describes signals to be used to notify personnel of an evacuation, routes to evacuated the Facility and alternate evacuation routes.

The emergency response procedures ~~plan~~ shall be reviewed, and updated as necessary, by the Permittees on no less than a ~~an annual~~ triennial -basis or in the event the plan fails during an emergency, the Facility changes design, construction, or accessibility, key personnel changes or the list of equipment changes. The emergency response procedures shall be made available for inspection at the facility~~ and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~
The Permittees shall submit a written summary of the procedures ~~plan~~ and any amendments to NMED no more than 30 days following finalization of the amended plan.

~~The Permittees' written summary shall be provided to the Los Alamos County Emergency Management Coordinator, Los Alamos Fire Department, Los Alamos County Police, Los Alamos Medical Center, New Mexico's Department of Homeland Security and Emergency Management (DHSEM), Pueblo of San Ildefonso, Pueblo of Santa Clara, Pueblo of Jemez and Pueblo of Cochiti, and shall be posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~ ✓✓

[20.6.2.3109.C NMAC]

~~15.~~21. **INSTALLATION OF FLOW METERS-**Within 180 days following the effective date of this Discharge Permit, (by DATE), the Permittees shall install the following flow meters:

a. One flow meter to be installed on the RLW influent line to the Facility at a location that will capture and measure all influent to the Facility including waste water conveyed to the Facility by alternative methods (e.g. truck).

b. One flow meter to be installed on the effluent line to the SET at a location that will capture and measure all discharges of treated water to the SET.

c. One flow meter to be installed on the effluent line to the MES at a location that will capture and measure all discharges of treated water to the MES.

d. One flow meter to be installed on the discharge line to Outfall 051 at a location that will capture and measure all effluent discharges to Outfall 051.

Within 60 days following the installation of flow meters, and within 240 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED ~~and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~ written confirmation of the meter installation, describing the type, calibration, and location of each flow meter. The flow meters shall be operational except during repair or replacement. Should a meter fail, it shall be repaired or replaced as soon as practical, but no later than 30 days from the date of the failure. During repair or replacement, an alternative method for determining the volume of RLW influent and effluent shall be used until the meter is repaired or replaced.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~16.~~22. **CALIBRATION OF FLOW METERS**-All flow meters referenced in this Discharge permit shall be capable of having their accuracy ascertained under actual working (field) conditions. A field calibration method shall be developed for each flow meter and that method shall be used to check the accuracy of each respective meter. Field calibrations shall be performed within 180 days following the effective date of this Discharge Permit (by DATE) and, at a minimum, on an annual basis thereafter, and immediately upon repair or replacement of a flow meter.

Flow meters shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field conditions. Field calibrations shall be performed by an individual knowledgeable in flow measurement and in the installation and operation of the particular device in use. A calibration report shall be prepared for each flow meter at the frequency calibration is required.

The flow meter calibration report shall include the following information:

a. The meter location and identification;
b. The method of flow meter field calibration employed;
c. The measured accuracy of each flow meter prior to adjustment indicating the positive or negative offset as a percentage of actual flow as determined by an in-field calibration check;
d. The measured accuracy of each flow meter following adjustment, if necessary, indicating the positive or negative offset as a percentage of actual flow of the meter; and
e. Any flow meter repairs made during the previous year or during field calibration.

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The Permittees shall maintain records of flow meter calibration at a location accessible for review by NMED during Facility inspections.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

B. Monitoring and Reporting

~~17.~~23. **METHODOLOGIES**-Unless otherwise approved in writing by NMED, the Permittees shall conduct sampling and analysis in accordance with the most recent edition of the following documents:

a. American Public Health Association, Standard Methods for the Examination of Water and Waste water;
b. U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste;
c. U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey;
d. American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water;
e. U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition;
f. Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations; or
g. Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy;

[20.6.2.3107.A NMAC, 20.6.2.3107.B NMAC]

~~18.~~24. **MONITORING REPORTS**-The Permittees shall submit monitoring reports to NMED on a quarterly basis~~ and shall post all reports on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~. Quarterly sampling and analysis as required in this Discharge Permit shall be performed within the following periods and reports shall be submitted as described below:

a. Sampling and analysis completed between January 1 and March 31– report to be submitted to NMED by May 1;
b. Sampling and analysis completed between April 1 and June 30 – report to be submitted to NMED by August 1;
c. Sampling and analysis completed between July 1 and September 30– report to be submitted to NMED by November 1;
d. Sampling and analysis completed between October 1 and December 31– report to be submitted to NMED by February 1.

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC, 20.6.2.3109.C NMAC, 20.6.2.3107.A NMAC]

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~~19.~~25. **INFLUENT VOLUMES RLW**-The Permittees shall measure the volume of all RLW influent waste water being conveyed to the Facility on a daily basis using the flow meter required to be installed pursuant to ~~by~~ this Discharge Permit.

The total daily and monthly volumes of RLW influent conveyed to the Facility shall be submitted to NMED in the quarterly monitoring reports ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

~~20.~~26. **INFLUENT VOLUMES TRU**-The Permittees shall estimate the volume of TRU influent waste water being conveyed to the Facility using electronic sensors which measure tank levels in both the acid waste and caustic waste influent tanks.

The electronic sensors on these tanks shall be operational except during repair or replacement. Should a sensor used to calculate TRU influent volumes fail, it shall be repaired or replaced as soon as practical, but no later than 30 days from the date of the failure. During repair or replacement, an alternative method for determining the flow of TRU influent shall be used until the defective sensor is repaired or replaced.

Volumes shall be determined by calculation using the head change and tank size. Operators shall record changes in influent tank levels whenever a batch of TRU waste water is conveyed to the Facility. The total daily and monthly volumes of TRU influent received by the Facility shall be submitted to NMED in the quarterly monitoring reports ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC].

~~21.~~27. **DISCHARGE VOLUMES**-The Permittees shall measure and record the volume of treated waste water discharged to the SET, MES and Outfall 051 on a daily basis. The Permittees shall determine effluent volumes as follows:

a. Discharge volumes to the SET shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the unit.

b. Discharge volumes to Outfall 051 shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the outfall.

c. Discharge volumes to the MES shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the unit.

The daily and monthly discharge volumes shall be submitted to NMED in the quarterly monitoring reports~~ and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

~~22.~~28. **WASTE TRACKING**-The Permittees shall maintain written or electronic records of ~~all the following~~ all -waste streams conveyed to ~~or from~~ the Facility~~: Radioactive Liquid Waste Bottoms, low level sludge, TRU sludge and low-level solid waste (PPE, sample bottles, filters, membranes, etc).~~. At a minimum, the Permittees shall record the following information:

a. The name of the generator and a unique waste stream identification number.
b. The time period that the Permittee approves the generator to convey the waste stream to the Facility.
c. The location where the waste stream was generated.
d. Estimated volume and duration of the waste stream, including:
   - Estimated number of days per year discharge will occur;
   - Average daily volume received by the Facility when discharge occurs;
   - Maximum daily volume received by the Facility each year when discharge occurs; and
   - Estimated total volume discharged to the facility each year.
e. The waste stream characterization (i.e., analytical data or knowledge of process).
f. The names of the personnel that approved the receipt of the waste at the Facility (e.g., Waste Certifying official, RCRA Reviewer, and Facility Reviewer).

Permittees shall maintain written or electronic records of the following waste streams conveyed from the Facility: Radioactive Liquid Waste Bottoms, low-level sludge, TRU sludge, and low-level solid waste (PPE, sample bottles, filters, membranes, etc). The Permittees shall allow NMED or an authorized representative to have access to and copy, at reasonable times, records that must be kept under this condition. Scott

The Permittees shall maintain all waste tracking records required by this Condition for five years from the date of the final discharge from the generator of that waste stream. The Permittees shall furnish upon request, and make available at all reasonable times for inspection, the waste tracking records required in this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~23.~~29. **EFFLUENT SAMPLING** -The Permittees shall sample and analyze effluent waste streams discharged to Outfall 051, the SET, and the MES.

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Treated effluent samples shall be collected once per calendar month for any month in which a discharge occurs to Outfall 051. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for all water contaminants listed in 20.6.2.3103 NMAC, TKN and all toxic pollutants as defined in 20.6.2.7.WW NMAC.

Treated effluent samples shall be collected once per calendar month for any month in which a discharge occurs to the MES or SET. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for TKN, NO_3-N, TDS, Cl, F and perchlorate.

The Permittees shall collect and analyze effluent samples once per quarter for any quarterly period in which a discharge occurs to the MES or SET. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants as defined in 20.6.2.7.WW NMAC.

All samples shall be properly prepared, preserved, transported and analyzed in accordance with the parameters and methods authorized in this Discharge Permit and will be submitted to an independent environmental laboratory accredited under the National Environmental Laboratory Accreditation Program. Analytical results shall be submitted to NMED in the quarterly monitoring reports ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~. For any calendar month during which no discharge occurs, the Permittees shall submit to NMED a report so stating.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

Moved Para #26

~~24.~~30. **SOIL MOISTURE MONITORING SYTEM FOR THE SET**-Within 120 days following the effective date of this Discharge Permit (by DATE), the Permittees shall submit to NMED for approval a proposed workplan, design and schedule for the installation of a moisture monitoring system for the detection of unauthorized releases from the SET. The system shall be designed to detect, at a minimum, absolute variations in volumetric soil moisture content below the SET within a precision of 2%. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

The Permittees shall install the moisture monitoring boreholes in accordance with the final workplan, design and schedule approved by NMED.

The Permittees shall use neutron moisture probes to log the moisture monitoring boreholes following installation to establish baseline conditions and to develop a calibration data set for the probe and a soil moisture action

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level, to be approved by NMED, which indicates that moisture is being detected below the SET at levels that are above baseline conditions.

Within 90 days following acceptance of the final construction of the moisture monitoring boreholes by the Permittees, the Permittees shall submit to NMED for approval the following items:

a. Confirmation that the moisture monitoring borehole installation has been completed.
b. Record drawings of the final design of the completed installation.
c. Reports on the baseline moisture condition and neutron probe calibration.
d. A proposed action level to be used to indicate that elevated moisture has been detected beneath the SET.

Upon approval or approval with conditions by NMED~~,~~ of the completed installation and soil moisture action level, the Permittees shall perform quarterly soil moisture monitoring in the moisture monitoring boreholes. ~~The Permittees' submittals along with any NMED response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~In the event that the soil moisture content beneath the SET exceeds the NMED approved action level, the Permittees shall enact the contingency plan set forth in this Discharge Permit.~~

The moisture monitoring boreholes and neutron probes shall be maintained so that the boreholes remain accessible for monitoring and the probe remains operational. Should the system or a component of the system fail, it shall be repaired or replaced as soon as possible, but no later than 90 days from the date of the failure. For good cause, NMED may approve a longer period.

The Permittees shall maintain all documents and records pertaining to the quarterly monitoring events and maintenance or repair of the soil moisture monitoring system for a period of five years and shall make such documents and records available to NMED upon request.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

Former #26

31. **SOIL MOISTURE DETECTION SYSTEM EXCEEDANCE-** In the event that the soil moisture detection system for the SET detects a soil moisture increase beneath the SET that exceeds the NMED approved action level, the Permittees shall take the following corrective actions:

a. Notify the NMED Ground Water Quality Bureau within 15 days following the date when the soil moisture was initially discovered to exceed the action level.
b. Within 60 days following the date when the soil moisture was initially re-vised scott

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discovered to exceed the action level, identify the source of the increased soil moisture beneath the SET to NMED and the basis for the identification of the source.

Scott

In the event the source of the soil moisture exceedance is demonstrated to be associated with a leak from or breach of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 30 days following the date when the Permittees identify the source of the increased soil moisture beneath the SET to NMED. At a minimum, the corrective action plan shall include the following: re-word

a. Removal of all standing liquid from one or both basins (as appropriate);
b. A proposal for repairing or replacing the synthetic liners within the SET, if leakage through the synthetic liners is found to be the source, or for other repairs;
c. A plan for re-instituting soil moisture monitoring following repairs to the SET to demonstrate that the repairs resolved the source of the increased soil moisture beneath the SET; and
d. A schedule for implementation of the corrective action plan elements.

In the event the source of the soil moisture exceedance is demonstrated to be associated with an occurrence other than a failure of the SET, the Permittees shall submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level. The corrective action plan shall include any actions necessary to ensure the soil moisture detection system is operating within its intended function as required by this Discharge Permit including, but not limited to, re-calibration.

Upon NMED approval, or approval with conditions, the Permittees shall implement the corrective action plan according to the approved schedule.

[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

~~25.~~32. **GROUND WATER FLOW**-The Permittees shall submit a ground water flow direction report to NMED on an annual basis. The report shall contain regional, intermediate and alluvial aquifer ground water depth-to-water measurements, existing interconnections with other aquifers (if any are known), a narrative description of the known characteristics of the ground water elevation and flow direction within each aquifer and, to the extent practicable, ground water elevation contour map(s) for the aquifers underlying Sandia, Pajarito, Ten-Site and Mortandad Canyons.

The ground water elevation contour maps shall depict the ground water flow direction based on the most recent representative ground water elevation data from monitoring wells located in the subject areas. Ground water elevations shall be estimated using common interpolation methods to a contour interval approved by NMED and appropriate to the available data. Ground water elevation contour maps shall depict the water table and potentiometric surfaces, ground water flow directions, and the location and name of each monitoring well and discharge location unit associated with this Discharge Permit.

The ground water flow direction report shall be submitted to NMED in the monitoring report due on February 1 of each year ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C]

Alluvial (ccw)

33. **REPLACEMENT OF TWO EXISTING GROUND WATER MONITORING WELLS ~~REPLACEMENT~~** – Within 90 days of the effective date of this Discharge Permit (by DATE), the permittees shall submit to NMED a workplan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051. The well installation work plan will include proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement wells in accordance with the Groundwater Quality Bureau, Monitoring Well Construction and Abandonment Guidelines, Revision 1.1, March 2011 or other approved specification by NMED and the approved work plan and schedule.

34. **MONITORING WELL LOCATION**-In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well is not located hydrologically downgradient of the discharge location it is intended to monitor, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods and well specifications, and proposing a schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule. (# 37)

Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days following well completion, the Permittees shall submit to NMED a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map.

Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011 or other specification approved by NMED.

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[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC]

35. **MONITORING WELL CONSTRUCTION**-In the event that information available to NMED indicates that a well is not constructed in a manner consistent with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Guidelines, Revision 1.1,* March 2011; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule.

or other specification...

Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days of well completion, the Permittees shall submit to NMED construction and lithologic logs, survey data, and a ground water elevation contour map.

Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1,* March 2011. or other...

Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, and abandonment and documentation of the abandonment procedures shall be completed in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1,* March 2011, and all applicable local, state, and federal laws and regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]

~~26.~~36. **GROUND WATER MONITORING** - The Permittees shall collect ground water samples from the following ground water monitoring wells on a quarterly basis and analyze the samples for TKN, NO_3-N, TDS, Cl, F and perchlorate.

a. **Replacement Alluvial Well** ~~**MCO-3** previously constructed and located in the a~~Alluvial aquifer replacement well installed as a condition of this Discharge Permit ~~presumed to be~~ located hydrologically downgradient of Outfall 051.

b. **Replacement Alluvial Well** ~~**MCO-7** previously constructed and located~~

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~~in the a~~Alluvial aquifer replacement well installed as a condition of this Discharge Permit ~~presumed to be~~ located hydrologically downgradient of Outfall 051.

c. **MCOI-6**-previously constructed and located in the intermediate aquifer ~~presumed to be~~ hydrologically downgradient of Outfall 051.

The Permittees shall collect ground water samples from the following ground water monitoring wells on an annual basis and analyze the samples for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants listed in 20.6.2.7.WW.

a. **Replacement Alluvial Well** – Installed as a condition of this Discharge Permit and hydrologically downgradient of Outfall 051.

~~a. **MCO-3- previously constructed and located in the alluvial aquifer presumed to be hydrologically downgradient of Outfall 051.**~~

b. **Replacement Alluvial Well~~MCO-7~~** - ~~previously constructed and located in the alluvial aquifer presumed to be~~ Installed as a condition of this Discharge Permit and hydrologically downgradient of Outfall 051~~hydrologically downgradient of Outfall 051.~~

c. **MCOI-6** - previously constructed and located in the intermediate aquifer presumed to be hydrologically downgradient of Outfall 051.

d. **R-46** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

e. **R-60** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

f. **R-1** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

g. **R-14** - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

Sampling shall be done in accordance with the methods authorized in this Discharge Permit and using the following procedure:

a. Measure the ground-water surface elevation, to the nearest hundredth (0.01) of a foot, from the top of the casing, each time ground water is sampled.
b. Calculate total volume of water within the monitoring well using the most recent total depth measurement.
c. For intermediate and regional aquifer wells, purge three well volumes of water from the monitoring well prior to sampling, using an adequate pumping system. For alluvial wells, purge well for a minimum of one well volume.
d. Collect samples from the well using appropriate methods to avoid cross-contamination of the samples and sources.
e. Prepare the Chain-of-Custody, preserve the sample and transport samples in accordance with methods authorized in this Discharge Permit.
f. Samples shall be analyzed by an independent analytical laboratory

accredited under the National Environmental Laboratory Accreditation Program (NELAP) using EPA approved test methods.

The Permittees may submit to NMED for approval Standard Operating Procedures developed for the Interim Facility-Wide Groundwater Monitoring Plan that would apply in lieu of the sampling protocols described in this Permit Condition. Upon NMED approval or partial approval of such alternate plan, the approved plan or portion thereof shall apply and be fully enforceable in lieu of this Permit Condition. ~~The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

? did this get moved?

The Permittees shall use sampling and analytical methods that ensure the production of accurate and reliable data indicative of ground water quality in all ground water that may be affected by any discharges from the Facility. The Permittees shall prepare ground water monitoring reports describing, in detail, the sampling and analytical methods used. The ground water monitoring reports shall contain, at minimum, the following information:

a. Date sample was collected;
b. Time sample was collected;
c. Individuals collecting sample;
d. Monitoring well identification;
e. Physical description of monitoring well location;
f. Ground-water surface elevation;
g. Total depth of the well;
h. Total volume of water in the monitoring well prior to sample collection;
i. Total volume of water purged prior to sample collection;
j. Physical parameters including temperature, conductivity, pH, oxidation-reduction potential;
k. Description of sample methods (i.e., constituent being sampled for, container used, preservation methods);
l. Chain-of custody; and
m. Map, to scale, identifying monitoring wells and their location.

The ground water monitoring report shall be submitted to NMED with the quarterly monitoring report required in this Discharge Permit ~~and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated)~~.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

37. **GROUND WATER EXCEEDANCE-** NMED reviews ground water data that is generated by the Permittees from samples collected from the monitoring wells identified in this Discharge Permit and other monitoring wells in the vicinity of the Facility. The Permittees report newly detected ground water quality standard exceedances ~~or the~~ newly detected toxic

In the event that analytical result of an effluent

pollutants (as defined in this Discharge Permit and in 20.6.2.7.WW NMAC) in ground water for the entire Laboratory to NMED. If NMED determines that a ground water quality standard is exceeded or that a toxic pollutant is present in ground water, potentially due to a discharge associated with the Facility or defined systems in this Discharge Permit, the Permittees shall submit a ground water investigation/source control workplan to NMED for approval within 60 days following notification to do so by NMED.

At a minimum, the ground water investigation/source control workplan shall include the following elements:

a. A proposal to investigate the source, nature and extent of the ground water contamination, if unknown, which may utilize existing ground water monitoring wells or may propose the installation of new monitoring wells, as appropriate;
b. A proposal to mitigate the discharge or mobilization of the water contaminant which might be causing ground water contamination, as appropriate; and
c. A schedule for implementation of the workplan and submittal of a report to NMED.

this is all Bill W. its OK - same language

Upon NMED approval of the ground water investigation/source control workplan, or approval of the plan with conditions, the Permittees shall implement the workplan and submit a written report to NMED in accordance with the approved schedule.

Should the findings of the ground water investigation reveal that a discharge associated with the Facility or defined systems in this Discharge Permit is a source of the ground water contamination, the Permittees shall abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC, following notification from NMED.

This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the March 1, 2005 Compliance Order on Consent (Consent Order) agreed to by NMED, DOE, and the Regents of the University of California (predecessor to LANS).

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.E NMAC, 20.6.2.3107.A NMAC]

C. Contingency Plans

~~27. **CONTAINMENT**-The Permittees shall institute corrective actions, as necessary, to ensure the protection of ground water and human health. In the event that a unit or system or secondary containment for a unit or system reveals damage that could result in structural failure or a release to the~~

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~~environment, the Permittees shall take the following actions:~~

~~a. The Permittees shall remove the unit or system from service immediately.~~

~~b. The Permittees shall take immediate, and if necessary temporary, corrective actions to minimize the potential for a release.~~

~~c. If failure of the unit or system or secondary containment resulted in a release to the environment, the Permittees shall provide NMED oral notification of the release in accordance with 20.6.2.1203 NMAC within 24 hours of learning of the release and take subsequent corrective actions as required in this Discharge Permit.~~

~~d. Within 90 days following identification of the potential failure or release, the Permittees shall submit to NMED for approval a written corrective action report to include, at minimum, the following:~~

~~1) Identification of the unit or system, or secondary containment for a unit or system in which the failure was observed.~~

~~2) The date and time the failure was observed and the date and time it was estimated to have begun.~~

~~3) The potential cause of the failure.~~

~~4) For units in which a release occurred to secondary containment but was not released to the environment, the rate at which the release occurred and total volume released to the secondary containment.~~

~~5) The characteristics of the waste stream being treated, stored or conveyed by the unit or system, with analytical results from waste stream samples taken with date, time, technical staff collecting the sample and the lab report with QA/QC.~~

~~6) The corrective actions taken to remediate the failure or release with a timeline of when actions were implemented.~~

~~7) Long term actions, if any, that are proposed to be employed for maintaining the integrity of the secondary containment and the schedule for implementing such actions.~~

~~8) Ongoing measures for monitoring, inspecting, and determining structural integrity of the secondary containment.~~

~~9) Proposed operation and maintenance and repair protocol, if applicable, to be instituted to prevent future failures.~~

~~Upon NMED approval of the corrective action report, the Permittees shall implement any approved long-term actions to maintain the integrity of the secondary containment, and any other approved measures or protocols, according to the approved schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[20.6.2.3107.A NMAC]~~

~~28. **WATER-TIGHTNESS** In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit~~_~~, or~~

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~~should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions:~~

~~a. If the unit or system failure resulted in an unauthorized release, either through a primary or secondary containment unit or system, the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions:.~~

~~b. If the failed unit or system does not have secondary containment the Permittees shall take the following corrective actions:~~

~~1) The Permittees shall remove the unit or system from service immediately; and~~

~~2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.~~

~~c. If the failed primary unit or system has secondary containment, the Permittees shall submit to NMED for approval a written proposal for corrective actions, within 90 days following the failure of the unit or system. The corrective action proposal shall include a schedule for corrective actions to be taken to repair or to permanently cease operation of the unit or system.~~

~~If repair or replacement of a unit or system requires construction, the Permittees shall submit plans and specifications to NMED with the proposed corrective actions. The Permittees' proposal shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated). Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).~~

~~Upon NMED approval, the Permittees shall implement the approved corrective actions according to the approved schedule. The Permittees shall post NMED's response on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~Prior to placing a repaired or replaced unit or system back into service, the Permittee shall repeat the water-tightness testing in accordance with Condition 8 to verify the effectiveness of the repair or replacement, and submit a report detailing the completion of the corrective actions to NMED. The report shall include the date of the test, the name of the individual that performed the test, written findings, photographic documentation of the unit's interior and water tightness test results. If notified to do so by NMED, the Permittees shall also submit record drawings that include the final, construction details of the unit. Record drawings shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978). The Permittees'~~

~~submittal shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]~~

~~29. **SETTLED SOLIDS REMOVAL** In the event the average settled solids (as defined in Condition 9 of this Discharge Permit) accumulation in an open unit or system exceeds a depth of one foot, or in the event that the Permittees otherwise plan to initiate removal of settled solids from an open unit or system, the Permittees shall propose a plan for the removal and disposal of the settled solids from the unit or system. At least 120 days prior to any settled solids removal, the Permittees shall submit to NMED for approval a written settled solids removal and disposal plan. The plan shall include characterization of the settled solids, the estimated volume of settled solids to be removed, a method for removal throughout the unit or system in a manner that is protective of the structural integrity of the unit or system, a schedule for completing the settled solids removal and disposal, and a description of how the settled solids will be contained, transported, and disposed of in accordance with all local, state, and federal laws and regulations. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC,]~~

~~30. **DAMAGE TO STRUCTURAL INTEGRITY** In the event that an inspection required in this Discharge Permit, or any other observation, reveals significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall notify NMED orally within 24 hours, and shall propose the repair or replacement of the treatment system or its associated components. Within 90 days after discovery by the Permittees or following notification from NMED that corrective action is required, the Permittees shall submit to NMED for approval a written corrective action plan that includes a schedule for implementation and completion. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees shall remedy any deterioration or malfunction of equipment or structures which are discovered during inspection. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[20.6.2.3107.A NMAC]~~

~~31. **FREEBOARD EXCEEDANCE** In the event that freeboard, two feet or an~~

~~NMED approved alternative, is not maintained in an open tank, impoundment or other open unit or system that contains a liquid or semi-liquid, the Permittees shall take immediate corrective actions to restore the required freeboard.~~

~~32.~~

~~33. In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the Permittees shall submit to NMED for approval a proposed corrective action plan to restore the required freeboard within 15 days following the date when exceedance of the required freeboard was initially discovered. The plan shall include a schedule for completion of corrective actions and quantifiable assessments to demonstrate preservation of the required freeboard for a period no less than five years. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]~~

~~34. **EFFLUENT EXCEEDANCE** In the event that analytical result of an effluent sample indicate an exceedance for any of the effluent limits set forth by this Discharge Permit, the Permittees shall collect and submit for analysis a subsequent sample for the particular analyte that was in exceedance within 24 hours following receipt of analytical results indicating the exceedance. In the event the analytical results of the subsequent sample confirm that the maximum limitation has been exceeded (i.e., confirmed exceedance), the Permittees shall take the following actions:~~

~~Within 24 hours of becoming aware of a confirmed exceedance, the Permittees shall:~~

~~a. Cease discharges to the system that limits have been exceeded with the exception of the MES to which a confirmed exceedance shall not require immediate cessation;~~

~~Notify the NMED Ground Water Quality Bureau that an effluent limit set forth in this Discharge Permit has been confirmed to be in exceedance; and~~

~~Increase the frequency of effluent sampling to adequately establish the quality of discharges prior to resuming discharges to the system that was in exceedance.~~

~~Within one week of becoming aware of a confirmed exceedance, the Permittees shall:~~

~~a. Submit copies of the analytical results for the initial and subsequent sample confirming the exceedance to NMED;~~

~~a. Examine the internal operational procedures, and maintenance and repair logs, required by Condition 11 of this Discharge Permit, for evidence of~~

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~~improper operation or function of the units and systems; and~~
~~Conduct a physical inspection of the treatment system to detect abnormalities, and correct any abnormalities.~~

~~A report detailing the corrections made shall be submitted to NMED within 30 days following correction. The Permittees' report shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~In the event that analytical results from any two independent monthly effluent samples indicate an exceedance of the effluent limits for all discharge systems set forth in this Discharge Permit within any 12-month period, the Permittees shall propose to modify operational procedures or upgrade the treatment process to achieve the effluent limits. Within 90 days of receipt of the second sample analysis in which effluent limits have been exceeded, the Permittees shall submit to NMED for approval a corrective action plan. The plan shall include a schedule for completion of corrective actions. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule. The Permittees' corrective action plan along with NMED's response shall be posted by the Permittees on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~When analytical results from three consecutive months of effluent sampling do not exceed the maximum limitations set forth by this Discharge Permit, the Permittees are authorized to return to a monthly or quarterly monitoring frequency as required in this Discharge Permit.~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3107.C NMAC]~~

~~**SOIL MOISTURE DETECTION SYSTEM EXCEEDANCE**- In the event that the soil moisture detection system for the SET detects a soil moisture increase beneath the SET that exceeds the NMED approved action level, the Permittees shall take the following corrective actions:~~

~~a. Notify the NMED Ground Water Quality Bureau within 15 days following the date when the soil moisture was initially discovered to exceed the action level.~~
~~b. Propose the source of the increased soil moisture beneath the SET to NMED within 60 days following the date when the soil moisture was initially discovered to exceed the action level. Include the basis for the determination.~~

~~In the event the source of the soil moisture exceedance is demonstrated to be~~

~~associated with failure of the SET, the Permittees shall cease discharges to the SET and submit a corrective action plan to NMED, for approval, within 120 30 days following the date when the soil moisture was initially discovered to exceed the action level. At a minimum, the corrective action plan shall include the following:~~

~~a. Removal of all standing liquid from one or both basins (as appropriate);~~
~~b. A proposal for repairing or replacing the synthetic liners within the SET, if leakage through the synthetic liners is found to be the source, or for other repairs;~~
~~c. A plan for re-instituting soil moisture monitoring following repairs to the SET to demonstrate that the repairs resolved the source of the increased soil moisture beneath the SET; and~~
~~d. A schedule for implementation of the corrective action plan elements.~~

~~In the event the source of the soil moisture exceedance is demonstrated to be associated with an occurrence other than a failure of the SET, the Permittees shall submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level. The corrective action plan shall include any actions necessary to ensure the soil moisture detection system is operating within its intended function as required by this Discharge Permit including, but not limited to, re-calibration.~~

~~Upon NMED approval, or approval with conditions, the Permittees shall implement the corrective action plan according to the approved schedule. The Permittees' corrective action plan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]~~

~~35. **MONITORING WELL LOCATION** In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well is not located hydrologically downgradient of the discharge location it is intended to monitor, NMED may require the Permittees to install a replacement well or wells. Within 930 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods and well specifications, and proposing a schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~Within 90 days following well completion, the Permittees shall survey the~~

~~elevation and location of the newly installed replacement monitoring well or wells. Within 120 days following well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map.~~

~~Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC]~~

36. ~~**MONITORING WELL CONSTRUCTION** In the event that information available to NMED indicates that a well is not constructed in a manner consistent with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Guidelines, Revision 1.1*, March 2011; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule. The Permittees' proposal along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

~~Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days of well completion, the Permittees shall submit to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) construction and lithologic logs, survey data, and a ground water elevation contour map.~~

~~Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.~~

~~Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, and abandonment and documentation of the abandonment procedures shall be completed in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011, and all applicable local, state, and federal laws and~~

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~~regulations. The well abandonment documentation shall be submitted to NMED and posted on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) within 60 days of completion of well plugging activities.~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]~~

~~37. **GROUND WATER EXCEEDANCE** NMED reviews ground water data that is generated by the Permittees from samples collected from the monitoring wells identified in this Discharge Permit and other monitoring wells in the vicinity of the Facility. The Permittees report newly detected ground water quality standard exceedances, or the newly detected toxic pollutants (as defined in this Discharge Permit and in 20.6.2.7.WW NMAC) in ground water for the entire Laboratory to NMED. If NMED determines that a ground water quality standard is exceeded or that a toxic pollutant is present in ground water, potentially due to a discharge associated with the Facility or defined systems in this Discharge Permit, the Permittees shall submit a ground water investigation/source control workplan to NMED for approval within 60 days following notification to do so by NMED. The Permittees' workplan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~
~~At a minimum, the ground water investigation/source control workplan shall include the following elements:~~

~~a. A proposal to investigate the source, nature and extent of the ground water contamination, if unknown, which may utilize existing ground water monitoring wells or may propose the installation of new monitoring wells, as appropriate;~~
~~b. A proposal to mitigate the discharge or mobilization of the water contaminant which might be causing ground water contamination, as appropriate; and~~
~~c. A schedule for implementation of the workplan and submittal of a report to NMED.~~

~~Upon NMED approval of the ground water investigation/source control workplan, or approval of the plan with conditions, the Permittees shall implement the workplan and submit a written report to NMED and post on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated) in accordance with the approved schedule.~~

~~Should the findings of the ground water investigation reveal that a discharge associated with the Facility or defined systems in this Discharge Permit is a source of the ground water contamination, the Permittees shall abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC, following notification from NMED.~~

~~This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the March 1, 2005 Compliance Order on Consent (Consent Order) agreed to by NMED, DOE, and the Regents of the University of California (predecessor to LANS).~~

~~[NMSA 1978, § 74-6-5.D, 20.6.2.3109.E NMAC, 20.6.2.3107.A NMAC]~~

38. **SPILL OR UNAUTHORIZED RELEASE**-In the event of ~~that~~ a release not authorized in this Discharge Permit ~~occurs~~(other than an Actual or Threatened Water-Tightness Failure covered by Condition 9 of this Discharge Permit, an Effluent Exceedance covered by Condition 18 of this Discharge Permit or a Soil Moisture Monitoring Exceedance covered by Condition 31 of this Discharge Permit), the Permittees shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in 20.6.2.1203 NMAC and summarized below.

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Within 24 hours following discovery of the unauthorized discharge, the Permittees shall orally notify NMED and provide the following information:

a. The name, address, and telephone number of the person or persons in charge of the Facility;
b. The identity and location of the Facility;
c. The date, time, location, and duration of the unauthorized discharge;
d. The source and cause of unauthorized discharge;
e. A description of the unauthorized discharge, including its estimated chemical composition;
f. The estimated volume of the unauthorized discharge; and
g. Any actions taken to mitigate immediate damage from the unauthorized discharge.

Within one week following discovery of the unauthorized discharge, the Permittees shall submit written notification to NMED with the information listed above and any pertinent updates.

Within 15 days following discovery of the unauthorized discharge, the Permittees shall submit to NMED for approval a corrective action report and plan describing any corrective actions taken and to be taken to address the unauthorized discharge that includes the following:

a. A description of proposed actions to mitigate damage from the unauthorized discharge;
b. A description of proposed actions to prevent future unauthorized discharges of this nature; and
c. A schedule for completion of proposed actions.

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Upon NMED approval of the corrective action report and plan, the Permittees shall implement the approved actions according to the approved schedule. ~~The Permittees' corrective action report and plan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to 20.6.2.1203.A(1) NMAC, the Permittees may be required to abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC.

Nothing in this condition shall be construed as relieving the Permittees of the obligation to comply with all requirements of 20.6.2.1203 NMAC.

[NMSA 1978, § 74-6-5.D, 20.6.2.1203 NMAC, 20.6.2.3109.B NMAC]

39. **FAILURES IN DISCHARGE PLAN/DISCHARGE PERMIT**-In the event that NMED or the Permittees identify any failure of the discharge plan or this Discharge Permit not specifically set forth herein, NMED may require the Permittees to submit for its approval a corrective action plan and a schedule for completion of corrective actions to address the failure. Additionally, NMED may require a Discharge Permit modification to achieve compliance with Part 20.6.2 NMAC. ~~The Permittees' corrective action plan along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

    [20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

D. Closure

40. **CESSATION OF OPERATION OF SPECIFIC UNITS-** Within 60 days of the effective date of this Discharge Permit (by DATE), the Permittees shall permanently cease operation of the following units:
    a. The 75,000 gallon concrete influent storage tank (75K tank) will be taken out of service as an influent storage tank but remain available for use as emergency storage;
    b. The 100,000 gallon steel influent storage tank (100K tank);
    c. The two 26,000 gallon concrete clarifiers located within Building 1 of TA-50;
    d. The two 25,000 gallon concrete effluent storage tanks (WM2-N, WM2-S); and
    e. The gravity filter located within Building 1 of TA-50.

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Upon the cessation of operation of these specific units, the Permittees shall initiate the requirements for stabilization (Condition 42) of the individual units, systems and components in accordance with this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

41. **STABILIZATION OF INDIVIDUAL UNITS AND SYSTEMS** - Within 1290 days from the permanent cessation of operation of a unit or system, the Permittees shall submit to NMED for approval a written work plan for the stabilization of the unit or system for which operation has ceased. ~~.~~ The work plan shall identify ~~characterization~~ activities to be taken, and steps necessary to ensure that the unit or system can no longer receive a discharge and that no further releases of water contaminants occur as a result of the unit or system. At a minimum, the work plan shall include the following:

a. Identification of the unit or system in which cessation of use has occurred;
b. A detailed description of the function of the unit or system;
c. A detailed description of the historic influent waste streams to the unit or system;
d. A detailed description of all conveyance lines leading to the unit or system and a description of how the lines will be terminated, plugged, re-routed or bypassed so that a discharge to the unit or system can no longer occur;
e. Identification of those portions of the ~~approved~~ Closure Plan required in Condition 434 of this Discharge Permit that will be implemented;
f. A description of all proposed interim measures, actions and controls that will be implemented until such time of final removal of the unit, system or component to prevent the release of water contaminants into the environment; to prevent water contaminants, including storm water run-on and run-off, from moving into ground water; and to prevent water contaminants from posing a threat to human health;
~~f.g. A detailed description of the actions that will be taken to investigate and characterize, to the extent possible given site constraints, the potential impact to soil and groundwater from the facility, system, or individual unit;~~ and
~~g.~~h. A schedule for implementation.

Upon NMED approval of the work plan, the Permittees shall implement the plan according to the approved schedule.

Within 30 days following the completion of all interim measures, actions and controls as required by this condition, the Permittees shall submit to NMED for approval a final written report on the actions taken to implement the partial closure. ~~The Permittees' workplan and final written report along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

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[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

42. **CLOSURE PLAN**~~-~~ Within 180 days from the effective date of this Discharge Permit (by DATE) the Permittees shall submit to NMED for approval a written closure plan for the Facility. The closure plan shall identify steps necessary to perform final closure of the Facility, including all units and systems at the Facility.

Comment [RB2]: DOE and LANS will submit a Closure Plan to NMED on or before December 31, 2015.

At a minimum, the closure plan shall include the following:

a. A detailed description of how each unit and system at the Facility will be closed.
b. A detailed description of the actions to be taken to decommission, demolish, and remove each unit, system, and other structure, including any secondary containment system components.
c. A detailed description of the actions and controls that will be implemented during closure to prevent the release of water contaminants into the environment; to prevent water contaminants, including run-on and run-off, from moving into ground water; and to prevent water contaminants from posing a threat to human health.
~~c. A detailed description of the actions that will be taken to investigate and characterize, to the extent possible given site constraints, the potential impact to soil and groundwater from the facility, system, or individual unit.~~
d. A detailed description of the methods to be used for decontamination of the site and decontamination of equipment used during closure.
e. A detailed description of the actions that will be taken to reclaim the site, including placement of clean fill material and re-grading to blend with surrounding surface topography, minimize run-on and run-off, and prevent infiltration of water, and re-vegetation.
f. A detailed description of all monitoring, maintenance and repair, and controls that will be implemented after closure, and of all actions that will be taken to minimize the need for post-closure monitoring, maintenance and repair, and controls.
g. A ground water monitoring plan to detect water contaminants that might move directly or indirectly into ground water after closure, which shall provide for, at a minimum, eight consecutive quarters of ground water monitoring after achieving the standards of NMC~~S~~A 20.6.2.3103..
h. A detailed description of the methods that will be used to characterize all wastes generated during closure, including treatment residues, contaminated debris, and contaminated soil, in compliance with all local, state, and federal laws and regulations.
i. A detailed description of the methods that will be used to remove, transport, treat, recycle, and dispose of all wastes generated during

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closure in compliance with all local, state, and federal laws and regulations.

j. A detailed schedule for the closure and removal of each unit and system, which lists each proposed action and the estimated time to complete it.

If the Permittees make any changes to the Facility that would affect the implementation of the approved Closure Plan, the Permittees shall submit to NMED for approval a written notification and an amended Closure Plan. Permittees will provide annual updates to NMED describing modifications to the Closure Plan. ~~All documents required to be submitted to NMED in this Condition by the Permittees along with NMED's responses shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~ Public comments will be accepted by NMED regarding this submittal for a period of 30 days prior to finalizing conditions to the Closure Plan.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

~~42.~~43. **FINAL CLOSURE**-Upon cessation of operation of the Facility, system or individual unit, the Permittees shall implement the approved Closure Plan according to the approved schedule therein.

Once closure begins, and until all closure requirements (excluding post-closure ground water monitoring) are completed, the Permittees shall submit to NMED, with the monitoring reports required in this Discharge Permit, quarterly status reports describing the closure actions taken during the previous reporting period and the actions scheduled for the next reporting period. Within 90 days following the completion of the closure, the Permittees shall submit to NMED for approval a final written report on the actions taken to implement closure. ~~The Permittees' quarterly status reports and final written report, along with NMED's response, shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

~~43.~~44. **POST-CLOSURE GROUND WATER MONITORING-** After closure has been completed and approved by NMED, the Permittees shall continue ground water monitoring of any wells dedicated to the Facility according to the approved Closure Plan to confirm that the standards of 20.6.2.3103 NMAC are not exceeded and toxic pollutants in 20.6.2.7.WW NMAC are not present in ground water. Such monitoring shall continue for a minimum of eight consecutive quarters.

If monitoring results show that a ground water quality standard in 20.6.2.3103 NMAC is exceeded or a toxic pollutant in 20.6.2.7.WW NMAC is present in ground water, the Permittees shall implement the requirements of Condition 38 (Ground Water Exceedance) of ~~contingency plan set forth in~~ this Discharge Permit.

This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the March 1, 2005 Compliance Order on Consent (Consent Order) agreed to by NMED, DOE, and the Regents of the University of California (predecessor to LANS).

Upon demonstration confirming ground water quality does not exceed the standards of 20.6.2.3103 NMAC and does not contain a toxic pollutant in 20.6.2.7.WW NMAC, the Permittees may submit a written request to cease ground water monitoring activities. ~~The Permittees' request for cessation of ground water monitoring along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

Following notification from NMED that post-closure monitoring may cease, the Permittees shall plug and abandon the monitoring well in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1,* March 2011.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.F NMAC, 20.6.2.4103.D NMAC]

~~44.~~45. **TERMINATION-** When all closure and post-closure requirements have been met, the Permittees may submit to NMED a written request for termination of the Discharge Permit. ~~The Permittees' request to terminate along with NMED's response shall be posted, by the Permittees, on LANL's Electronic Public Reading Room located at http://eprr.lanl.gov/oppie/service (or as updated).~~

If the Discharge Permit expires or is terminated for any reason and any standard of 20.6.2.3103 NMAC is or will be exceeded, or a toxic pollutant in 20.6.2.7.WW NMAC is or will be present in ground water, NMED may require the Permittees to submit an abatement plan pursuant to 20.6.2.4104 NMAC.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.F NMAC, 20.6.2.4103.D NMAC]

46. **INTEGRATION WITH THE CONSENT ORDER** – The investigation, characterization, cleanup and corrective action requirements for potential releases of contaminants into soil, groundwater and other environmental media from the Facility and associated "solid waste management units" (SWMUs) and "areas of concern" (AOCs) is governed under the Compliance Order on Consent (March 1, 2005) (Consent Order) entered into between the New Mexico Environment Department and the Permittees pursuant to the New Mexico Hazardous Waste Act, NMSA 1978, §74-4-10 and the New Mexico Solid Waste Act, NMSA 1978, §74-9-36(D) (*see* http://www.nmenv.state.nm.us/HWB/documents/LANL_10-29-2012_Consent_Order_-_MODIFIED_10-29-2012.pdf). The Consent Order provides at Section III.A that it was established to 1) fully determine the nature and extent of releases of contaminants (as that term is defined at Section III.B) at SWMUs and AOCs, 2) identify and evaluate, where needed, alternatives for corrective measures, including interim measures, to clean up contaminants in the environment, and to prevent or mitigate the migration of contaminants at or from SWMUs and AOCs; and 3) to implement such corrective measures. The Facility, tanks, vaults, former storage area, and all associated influent and effluent lines are identified as SWMUs and/or AOCs under the Consent Order (Section **IV.B CANYON WATERSHED INVESTIGATIONS)** and subject to its requirements (for a full description *see* the Investigation Report for Upper Mortandad Canyon Aggregate Area, Revision 1 (http://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-10-02046)). The investigation, characterization, cleanup and corrective action at the Facility and associated SWMUs and AOCs shall be conducted solely under the Consent Order as provided for under Section III.W.1, and not under this Permit. No activities required under this Permit shall conflict with or duplicate activities required for SWMUs and AOCs identified under the Consent Order.

E. General Terms and Conditions

~~45.~~47. **APPROVALS** - Upon receipt of a work plan, written proposal, report, or other document subject to NMED approval, NMED will review the document and may either approve the document, approve the document with conditions, or disapprove the document. Upon completing its review, NMED will notify the Permittees in writing of its decision, including the reasons for any conditional approval or disapproval.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

~~46.~~48. **RECORD KEEPING** - The Permittees shall maintain a written record of the following information and shall make it available to NMED upon request:

a. Information and data used to prepare the application for this Discharge

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Permit.

b. Records of any releases or discharges not authorized in this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.
c. Records, including logs, of the operation and maintenance and repair of all Facility and equipment used to treat, store or dispose of waste water.
d. Facility record drawings (plans and specifications) showing the actual construction of the Facility and shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).
e. Copies of monitoring reports completed and submitted to NMED pursuant to this Discharge Permit.
f. The volume of waste water or other wastes discharged pursuant to this Discharge Permit.
g. Ground water quality and waste water quality data collected pursuant to this Discharge Permit.
h. Copies of construction records (well logs) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit.
i. Records of the maintenance and repair, replacement, and calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit.
j. Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit.

With respect to sampling and laboratory analysis, the Permittees shall record and maintain following information and shall make it available to NMED upon request:

a. The dates, location and times of sampling or field measurements;
b. The name and job title of the individuals who performed each sample collection or field measurement.
c. The sample analysis date of each sample.
d. The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis.
e. The analytical technique or method used to analyze each sample or collect each field measurement.
f. The results of each analysis or field measurement, including raw data;
g. The results of any split, spiked, duplicate or repeat sample.
h. All laboratory analysis chain-of-custody forms and a description of the quality assurance and quality control procedures used.

The written record shall be maintained by the Permittees at a location accessible during a Facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to NMED upon request.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.D NMAC, 20.6.2.3109.B NMAC]

49. **ELECTRONIC POSTING** - Commencing on the effective date of this Discharge Permit, Permittees voluntarily agree to post on LANL's Electronic Public Reading Room (located at http://eprr.lanl.gov/oppie/service (or as updated)), the information listed below within 10 business days of the due date specified in the relevant permit condition or, in the case of NMED responses, within 10 business days of receipt by Permittees.

PERMIT CONDITION	INFORMATION/REPORT
VI.A.1	Annual Update
VI.A.2	Notification of Changes
VI.A.8	Water Tightness Testing
VI.A.9	Summary Report for Settled Solids Depth Results
VI.A. 12	Proposal for Alternative Freeboard Levels and NMED Responses
VI.A.17	Written Confirmation of Installation of Flow Meters
VI.B.20	Quarterly Monitoring Reports
VI.B.26	Soil Moisture Monitoring System for SET and NMED Response
VI.B.27	Ground Water Flow Direction Report
VI.D.44	Closure Plan and NMED Response
VI.D.45	Final Closure – Quarterly Reports, Final Report, and NMED Responses
VI.D.46	Post-Closure Request to Cease Ground Water Monitoring and NMED Response
VI.D.47	Request for Termination of Discharge Plan and NMED Response

This permit condition is not enforceable under 20.6.2.1220 NMAC or NMSA 1978 Sections 74-6-10 through -10.2, as amended from time to time, and is not subject to civil or criminal fines and/or penalties associated with permit requirements under Permit Sections 52 and 53.

~~47.~~50. **INSPECTION AND ENTRY** – The Permittees shall allow inspection by NMED of the Facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

The Permittees shall allow NMED to have access to and reproduce any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge

Permit and the WQCC regulations.

Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED in the WQA, the WQCC Regulations, or any other local, state or federal laws and regulations.

[NMSA 1978, §§ 74-6-9.B and 74-6-9.E, 20.6.2.3107.D NMAC]

~~48.~~51. **DUTY TO PROVIDE INFORMATION** - The Permittees shall, upon NMED's request, allow NMED to inspect and duplicate any and all records required by this Discharge Permit and furnish NMED with copies of such records.

Nothing in this Discharge Permit shall be construed as limiting in any way the authority of NMED to gather information as stipulated in the WQA, the WQCC Regulations, or any other local, state or federal laws and regulations.

[NMSA 1978, §§ 74-6-5.D, 74-6-9.B, and 74-6-9.E, 20.6.2.3107.D NMAC, 20.6.2.3109.B NMAC]

~~49.~~52. **MODIFICATIONS AND AMENDMENTS**– In the event the Permittees propose a change to the Facility or the Facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the Facility, the Permittees shall notify NMED prior to implementing such changes. The Permittees shall obtain written approval (which may require modification of this Discharge Permit) from NMED prior to implementing such changes.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.C NMAC, 20.6.2.3109.E NMAC,]

~~50.~~53. **EXTENSIONS OF TIME - The** Permittees may seek an extension of time in which to perform an obligation in this Discharge Permit, for good cause, by sending a written request for extension of time that states the length of the requested extension and describes the basis for the request. NMED shall respond in writing, stating the reasons for any denial.

~~51.~~54. **CIVIL PENALTIES** - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or Facility, or any refusal or failure to provide NMED with records or information, may subject the Permittees to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10.C and 74-

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6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the Permittees waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit.

[NMSA 1978, §§ 74-6-10 and 74-6-10.1]

~~47.~~55. **CRIMINAL PENALTIES** – The WQA provides that no person shall:

a. Make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained in the WQA;
b. Falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained in the WQA; or
c. Fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation.

Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15.

[NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]

~~52.~~56. **COMPLIANCE WITH OTHER LAWS** - Nothing in this Discharge Permit shall be construed in any way as relieving the Permittees of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.

[20.6.2 NMAC]

~~53.~~57. **LIABILITY**- The Permittees shall be jointly and severally liable for all

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their obligations in this Discharge Permit.

[NMSA 1978, §§ 74-6-5.A and 74-6-10]

~~54.~~58. **RIGHT TO APPEAL** - The Permittees may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC, shall be filed within thirty days of the receipt of this Discharge Permit, and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.
[NMSA 1978, § 74-6-5.O]

~~55.~~59. **TRANSFER OF OWNERSHIP**- Prior to the transfer of any ownership, control, or possession of this Facility or any portion thereof, the Permittees shall:

a. Notify the proposed transferee in writing of the existence of this Discharge Permit;
b. Include a copy of this Discharge Permit with the notice; and
c. Deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee.

Until both ownership and possession of the Facility have been transferred to the transferee, the Permittees shall continue to be responsible for any discharge from the Facility.

[20.6.2.3104 NMAC, 20.6.2.3111 NMAC]

~~56.~~60. **PERMIT FEES**- Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date.

Permit fees are associated with issuance of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the Permittees of the obligation to pay all permit fees assessed by NMED. If the Permittees cease discharging at or from the Facility during the term of the Discharge Permit, they shall nevertheless pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the Permittees fail to remit payment when due.

[20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]

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VII. Permit Term and Signature

EFFECTIVE DATE: [effective date]
TERM ENDS: [expiration date]
[20.6.2.3109.H NMAC, NMSA 1978, § 74-6-5.I]

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

ENCLOSURE 2

SET liner and leak detection system
product data sheets

ENV-DO-15-0137

LA-UR-15-23614

Date: MAY 2 0 2015

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PRODUCT DATA SHEET

GSE Leak Location Smooth Geomembrane

GSE Leak Location is a smooth spark-testable high density polyethylene (HDPE) geomembrane that contains an integrated, specially formulated conductive layer on the bottom surface of the geomembrane. GSE Leak Location can be easily tested for post-installation damage using equipment capable of performing spark testing in the field per ASTM D7240. This product is used in applications that require post-installation testing on the liner system to increase the quality of the project.

[*]

AT THE CORE:
An HDPE geomembrane used in applications that require post-installation leak testing on the liner system to increase the quality of the project.

Product Specifications

These product specifications meet GRI GM13

Tested Property	Test Method	Frequency	Minimum Average Value			
			40 mil	60 mil	80 mil	100 mil
Thickness, mil Lowest individual reading	ASTM D 5199	every roll	40 36	60 54	80 72	100 90
Density, g/cm³	ASTM D 1505	200,000 lb	0.940	0.940	0.940	0.940
Tensile Properties (each direction) Strength at Break, lb/in-width Strength at Yield, lb/in-width Elongation at Break, % Elongation at Yield, %	ASTM D 6693, Type IV Dumbbell, 2 ipm G.L. 2.0 in G.L. 1.3 in	20,000 lb	 152 84 700 12	 228 126 700 12	 304 168 700 12	 380 210 700 12
Tear Resistance, lb	ASTM D 1004	45,000 lb	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	45,000 lb	72	108	144	180
Carbon Black Content(1), % (Range)	ASTM D 1603*/4218	20,000 lb	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note(2)	Note(2)	Note(2)	Note(2)
Notched Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lb	500	500	500	500
Oxidative Induction Time, mins	ASTM D 3895, 200°C; O_2, 1 atm	200,000 lb	> 100	> 100	> 100	> 100
TYPICAL ROLL DIMENSIONS						
Roll Length(3), ft			870	560	430	340
Roll Width(3), ft			22.5	22.5	22.5	22.5
Roll Area, ft²			19,575	12,600	9,675	7,650

NOTES:
- (1)GSE Leak Location may have an overall ash content greater than 3.0%. These values apply to the non-conductive black layers.
- (2)Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- (3)Roll lengths and widths have a tolerance of ±1%.
- GSE Leak Location is available in rolls weighing approximately 3,900 lb.
- All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77°C when tested according to ASTM D 746.
- *Modified.

GSE is a leading manufacturer and marketer of geosynthetic lining products and services. We've built a reputation of reliability through our dedication to providing consistency of product, price and protection to our global customers.

Our commitment to innovation, our focus on quality and our industry expertise allow us the flexibility to collaborate with our clients to develop a custom, purpose-fit solution.

GSE ENVIRONMENTAL™

[DURABILITY RUNS DEEP] For more information on this product and others, please visit us at GSEworld.com, call 800.435.2008 or contact your local sales office.

PRODUCT DATA SHEET

GSE HyperNet Geonet 250 - 300 mil

GSE HyperNet geonet is a synthetic drainage material manufactured from a premium grade high density polyethylene (HDPE) resin. The structure of the GSE HyperNet geonet is formed specifically to transmit fluids uniformly under a variety of field conditions. The geonet is formulated to be resistant to ultraviolet light for a period of time necessary to complete the installation.

[*]

AT THE CORE:
A synthetic geonet engineered specifically to transmit fluids consistently under a variety of field conditions.

Product Specifications

Tested Property	Test Method	Frequency	Minimum Average Roll Value		
			250 mil	275 mil	300 mil
Geonet Thickness, mil[1]	ASTM D 5199	1/50,000 ft^2	250	275	300
Transmissivity[2], gal/min/ft (m^2/sec)	ASTM D 4716	1/540,000 ft^2	14.49 (3×10^{-3})	28.98 (6×10^{-3})	38.64 (8×10^{-3})
Density, g/cm^3	ASTM D 1505	1/50,000 ft^2	0.94	0.94	0.94
Tensile Strength (MD), lb/in	ASTM D 7179	1/50,000 ft^2	55	65	75
Carbon Black Content, %	ASTM D 4218	1/50,000 ft^2	2.0	2.0	2.0
NOMINAL ROLL DIMENSIONS[3]					
Roll Width, ft			15	15	15
Roll Length, ft			290	270	250
Roll Area, ft^2			3,750	4,050	3,750

NOTES:
- [1] Geonet thickness is nominal value.
- [2] Gradient of 0.1, normal load of 10,000 psf, water at 70° F, between steel plates for 15 minutes. Contact GSE for performance transmissivity value for use in design.
- [3] Roll widths and lengths have a tolerance of ±1%.

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Our commitment to innovation, our focus on quality and our industry expertise allow us the flexibility to collaborate with our clients to develop a custom, purpose-fit solution.

[DURABILITY RUNS DEEP] For more information on this product and others, please visit us at GSEworld.com, call 800.435.2008 or contact your local sales office.

GSE ENVIRONMENTAL™

PRODUCT DATA SHEET

GSE Nonwoven Geotextiles

GSE Nonwoven Geotextiles are a family of staple fiber needlepunched geotextiles. The geotextiles are manufactured using an advanced manufacturing and quality system to produce the most uniform and consistent nonwoven needlepunched geotextile currently available in the industry. GSE combines a fiber selection and approval system with an in-line quality control and a state-of-the-art laboratory to ensure that every roll shipped meets customer specifications.

[*]

AT THE CORE:
A family of geotextiles used for separation, filtration, protection and drainage applications.

Product Specifications

These product specifications meet GRI GT12, GRI GT13 and AASHTO M288

Tested Property[(1)]	Test Method	Frequency	Minimum Average Roll Value					
			NW4	NW6	NW8	NW10	NW12	NW16
AASHTO M288 Class			3	2	1	>1	>>1	>>>1
Mass per Unit Area, oz/yd²	ASTM D 5261	90,000 ft²	4	6	8	10	12	16
Grab Tensile Strength, lb	ASTM D 4632	90,000 ft²	120	160	220	260	320	390
Grab Elongation, %	ASTM D 4632	90,000 ft²	50	50	50	50	50	50
CBR Puncture Strength, lb	ASTM D 6241	540,000 ft²	303	435	575	725	925	1,125
Trapezoidal Tear Strength, lb	ASTM D 4533	90,000 ft²	50	65	90	100	125	150
Apparent Opening Size, Sieve No. (mm)	ASTM D 4751	540,000 ft²	70 (0.212)	70 (0.212)	80 (0.180)	100 (0.150)	100 (0.150)	100 (0.150)
Permittivity, sec⁻¹	ASTM D 4491	540,000 ft²	1.80	1.50	1.30	1.00	0.80	0.60
Water Flow Rate, gpm/ft²	ASTM D 4491	540,000 ft²	135	110	95	75	60	45
UV Resistance % retained after 500 hours	ASTM D 4355	per formulation		70	70	70	70	70
TYPICAL ROLL DIMENSIONS								
Roll Length[(2)], ft			850	850	600	500	400	300
Roll Width[(2)], ft			15	15	15	15	15	15
Roll Area, ft²			12,750	12,750	9,000	7,500	6,000	4,500

NOTES:
- [(1)]The property values listed are in weaker principal direction. All values listed are Minimum Average Roll Values except apparent opening size in mm and UV resistance. Apparent opening size (mm) is a Maximum Average Roll Value. UV is a typical value.
- [(2)]Roll lengths and widths have a tolerance of ±1%.

HYDRO-TEMP™, Inc.

EWA-SYSTEM – the most reliable leak detection system available today!

Enclosed please find information concerning the Hydro-Temp EWA System, electronic water (liquid) leak detection and climate monitoring system. Introduced in 1972 this system is the most effective, most flexible and most reliable system for the protection of valuable assets. EWA denotes Early Warning Alarm. Early warning is necessary if you want to avoid the flood/disaster or environmental calamity.

The basic purpose for the EWA System is to detect water leaks (or any aqueous liquid leaks) while simultaneously monitoring temperature, humidity and water levels anywhere these conditions are of a critical nature. This highly reliable system is being used in applications such as data processing centers, equipment rooms, museums, multistory buildings, condominiums, power plants, record storage facilities and other facilities where moisture and/or climate considerations are critical.

A unique feature of the EWA System is the method of lineal leak detection. The lineal leak detector tape (B-11) consists of a pair of stainless steel sensors woven into a durable flat polyester tape or ribbon. This low profile detection tape can be glued flat to the subfloor of computer, control and clean rooms, underneath air handling ducts, or near any potential source of water damage. A typical B-11 tape zone can vary in size. This leak detector tape may be strapped, glued or stapled vertically or horizontally to piping, walls, ceilings, and cabinets or around equipment to detect water leaks. It will sense as little as 2 drops of water and other aqueous liquids, even deionized water. The sensitivity level of each leak detector may be independently adjusted so that different types of liquids or conditions can be monitored using a common microprocessor based control unit (EPC-50/32 Control). Yes, the EPC-50/32 is capable of simultaneous monitoring of variable input processes utilizing the B-11 Leak Detection Tape, spot detectors, level detectors, temperature and humidity sensors.

The expandable EPC-50/32 Control Unit continuously self-monitors (supervises) its own power supply, as well as each detection zone or input. As few as one (1) and as many as thirty-two (32) inputs, or zones of protection, may be monitored using a single control unit. If a device or zone is not functioning properly, a FAULT will register and the defective zone or input will be independently annunciated on the control unit LCD display. The EPC-50/32 Control is capable of initiating one or more zone specific countermeasures, or interface with remote notification devices such as a modem, graphic annunciator, building management system, logging printer, etc.

Please review the enclosed product information. If you have any questions or need more information, please feel free to contact me at (1) 225-751-1200. If you wish, you may visit our WEB Site @ www.hydro-tempinc.com.

Sincerely,

Ken Myrick

EWA SYSTEM FEATURES

EARLY WARNING ALARM FOR WATER LEAK DETECTION & ENVIRONMENTAL MONITORING

EPC-50/32 Control Unit - Micro-processor Based

- Designed to meet user's needs - monitors up to 32 zones or inputs
- Designed to accommodate various conditions of protected areas
- May be used in other many types of applications – computer rooms, record storage facilities, museums, multi-story buildings, equipment/electrical/telecommunication rooms, etc.
- LCD display, 2 line X 16 alphanumeric characters – identifies location of "ALARM" and "FAULT"
- Keypad - operator interface for programming, viewing & lockout feature for security of system
- Monitors 1-32 independently wired inputs (optional)
- Multiple outputs - RS-232 and optional relay interface available
- Common relay outputs -ALARM & FAULT and ALARM HORN
- Adjustable detection sensitivity and alarm set points for each zone
- 24 hour Battery Back-up
- Cost efficient

Liquid Leak Detection & Environmental Monitoring

- Features *lineal* leak detection
- Spot & level detection
- Temperature monitoring

Early Warning Alarm at leak stage

- Prevents flood/disaster
- 95% of floods are prevented when detected at leak stage

Lineal Leak Detection Tape - B-11

- Detects water, including de-ionized water, & other aqueous or conductive liquids (not hydrocarbons)
- Laid out in small zones surrounding potential source of leak – highest degree of location accuracy
- Military grid - for maximum degree of redundancy – best detection method & highest degree of accuracy as compared to competitive systems
- Every inch glued to surface - avoids bridging, damage and cable migration
- Sensitivity adjustable - by zone – each zone independent – eliminates "false alarms"
- Low profile - .5 mm high - avoids damage (not damaged when stepped on)
- Lineal leak detection - superior to spot detection and other cable systems
- No incidence of electrolysis
- 2 year limited warranty - on control unit

Redundant Detection Capability

- Proper design allows redundancy - other zone(s) in close proximity (each zone independent of the others)
- Subsequent or multiple alarm capability - tracks flow or progress of leak and locates point of "FAULT"

Zoned System

- Build-up to size system required
  - 1-32 zones / inputs per EPC-50/32 Control Unit
- Simultaneous multiple device monitoring
  - Lineal leak detection using unique B-11 tape
  - Water levels - sump, drain, drain pans, etc.
  - Spot Detection
  - High -Low temperature sensors - real time value viewing
  - Other devices
- Multiple outputs - RS-232, modem hook-up, accessory by-zone & summary
  - Remote annunciation - summary or by zone using optional EPC-RI8 relay output interface
  - Corrective measures - sump pump activation, solenoid water cut-off, shutdown, etc.
  - Interface with computer or building management system

Low Service Profile

- Easy to service and repair
- Low long-term maintenance costs
- Satisfied customers since 1971

REV 10/11 EWAFEATR.DOC

EWA SYSTEM USERS – PARTIAL LIST

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EWA SYSTEM - PLANNING GUIDE

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I. **The Rationale for Developing the EARLY WARNING ALARM (EWA) System: DP Protection.** The Hydro-Temp, Inc. *EWA System* was developed to protect data processing operations from environmental hazards. However, it was soon proven effective in protecting other critical faculties and environmentally sensitive areas. Water and climatic damage are the leading causes of computer downtime and building damage, not to mention collateral damage. In certain computer installations, planners see it as the leading hazard-*ahead of fire and malicious acts.* The National Insurance Institute reports that 35 percent of data center insurance claims are as a result of water damage, three times more than claims for fire related damage. This is true for other type facilities as well. The *EWA System* has the *capability* and *flexibility* required by those facilities, regardless of their size and sophistication. Site and facilities planners can depend on the *EWA System* to do its job, protecting their precious facilities, valuables and equipment from water and climatic hazards-around the clock.

WHAT A BASIC ***EWA SYSTEM*** DOES:

- Detects water leaks or intrusion and climatic changes.
- Provides an early warning when a leak or climatic problem occurs.
- Identifies where the problem is.
- Provides output capabilities for remote alarming, graphic annunciation, computer or building management interfacing and corrective control functions.

II. **Other EWA Applications** (See Exhibit B, **"EWA Applications,"** for a more complete listing of applications.)
Condominiums and multistory buildings (i.e.,mechanical rooms, penthouse equipment rooms, water & sewer mains, etc.)
Computer, Control, UPS and battery rooms - Museums, collections and galleries, record storage and archives
Telephone control, communications, and switching facilities - Water-cooled computers and electrical equipment
Heating, ventilating and air conditioning (HVAC) systems - Microwave relay stations - Cable trays and tunnels
Ships and other marine applications - Industrial, commercial and institutional applications

III. **EWA Water (aqueous liquids) and Climatic Detectors and Their Uses:**

A. **Liquid Detector Tape - Model B-11:** The liquid detector tape (warranty - 3 years) is used to detect aqueous liquids, including de-ionized water, glycol, acid, etc. The lineal leak detector tape is used: (1) to protect buildings, equipment and facilities against water intrusion (or other aqueous liquids) and; (2) to detect leakage from pipelines or vessels. Normally 6-8 drops of water will trigger an early warning but can be adjusted for greater or lessor amounts of aqueous liquids. The EPC series control units allow alarm level (or sensitivity adjustment) for each zone or input. The important consideration is that we detect the problem at the leak stage, rather than the broken pipe or container stage in order to **prevent the flood or disaster.** The *EWA System* control instruments are designed to simultaneously monitor multiple zones of detector tape along with other devices. It is not recommended that another manufacturer's equipment be used to monitor the liquid detection tape. The following are important considerations for using Liquid Detection Tape as opposed to using other types of detectors such as cable or spot detectors.

1. **Construction and profile of the Detector Tape:** Because of the necessity for durability, it goes without saying that construction of the detector has to be a primary consideration. Our B-11 Liquid Detector Tape can withstand "axial tension" load of 322 lbs. The tape is constructed of rugged, specially woven polyester with two type 302 stainless steel detector wires tightly woven into it. However, if we place the tape in "harms way," the ultimate tensile load is of little use. Thus, the following considerations come into play which further enhance the durability of the tape.

a. **Method of installation** - Our method of installation, which will be explained in more detail later, actually helps in many ways to improve not only the durability but also the performance of the detector. The **entire surface** of the flat detector tape is glued to the floor or surface using a thin film of approved adhesive or glue. This process holds the detector tape firmly to the floor or surface; thus, stress to the tape is not a factor. Being held flush to the floor enables it to detect even a thin film of a leaking liquid along its entire length. Detection "Cables," used by some competitive companies, are only clipped to the floor or surface using cable clips 4 - 12 feet apart. Most detector cables are quite rigid and do not lay flat to the surface. Therefore, sections of the cabling which rise off the floor, forming a "bridge," allowing water to flow under it undetected. Additionally the cable clips and connectors hold the cable off the floor forming "bridges." Unlike our detector tape, cables can't be glued to the floor. The glue would interfere with the detection of a liquid or would "contaminate" the cable.

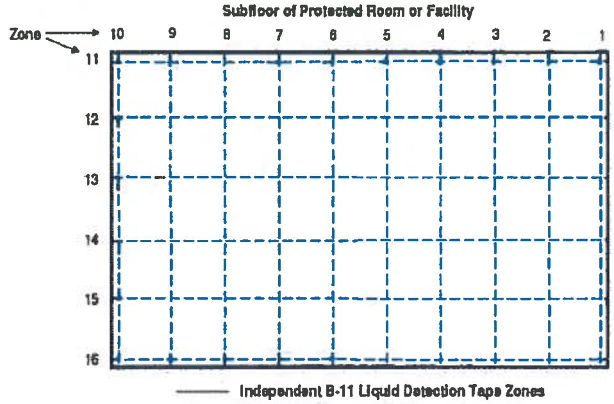
b. **Detector profile** - This is an important consideration due to possible damage to detectors. High profile cables are easily snagged and may become damaged from heavy cables being dragged over, or lying on top of them. Cable detectors are frequently damaged when stepped on. Since our detector tape has a very low profile surface (less than .5mm) and is glued along its entire bottom surface, it is not easily snagged or damaged by heavy cables being dragged over it. Damage to our detector tape is rare. Stepping on the Liquid Detector Tape will not damage it unless it is placed such that it is walked on day in and day out. When damage does occur, repair is simple and economical. The tape may simply be cut and spliced. Conversely, cable repair will require replacement of fifty to one hundred feet at $6.00 to $8.00 per foot, plus labor.

c. **Detector tape construction:** Our durable detector tape is specially woven for two major purposes, durability and wicking. This special weave also prevents our approved installation adhesive from penetrating the weave, which could prevent detection. The weave enhances detection such that a small amount of liquid is wicked rapidly to the detector sensors allowing for early warning of an impending problem, PREVENTING the DISASTER. Since the material is non-absorbent it, **dries in just a few minutes and is ready for reuse.** The high quality type 302 stainless steel detector sensors are very durable and resists deterioration due to chemicals, etc. In addition, we have eliminated any occurrence of electrolysis. Our B-11 Liquid Detection Tape is **warranted for three years,** no questions asked.

2. **Detector Tape Layout Methods:** Typically the Liquid Detection Tape is applied to ceilings, walls, floors and sub-floors to provide a "protective envelope" or zone around the object(s) being protected. As few as 1 or as many as 32 zones can be designed and monitored using our EPC-50/32 Control Unit. Additional zones (more than 32) would require additional control(s). The Liquid Detection Tape may be applied in several other ways:
   - In plenums such as under the raised floor of a computer room
   - Inside equipment
   - Along pipelines
   - On ventilation ducts
   - Under the roof or beneath skylights
   - Cable trays, tunnels or raceways, etc.

Because of the critical nature of the facility to be protected, a major consideration in tape layout is **redundancy. Redundancy** allows for detection, even in the event one zone may already be in a "FAULT" or "ALARM" condition, by having other **(redundant)** zones in close proximity that will detect the leak. **Redundancy** in the computer room is extremely important. The layout designs below will illustrate how this may be accomplished.

a. **Grid Layout:** Used to detect intrusion of water (or other aqueous liquids) into the protected area, or sub-floor of a computer room, the tape is normally adhered directly to the concrete. A preferred method that offers the most complete coverage is to apply a band of tape around the entire sub-floor perimeter of the computer room and within 6 - 12 inches of the wall. Then apply parallel bands of tape on 5, 10 or 15-foot centers across the entire length and breadth of the area(s) to be protected. Each parallel band would be considered a zone. **(See Figure 1).** When using the "grid" method, 200 plus feet per zone is not uncommon. These zones of tape are then connected to the EWA control instrument.



Note: Grid Layout Allows For Redundant Protection

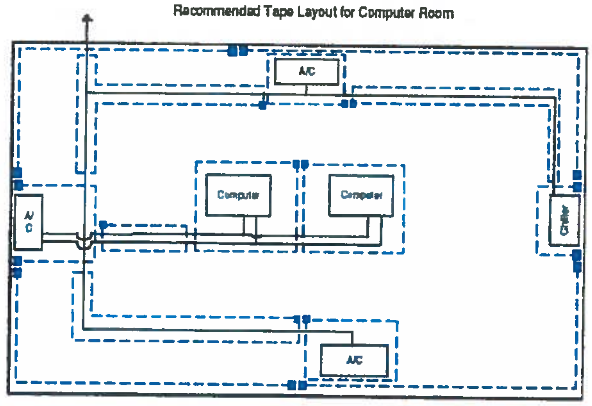
FIGURE 1 - GRID LAYOUT

The "grid" design, even though more costly initially, may save time and expense over the long haul. Once the grid system is installed you don't have to remember to change the leak detection system each time a pipe, air handler or water-cooled mainframe computer is added or moved. Alarms annunciated are plotted on an X, Y axis map of the protected area or facility. They also may be displayed using a graphic anunciator. The perimeter zones are used to detect water intrusion into the under floor area from likely sources of leakage such as air conditioning or process coolant lines, drain lines, humidifier supply lines and water pipes. Intrusion from adjacent bathrooms or other areas of a building is detected as well.

b. **Surrounding the potential leak source layout:** This second method of applying the tape also involves designing independent areas or zones of protection within a facility or room (computer room, clean room, control room, etc.) as follows:

1. Apply Liquid Detection Tape on the floor 6 - 12" from walls, around entire perimeter. Each perimeter zone should be easily identified and capable of being visually checked.
2. Form a "tape barrier" to the sub-floor around air conditioning and water cooled units, humidifiers, water/liquid piping, water cooled equipment, boilers, storage tanks, etc. Each known source of a potential leak should be a separate zone. A suggested technique for piping raised off the floor is to install the tape on the sub-floor running parallel to the piping to be monitored for leaks. If several pipe runs are involved, individual zones of tape should be used, connected to the inputs of the *EWA System* control unit.
3. Provide detection for specific water hazards in adjoining rooms if at all practical. Be sure to zone separately. Detect problems before they reach equipment. Again, this includes the floor, drains, sumps, ceiling, attic, etc., above the computer room or hazards on the same floor but away from the computer room, such as water mains which are common sources of computer room flooding.
4. Keep zones small enough (usually 25 - 100' of tape per zone) so that small leaks can be quickly detected and the source of the leak is easily identified. Tape should not be placed within 4 feet of air handling units. (See Figure 2).

Recommended Tape Layout for Computer Room



Independent B-11 Liquid Detection Tape Zone
Terminal Blocks
Note: Layout Allows For Redundant Protection

FIGURE 2 - SURROUND THE SOURCE LAYOUT

c. **Piping layout (non-sub-floor applications):** One rule of thumb for pipe layout, such as sprinkler piping in a warehouse, is: up to 1,000 feet of tape may be used per zone or loop if the tape is visible and not hidden as in the sub-floor of a computer room. If the tape is visible, when an alarm occurs, one can merely walk the length of the zone observing the detector to determine at which point the leak is located. There are two methods to apply the tape in these cases, straight run and serpentine. The straight run is simply applying the tape straight down the entire length of a pipe run. The "serpentine" method entails defining an area of detection (or zone) say 25' x 25'. Then apply the Liquid Detection Tape to all piping in that area - down one pipe run to the far edge of the zone, jump over to the next pipe and run the tape back and so on and thus the "serpentine" layout. (See Figure 3). Using this method the entire warehouse or facility piping is set up in square or rectangular shaped zones.

If the piping is elevated, above a ceiling or high up as in a warehouse, the tape will normally be strapped to the bottom of horizontal sections of pipelines. On vertical or near-vertical sections of pipelines, the detector tape will be applied in connected rings several inches apart, or wound around the pipe in a bias or spiral fashion. In all cases, the intent is to place the tape in the path of any liquid should a leak occur in the pipe. (See Figure 4).

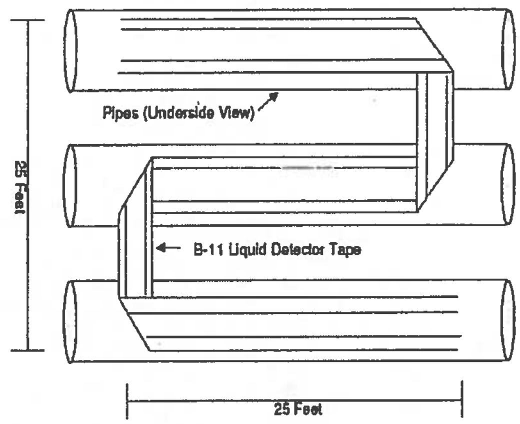


FIGURE 3 - PIPE LAYOUT - SERPENTINE

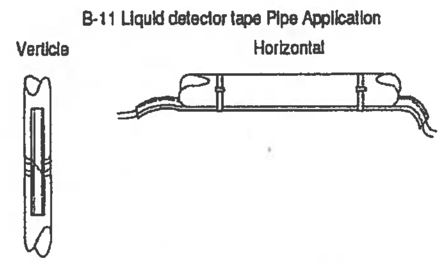


FIGURE 4 - VERTICAL & HORIZONTAL PIPE LAYOUT

3. **Installation:** Because liquid leak detection using a lineal detector tape may be new to you, the following points may be helpful in planning tape installation:

   a. The B-11 Liquid Detector Tape is 1 1/8 inches wide, .5mm thick and has two stainless steel wires woven into the fabric called detectors. The B-11 is available in rolls of 250 feet and is cut to the desired length during installation. Monitored by a Hydro-Temp control instrument, the B-11 tape will provide an alarm when in contact with as few as two drops (adjustable) of conductive liquid. High humidity normally does not cause an alarm, unless it results in condensation dripping on the tape surface or condensation present on a pipe to which the tape is applied. However, each zone's sensitivity level is adjustable through the operator keypad on the ***EWA System*** control unit.

   b. The method used to fasten the tape depends upon the requirements of the individual project. When applying to a surface such as concrete, the most popular method is to press the tape firmly onto a continuous film of approved adhesive or glue. Again, gluing the detector tape to the floor has several advantages over the "clipping" method used for cable system. When properly glued to the floor the tape lies flat on the floor to avoid "bridging", (Bridging occurs when the detector lifts off the floor allowing water to run under the detector without detection), avoids migration or moving out of place when computer or other cables are dragged over the detectors and; avoids damage to the detector. Because the liquid detector tape is flat (.5mm high) it will not be affected if someone steps on it or lays something on it periodically.

   c. When applying the B-11 directly to the piping, the tape is simply strapped to the pipe.

d. Regardless of the method used to fasten the tape, care should be taken to prevent the wire detectors in the tape from coming into contact with any electrically conductive material causing a "FAULT" condition. These methods are further described in the "Detectors Installation and Technical Manual." Anything used in applying the tape, which interferes with the wicking capability of the fabric, may adversely affect the detector's function.

e. Tape should not be installed on or under piping or equipment upon which condensation may form then drip on to the tape causing an alarm.

f. The tape should not be installed directly under an air-handling unit, but around the unit.

g. In the sub-floor of a computer room the tape should be installed after the raised floor pedestals, conduit and piping are installed and the sub-floor cleaned and sealed.

4. **Contamination:** One of the major problems with lineal leak detectors is "contamination", resulting in false or nuisance alarms or the inability to reset the system after an alarm. **The construction of the B-11 Liquid Detector Tape avoids contamination.** But if and when it does occur the corrective procedure is very simple. Just wipe the tape with a damp cloth and a small amount of mild detergent and you are back in operation. Cable systems, because of their construction, often trap contamination such as mop water, glycol, dust, etc. A flat tightly woven tape traps little contamination.

5. **Lineal vs. Spot Detection:** Spot detection has its place. But, where a lineal detector can be used the spot detector has no place. The fact is water or liquids must make its way to the "spot" the detector is protecting. Because the lineal detector (B-11) is used to surround the source of the leak, there is no escape for the liquid. The chances of the liquid reaching the spot detector are far less, except when a lot of water has leaked in the area. The object is to avoid the "lot of liquid" condition in order to avoid costly damage, shut down, clean up of large areas or flooded rooms, etc. **PREVENT THE FLOOD/DISASTER.**

B. **Level Detector (N-2):** A level detector is used where small amounts of liquids (water) may be permissible but where it is desirable to monitor any change in liquid levels. Typical applications are drains, sump areas, fan rooms, sump pits, floor drains, channels, and basements or cellars. Level detectors are also used to prevent overflow from catch basins, drain pans and the like. HVAC applications are numerous. The level detector can actually be dropped down a drain in order to detect water backing up the drain, before it reaches the surface. Where continuous monitoring of rising liquid levels is desired, a series of detectors fixed at pre-established levels may be used. (See Figure 5).

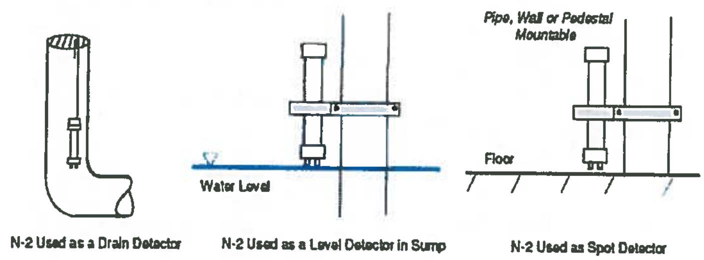


FIGURE 5 - N-2 LEVEL/SPOT DETECTOR

C. **Spot Detector (N-2F):** This low-profile spot detector is used where concentrated or localized water problems are possible. It is used where installation of tape may be inappropriate, or difficult. Potential uses include condensate pans under air-handlers or humidity control equipment, beneath freezers or coil units, small areas where early warning of small water leaks are not critical or as a redundant detector used in conjunction with other detectors. (See Figure 6).

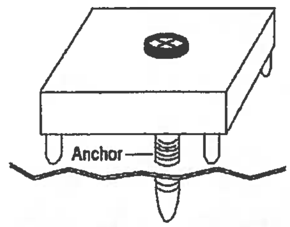


Figure 6 - N-2F Floor Mountable Spot Detector

D. **Humidity Sensor (HS-3): (DISCONTINUED) Monitoring** both high and low humidity are important in critical areas such as computer rooms, libraries, archives, museums, critical process and manufacturing areas. If air circulation is normal, one detector should be provided in each 900 square feet of space and within 45 feet of the object(s) being protected. High and low alarm set points are programmed into the EPC Control Unit using the keypad on the face of the control. For best operation, the HS-3 should not be installed near existing humidistats or directly in the airflow from a humidifier.

E. **Temperature Detector (TS-1):** For best performance, temperature detectors normally should not be installed near other thermostats or directly in front of supply air registers. As with the humidity detectors, if air circulation is normal, one detector should be provided in each 900 square feet of area and within 45 feet of the object(s) being protected. High and low alarm set points are user programmed into the EPC Control Unit. In a typical installation where both increasing and decreasing levels of humidity and temperature are to be monitored, humidity and temperature detectors are wall mounted at a convenient level. The likelihood of damage by traffic or movement of equipment within the room should be considered when locating the detectors.

F. **Other Detectors or Sensors:** Resistance, thermister and process variable inputs/devices, other than those discussed above, can easily be connected to and monitored by EWA System control instruments. With the ***EWA System*** control instrument used as a multi-purpose control and annunciator panel, security devices including any of the following may be used: magnetic contacts, motion and magnetic detectors, switch mats, ribbon switches, heat sensors, fire and smoke detectors, and a variety of intruder, climate and other alarm devices or sensors. ***Please note:*** With the ***EWA System***, all normally open contact detectors are supervised by installing an end-of-line resistor. Any break in continuity is indicated by a "FAULT" (or trouble) signal at the control unit. Hydro-Temp, Inc. should be contacted if any questions arise regarding a particular detector's compatibility with any ***EWA System*** control instrument.

IV. **EPC-50/32 Control Unit.** When considering leak detection, one must consider a control unit that will allow the flexibility to meet the needs of the particular application in mind. The *EWA System* EPC-50/32 is a control unit that has been developed based upon over 28 years experience in the leak detection business. The EPC-50/32 can monitor up to 32 zones or inputs. These direct wired zones/inputs can be used for leak detection and other devices as explained previously.

Earlier we discussed redundancy as one of the most important considerations when designing a leak detection system. The EPC-50/32 accommodates direct wired zones or inputs. Many systems claim to be "zone" type systems but only provide multiple points of protection along a single cable run. Truthfully, these systems are "multi-point uni-zone" systems. That is, if at one point a leak is detected, the control unit annunciates a "zone" indication. The problem with this approach is that many of these systems cannot give "subsequent alarms" for the event of another leak occurring in other zones, or, annunciating that the original leak is rapidly progressing and could develop into disastrous proportions. Therefore, redundancy is not accommodated and these systems, however expensive, actually provide only limited capability or protection. Additionally, if a break in the main trunk cable occurs, the "continuity" or fault indication is annunciated on the control unit. In that event, the entire system is rendered incapable of detection of a leak until the continuity or fault has been corrected. With some systems, the location of the break is not given and one must "scout it out" through a time consuming and costly process to say nothing of what could happen in the meantime if a serious leak were to occur.

Another problem exists with many systems that give "by-foot" readout of the "location" of the water leak. One company even claims that they can "pinpoint" the location of the water leak. This will be explained further in Paragraph V. "The Zoned System vs. Serpentine with By-Foot Readout."

The EWA System is a true zone system. That is, each zone is independent one from the other. Each zone or input (or zones) is annunciated when an "ALARM" or "FAULT" or multiple alarms or faults conditions occur. The following will give you more insight as to the capability of our EPC-50/32 Control Unit and how we avoid the problems discussed previously.

A. **Independent Wired Zones or Inputs:** The EPC-50/32 Control Unit can monitor 1-32 independently wire zones or inputs. Independent zoning provides the ultimate redundant capability. A 2-conductor signal wire to the control unit independently connects each zone. This approach is more costly in wire and labor time, but many designers and users prefer this because of the degree of independence of one zone from the other.

B. **Multiple Device Monitoring:** Economy is a prime consideration for the design of a leak detection and environmental monitoring system. Our EPC-50/32 provides economy through the capability to simultaneously monitor many different types of devices including leak detection tape, spot, level, temperature and humidity detectors, door contacts and so on. A detector (input) or zone (leak detector) may be as far away as 1,000 or more feet from the control unit. Beyond 1,000 feet Hydro-Temp should be consulted for proper wire usage.

C. **Sensitivity Adjustment (avoid nuisance alarms):** Sensitivity of water or liquid detectors has been a major concern over the years and has caused much frustration on the part of the engineers, installers and users of these systems. Most systems that provide sensitivity adjustment do not have the capability to adjust specific areas or zones, but not affect other zones. In this case, the entire system must be de-sensitized to prevent nuisance alarms this rendering it less capable of providing the level of protection desired - system wide.

The EPC-50/32 allows one to adjust the sensitivity of each leak detection zone independent of all others. For example: if one zone is located in an area which seems to have more moisture than another, the operator may, using the keypad on the EPC-50/32 control unit, adjust the sensitivity of that zone in order to avoid nuisance alarms. Detection capability is not affected by proper adjustment while nuisance alarms are avoided.

Through many years of experience we have learned the relationship among three important factors that few of our competitors fail to understand. Those relationships involve: (1) the ambient condition of the area or zone of protection; (2) the liquid to be detected and (3) the resistivity of that liquid. This knowledge has allowed us to incorporate into our EPC-50/32 microprocessor, a non-lineal "hydrohm" scale which will allow for the simple sensitivity adjustment(s) required for a particular application and/or area (zone) to be adequately protected, and without problems. Even de-ionized water can be detected.

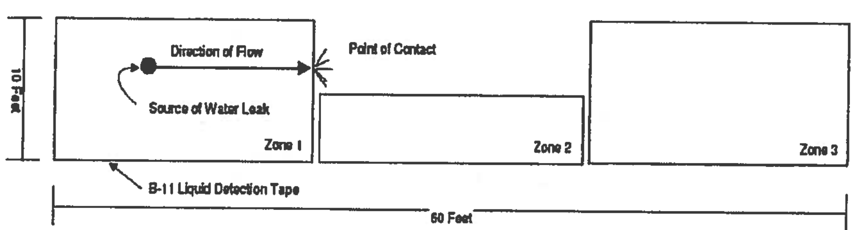
D. **Outputs:** The EPC-50/32 includes two RS-232 outputs. One for interfacing with a logging printer, building management system, for modem operation, etc., and the other is used for form C, by-zone, relay outputs using our optional EPC-RI8 Relay Interface. Common form C relay outputs for ALARM, FAULT, and HORN are standard features.

E. **Stand Alone System:** Another advantage to the EPC-50/32 is that this is a stand-alone system. It is not a part of another control, i.e., air conditioner or air handling unit, fire alarm system, etc., such that if the control function of one of these devices fail, the leak detection system would be rendered useless as well. The stand-alone system is the best approach for prevention of critical potential disasters, such as could result in the event of a water leak or broken pipe. The EPC-50/32 provides for 36 hours battery back up (optional) and has a variety of output capabilities in order to annunciate an alarm condition.

F. **Mounting:** The EPC-50/32 control unit normally should be mounted on a wall in a clean, conspicuous location. This may be adjacent to a fire or burglar control panel, in a guard station or reception area within the building.

V. **Zoned system v. Serpentine with By-Foot Readout, (Lineal Leak Detection).** One of the many advantages one has when using the *EWA System* is the ability to design a lineal leak detection system and protect by "zone". As mentioned before, a zone usually covers a small area around the potential source of water, such as around an air-handling unit, water cooled mainframe computer or parallel to pipe runs. The advantage of our zoned system is that water does not escape the square or rectangular zone as shown in Figure 2, page 4, and Figure 7a.

FIGURE 7A - ZONES OF PROTECTION



Conversely, if the "serpentine" method is used (the method used when applying most cable systems), water can actually flow parallel to the cable (detector) for some distance before coming into contact with the cable. In the sub-floor of a computer room many obstacles lay between the source and the detectors, such as, conduit, cabling, hoses, etc., which can channel the water away from the detector causing false location readings. (See Figure 7B).

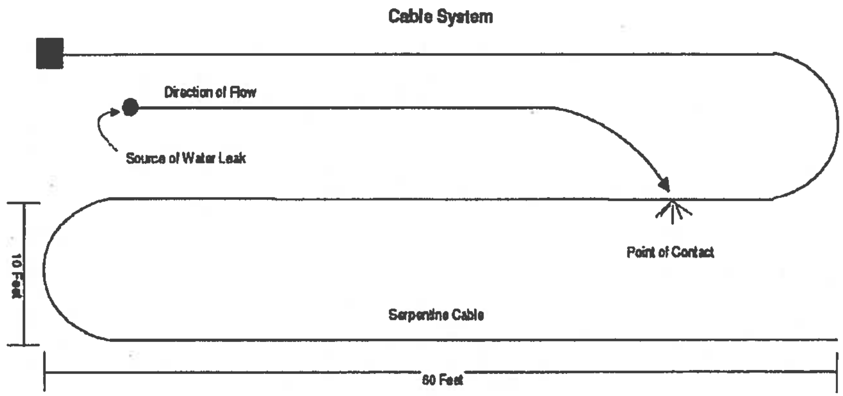


FIGURE 7B – SERPENTINE METHOD

The degree of accuracy for most cable systems is no greater than 1%. Therefore, if the detection cable is serpentined around a computer room sub-floor, to a total cable length of 1,000 feet, the "pinpoint" accuracy is +/- 10 feet. That means that the actual point of contact with the cable may be anywhere along a 20' length or spread (See Figure 8). As you can now see, this approach is often not that accurate and is a very expensive process. With the recommended EWA detector tape, layout by zone approach, these problems do not exist. There is no escape for the leaking liquid. We are assured of a zone indication in close proximity to the source of the leak. Most designs are such that the end and sides of a zone are no more than 10 - 15 feet from the center of that zone.

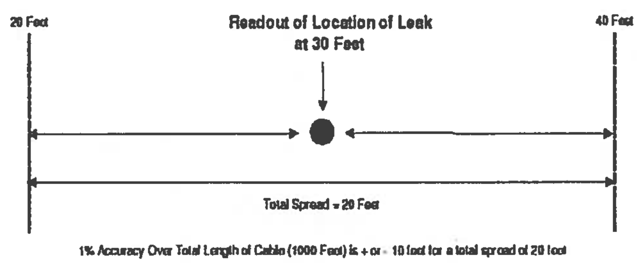


FIGURE 8 - "PINPOINT" ACCURACY

VI. **Site Inspection and System Planning:** In most cases, it is first necessary to decide upon the (1) kind and (2) degree of protection required. Planning may involve these considerations:

A. Location of central control instrument. (See Section IV). Important factors are accessibility, visibility, environmental control, and protection from accidental damage and from tampering.

B. How the control instrument is to be powered. EPC control units require 115 VAC power outlet for the EPC-TR 110/12VAC transformer (UL listed). Backup power is available for the EPC Control Units, (36 hours - no additional cabinet required - the back-up battery fits into the control cabinet).

C. Will remote location of LED's, lamps, or buzzers for alarm and/or "fault" (trouble) indications be required? In operations with a high noise level or with a number of visual distractions, it may be desirable to provide an external buzzer and/or strobe near the control instrument.

D. How will control output(s) be monitored? A number of possibilities exist:

1. Local monitoring only (by personnel, security guards, etc.).
2. Central alarm station connection.
3. Automatic telephone dialer (pre-recorded message or digital output).
4. Computer readout.
5. Building Management System (BMS).

E. Is remote annunciation and/or logging of events required?

1. Summary annunciation
2. Graphic annunciation
3. Logging printer

F. Are automatic corrective measures desired in the system? For example:

1. Closing valves
2. Starting or stopping equipment, i.e., blower, pump, shut off valve.

G. Water problems: For existing operations, an on-site inspection of the premises is highly desirable. The help of the building's engineer, manager, superintendent or consultant may be needed in locating pipelines and other potential sources of water damage as well as defining any considerations related to the building's HVAC system and/or water system to include the sprinkler system. At this time site conditions are important. Fit the proper detector to the existing conditions. Hydro-Temp's EWA System provides a shopping list of control features and detectors to fit the needs of the facility. This flexibility, if properly used, results in a high level of user satisfaction.

H. Installation - will the system be installed by in facility or contract installers? An "EWA System Installation Labor Estimate" table will give some guidance as to installation labor hours. (See Exhibit A below)

EXHIBIT A

EWA SYSTEM INSTALLATION LABOR ESTIMATE

ITEM NUMBER	ITEM	ESTIMATED LABOR HOURS PER ITEM
EPC-50/32	Control Unit (includes all wiring)	3.00
HS-3	Humidity Sensor	.25
TS-1	Temperature Sensor	.25
TH-1/3	Temperature & Humidity Sensor - Single Hsng	.35
N-2 or N-2F	Level/Spot Detector	.50
B-11	Liquid Detector Tape per 60 ft.	1.00
	Connecting external wiring to one of the internal relays in control unit	.05
	Final System Inspection	.10/zone (1 hr min.)

Note 1: Labor units are only estimates applying to new construction and reasonable installation conditions. The actual installation time will vary based upon conditions. Hydro-Temp, Inc. makes no guarantee that these numbers are valid, but are estimates to be used with discretion.

Note 2: These estimates do not include wiring from the control unit to the detectors, time required for installation or conduit or for pulling of wires through conduit.

EXHIBIT B

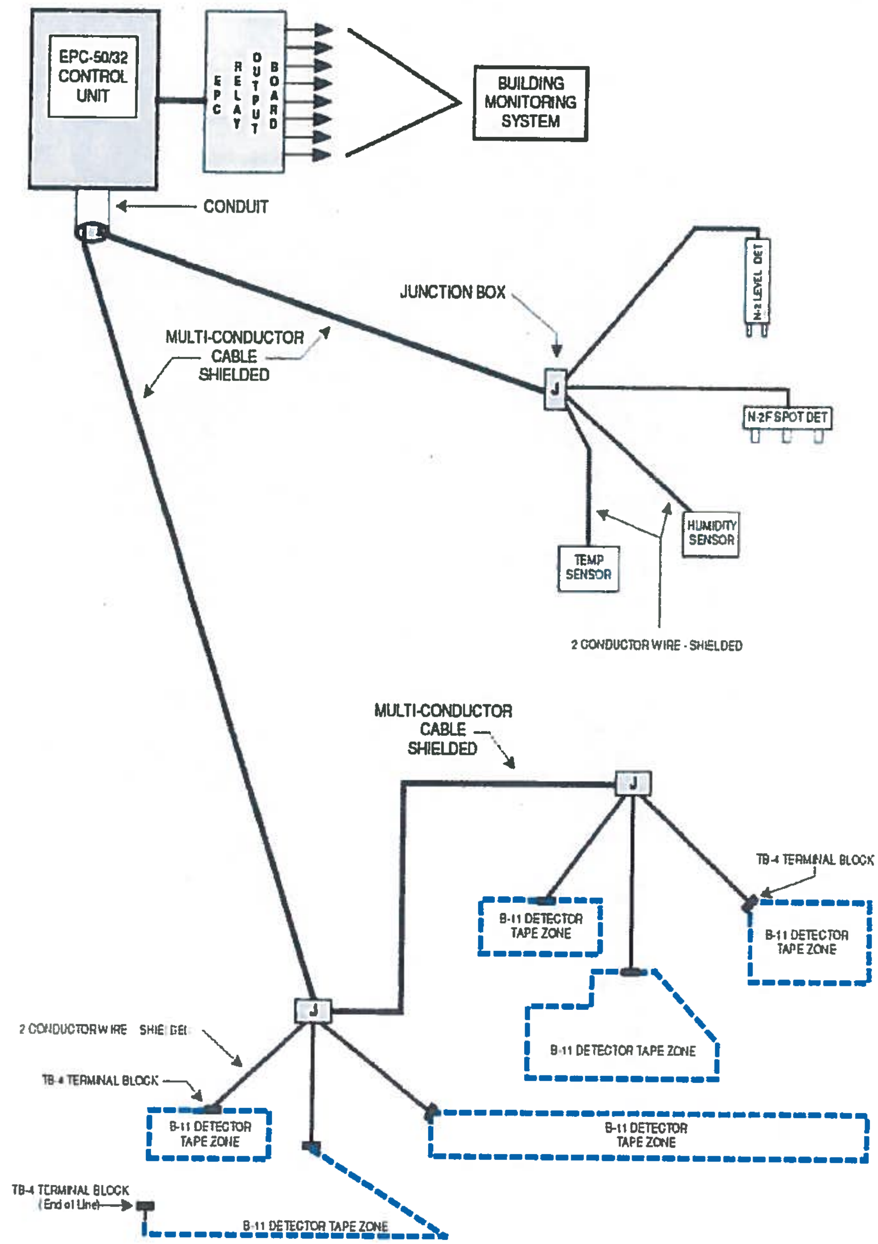
EWA APPLICATOINS CHART

Primary EWA Function[1]	Application
a,l	Acid (industrial) leak detection
a,l	AIR CONDITIONING SYSTEMS (FOR LEAKAGE)
a,l,h,t	Archives
a,l,h,t	ART GALLERIES AND MUSEUMS
a,l	Basements (for flooding, plumbing leaks, etc.
a,l,h,t	Battery rooms
a,l,h,t	Chemical storage - special (sodium, etc.)
a,l,h,t	CLEAN ROOMS
a,l,h,t	CONDOMINIUMS/APARTMENTS
a	Control systems, electric
a,l	Conventional power plants for leakage
a,l	COMPUTERS, WATER-CHILLED
a,l,h,t	DATA PROCESSING CENTERS
a,l,h	Dry assembly areas
a,l,h	Dry storage
a,l,h,t	Electronic, electrical equipment storage
a,h,t	Environmental cambers leakage
a,l,h,t	Foodstuff storage
a,l,h,t	Furriers' storage
a,l,h	Glass storage (transformers, etc.)
a,h,t	HOSPITAL labs, operating, critical care & MRI rooms
a,l	Hotels, multi-story buildings (for flooding, plumbing leaks, etc.
a,l,h,t	Laboratories (medical, research, testing, etc.)
a,l,h,t	Libraries and rare book rooms
a,l,h,t	Magnetic tape storage centers
a,l,h,t	Marine applications

Primary EWA Function[1]	Application
a,l,h,t	MECHANICAL ROOMS
a,l,h,t	Microwave relay stations
a,l,h,t	Military mothballing facilities
a,l,h,t	Museums
a,l,h,t	MULTI-STORY BUILDINGS - pipe chases
a,l,h,t	Nuclear power plants
a,h,t	Pharmaceutical storage
a,h,t	Photographic chemicals storage
a,l,h	Printing plants
a,l,h,t	Process control rooms
a,l	Process cooling for computers, etc. (leakage detection)
a,l,h,t	Records depositories
a,t	Refrigeration supervision supermarkets, cold storage
l	ROOF SYSTEMS
a,l,h	Safety deposit vaults
a,l	Solar heating and cooling systems (for water leakage)
a,l	SPRINKLER SYSTEM PIPING
a,l,h,t	Subterranean or surface electrical facilities (transformers, etc.)
a,l,h,t	Telecommunications rooms
a,l,h,t	Telephone exchanges
a,l,h,t	Transformer and Switch Gear rooms
a,l	Water-cooled electrical equipment for leakage
a,l,h,t	Warehousing
a,t	Water heater/boiler leakage

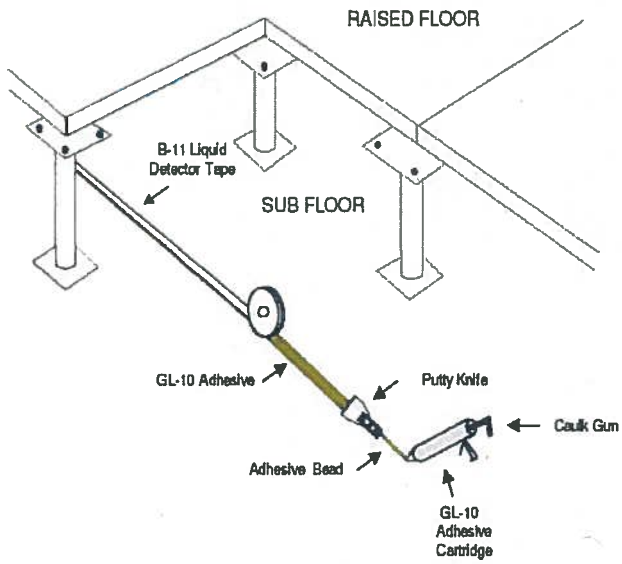
[1]a: annunciation l: liquid (leak) detection h: humidity detection t: temperature detection (Example: "a,l,h,t/Data processing centers." Protection of dp operations from environmental hazards (flooding, water leaks, overheating, high humidity, etc.) is vitally important. For a dp center, an EWA System installation may include an EWA control unit for annunciation (a), liquid (l) detectors for potential water intrusion problems, both humidity (h and temperature (t) sensors to monitor climatic conditions)

EWA SYSTEM - LINE & BLOCK WIRING DIAGRAM



13122

B-11 TYPICAL SUB-FLOOR INSTALLATION DRAWING



WHEN INSTALLING LIQUID DETECTOR TAPE, PLEASE NOTE

1. Any adhesive that alters the chemical composition of the tape must be avoided. Any use thereof voids any warranty, expressed or implied.

   Use only the approved adhesive provided by Hydro-Temp

2. Be sure to inspect the area where the tape is to be applied for the presence of chemical materials that could create problems.

   If in doubt about such chemical materials, we recommend cleaning the floor with a mild detergent before applying the tape. Be sure to rinse the cleaned area thoroughly after using the detergent.

DETECTOR TAPE – INSTALLATION PROCEDURE

DETECTOR TAPE – INSTALLATION PROCEDURE

MATERIALS NEEDED:

1 – 1½ INCH PUTTY KNIFE
2 ½ DIAMETER, 3' LONG PVC PIPE
CAULK GUN FOR ADHESIVE USED TO GLUE B-11 DETECTOR TAPE TO FLOOR (SURFACE)
TB-4 TERMINAL BLOCK(S)

INSTALLATION PROCEDURE: (Read this procedure entirely before performing the first step)

1. Keep B-11 tape clean and dry prior to use.
2. Make sure surface to which the tape is being applied is clean, dry and free of grease oil or any substance, which would adversely affect adhesion to the surface.
3. Use chalk line, when possible, to mark the layout of the tape to insure a neat, straight-line installation.
4. When retrofitting: Clear a path for the B-11 by elevating all seal-tite, EMT, cables, etc. If these cannot be moved, elevate them with a board (2X4 or 2X6), turning the board on edge once it is slid under cables, etc., so the tape may be run under them. If detector tape is to be placed under or over metal piping or conduit, wrap the conduit or pipe with and insulating tap (such as electrical tape) then place the detector under or over the pipe or conduit.
5. Glue or screw terminal block to the surface where the tape zone is to begin. Connect the lead wire from the control unit or module to one side of the terminal block and the detector tape detector wires will be connected to the opposite side.
6. Apply a bead, (approximately 1/8th - 1/4th inch wide) along the line for the detector tape.
7. Use a putty knife to spread adhesive into a flat, thin film, 1 inch wide. Allow to become tacky so the detector tape will adhere, upon being applied to adhesive. (Note 1: *Scrape excess adhesive from edges of detector tape to prevent a glue dam or ridge.*) (Note 2: *Off-spool the desired length of detector tape, while at the same time placing the leading end of tape between thumb and fingers, using a clean glove or cloth, applying appropriate pressure to tape while applying slight reverse angle to the coil of the tape. Pull the tape through the thumb and fingers. This action will reverse the coil nature of the tape such that it will lay flat up placing it on the adhesive. Again, this process eliminates the coiled nature such that it will lay flat and not coil or curl up from the adhesive. This process may take 2 persons for longer runs of detector tape but only takes a few second or minutes per zone or area covered by that length of tape. Cut tape to the appropriate length.*)
8. Lay B-11 along center of adhesive using the PVC to press it into the adhesive. **Remember adhesive must be quite tacky at the time of placement of the detector tape on the adhesive.**
9. Use the 3" PVC to go back over the detector tape to insure that the tape is thoroughly secured by the adhesive. The adhesive should not penetrate the tape. If penetration occurs use a damp cloth to clean the tape.
10. When making turns, fold the tape over itself and place a piece of electrical tape at the fold such that the detector probes do not touch the other. Secure the electrical tape around the detector tape at the same time insuring that the detector tape remains flat and not gathered up by the electrical tape.
11. At the end of the tape run for a zone, glue or screw a terminal block to the surface and attach the detector wires as appropriate. Install the end of line resistor in the opposite positions of the terminal block.

LEAK DETECTION & ENVIRONMENTAL MONITORING

SPECIFICATIONS

INSTALLATION REQUIREMENTS

AND

SYSTEM DESCRIPTION

HYDRO-TEMP™, inc.

INFORMATION SERVICES - P O BOX 389 LA CENTER WA 98629-0389

LEAK DETECTION & ENVIRONMENTAL MONITORING SPECIFICATIONS
INSTALLATION REQUIREMENTS AND SYSTEM DESCRIPTION

1.01 SCOPE OF WORK

A. Provide and install all equipment, conduit, and other materials for a complete and operational environmental monitoring system. The system shall be modular and expandable as herein specified or as the Owner may direct up to full system capacity.

B. The equipment, which shall become the system, is described herein and shall be furnished by the contractor. The contractor in accordance with the requirements also described herein shall furnish all installation materials, drawings, etc.

C. The system shall be installed in a neat professional manner and in accordance with the instructions contained in applicable manufacturer installation manuals.

1.02 QUALITY ASSURANCE

A. The environmental monitoring system shall be installed in accordance with and conform to the requirements of:

1. National Electrical Code [NEC]
2. Underwriters' Laboratories [UL]
3. National Electrical Manufacturer's Association [NEMA]
4. American National Standards Institute [ANSI]
5. Local Codes, Bylaws, Ordinances, Regulations and Authorities having jurisdiction.

1.03 JOB CONDITIONS

A. Drawings and Specifications:

1. Exact locations of all items shall be indicated by reference to the general plans and measurements of the building and shall be subject to the approval of the User.
2. Should any change to the proposed contract drawings be deemed necessary by the contractor, the shop drawings, descriptions, and the reason for the proposed changes shall be submitted to user and/or the building owner.

1.04 DEFINITIONS

A. **Alarm Condition:** Any condition detected by sensing devices whenever environmental tolerances are exceeded or liquids are detected.

B. **Buzzer:** An audible alarm device installed in the control unit to indicate a trouble/fault or alarm condition.

C. **Detection Loop:** The term given to the length of the liquid detector tape run, i.e., loop, from the control unit to monitored area and return to control unit.

D. **Grid Pattern:** A diagram depicting the installation path of the liquid detector tape. Each section (grid) comprises a separate protective zone.

E. **Humidity Sensor:** A sensor device used to issue an alarm when the relative humidity either rises or falls outside of preset limits.

F. **LED:** A light emitting diode installed on the control unit, that illuminates to indicate an alarm or fault condition in any zone or type of sensing device or power indication.

G. **LCD:** Liquid crystal display that displays alarms or faults, in a specific zone, and other system information and values.

H. **Keypad:** Used for programming, alarm reset and status/condition of detectors monitored by the control unit.

I. **Level Detector:** A sensor device used to transmit a signal when electrically conductive liquids reach a predetermined level, i.e., in an air conditioning condensate overflow pan.

J. **Liquid Detection Tape:** Two parallel detection sensors woven into a specially treated ribbon of cloth capable of detecting water or other electrically conductive liquids.

K. **Self-Monitoring:** The capability of a control unit to self transmit checking pulses to detector loops, electronic units, etc. to check for any electrical fault that might be indicated when there is no response to the checking pulses.

L. **Temperature Sensor:** A sensor device used to issue an alarm when the temperature either rises or falls outside of preset limits.

M. **Fault Conditions:** An audible and visual alarm that is sounded whenever circuit problems are encountered within the system.

PART 2--PRODUCTS

2.01 GENERAL DESCRIPTION

A. The climate/environmental monitoring system as described herein consists of a solid state based microprocessor control unit, liquid detector tape, humidity detectors, temperature detectors, spot and level detectors and other sensing devises. The total integration of these devices combined with the capability to generate local (and/or remote) audible and/or visual alarms, provides an around the clock monitoring of specified detectors or sensing devises.

B. Designated areas shall be equipped with spot leak detectors and liquid detection tape which, when activated, shall generate audible and visual alarms at the control unit. Temperature and humidity sensors shall be installed to generate audible and visual alarms at the control unit when the humidity or temperature rises above or falls below set parameters.

2.02 CONTROL UNITS

A. The climatic/environment control unit should be a microprocessor based expandable, independently operated and powered, solid state device capable of monitoring up to thirty-two (32) independent zones or inputs, with continuous fault supervision and alarm condition response. The control unit shall include built-in battery backup capability that will provide 24 hours standby power.

B. The water leak/climate control unit includes the following:

1. Thirty-two (32) detection zones/inputs, LCD readout indication, including input value and program review.
2. One (1) display to monitor the power supply
3. Calendar clock which displays, on the LCD, date and time of all alarm activity.
4. Fault summary indication
5. Alarm summary indication
6. Built-in alarm/fault buzzer
7. Keypad for field programming each zone or input, including sensitivity, alarm set-point adjustment and keyboard lock.
8. Built-in relays for activating common external devices and annunciators for system fault and alarm, and an optional capability for independent zone/input alarm conditions.
9. RS-232 serial interface for logging printer, building management system or modem hook-up.
10. Countermeasure capability for system or zone alarms.
11. Contacts for remote annunciation - (dry contact closure and open).
12. Complete system standby battery operation for a minimum of 36 hours. Batteries recharged automatically.

C. The control unit must be designed for automatic continuous self-testing.
1. Each detector loop is continuously checked or supervised.
2. A fault in any detector loop shall be indicated when the LCD display, for the specific zone/input that is tested, illuminates in response to the checking or supervision,

D. The control unit must include a method to turn off alarms and clear memory upon correction of the alarm/fault condition(s).

E. The control unit contains built-in alarm and fault relays, tripped by zone fault or alarm. The relays may also be used for connection to remote monitoring stations.

F. Detector/input connections shall be capable of accepting normally open, thermister and process variable sensors/inputs. An alarm shall be provided when values violate programmed limits.

2.03 LIQUID DETECTION TAPE

A. The liquid detection tape shall consist of two parallel non-magnetic stainless steel detection sensors woven into specially treated ribbon. The detection tape shall be no higher than .5mm and no wider than 1 1/8 inches wide.

B. The tape is capable of detecting two (2) or more drops of water, or other electrically conductive liquids. No more than twenty (20) drops of liquid shall be required on any tape zone to generate an alarm. Sensitivity adjustment, at the control unit for each tape zone, shall accommodate the desired level of detection.

C. The tape shall be placed in the path of any potential liquid intrusions on floor and ceiling, i.e., around air handling units, parallel to water lines, condensate lines, and around the perimeter of other equipment and the protected area or facility.

1. Tape shall be applied in grids or zones.
2. Each tape loop/zone shall not exceed 200 feet where the tape would normally be visible.
3. Where the tape is concealed or not easily accessible, tape runs should be limited to no more than 75 feet per detector loop, with the exception, around the perimeter of the protected facility.

D. The tape shall be securely fastened to the mounting surfaces, with no bridging or gaps (spaces) between detector tape and protected surfaces, using approved adhesive. When secured to piping wire ties may be used instead of adhesive.

E. Each detection zone shall be wired to the environmental control panel.

2.04 HUMIDITY SENSOR (DISCONTINUED)

A. Humidity sensors shall sense conditions and shall generate alarms on increasing relative humidity or decreasing relative humidity. Sensors shall sense conditions when humidity moves outside preset limits.

1. The sensing range for high humidity detectors shall be from 0 percent to 100 percent.

B. Humidity sensors shall be set to the desired high and low humidity alarm ranges. User shall determine the humidity range of the detectors.

C. Each humidity sensor in each area of the room shall be wired to comprise one zone and interconnected with the environmental control panel.

D. Detectors shall be mounted on walls or columns within the protection range of 900 sq. ft. and/or within 30 feet of equipment being protected. Detectors shall not be mounted within the immediate vicinity of control devices used with heating and cooling equipment.

2.05 TEMPERATURE SENSOR

A. Temperature Sensors shall sense conditions and provide alarms when the temperature rises or falls outside preset limits.

B. The detector shall be set to the desired alarm ranges as provided by User.

C. Temperature Sensors shall be wired to comprise individual zones and interconnected with the environmental control panel.

D. Detectors shall be mounted on walls or columns within the protection range of 900 sq. Ft. and/or within 30 feet of equipment being protected. Detectors shall not be mounted within the immediate vicinity of control devices used with heating and cooling equipment.

2.06 LIQUID LEVEL/SPOT DETECTORS

A. Spot detectors shall consist of a high impact plastic cage containing stainless steel detector probes capable of permanent mounting on a flat surface (spot detector) with a screw through the body, or on a bracket (level detector) for sensing of rising fluid level.

B. The liquid level detectors shall be wired to comprise independent zones with all zones interconnected with the environmental control panel.

2.07 OPERATING SEQUENCE FOR WATER LEAK/CLIMATIC MONITORING

A. Normal condition: If no zones are in alarm or fault condition, the normal status of the control unit shall be indicated by the power display.

B. Fault condition: If one of the following faults occur:

1. Any zone is in fault condition or,
2. No primary power and unit is operating on standby batteries.
3. With condition 1 and/or 2 the following will occur:
   a. Control unit fault relay will trip.
   b. If a zone fault, the LCD will give an alphanumeric indication of the zone, type sensor, date, time, and I. D. or location.
   c. If a primary power fault, power display will be off.
   d. The control unit's fault LED will light and buzzer will sound until manually silenced or the condition is restored to normal.

C. Alarm condition: If an alarm condition is sensed from any detection device (liquid detection tape, humidity sensors, temperature sensor, liquid level detector or other detector/ sensor):

1. Control unit alarm relay will trip.
2. Control unit will activate alarm LED, alarm and horn relay, LCD display, and buzzer will sound.
3. The LCD will display an alphanumeric readout of zone, type alarm, date, time and I. D. or location.
4. Upon operation of the reset switch the relays shall return to normal state. The Control Unit LED and LCD will be reset to normal state if the cause of the alarm has been cleared.

D. Subsequent ALARMS and FAULT

1. Subsequent alarms and faults shall be initiated and will annunciate on control unit activating the alarm and horn relays, LCD display and alarm buzzer.

2.08 WARRRANTY

A. Control Unit(s) described herein shall be warranted for a period of not less that two (2) years against defects in workmanship and materials.

B. Detector described herein shall be warranted for a period of not less that three (3) years against detects in workmanship and materials.

PLEASE NOTE: For more information please contact Information Services – 225-751-1200

EPC-50/32 CONTROL UNIT TECHNICAL DATA

Number of Inputs (Zones):
1 - 32 direct wire, using the EPC-I16 or EPC-I32 Input Board (The EPC-I16 and I32 provide 16 and 32 zones or inputs respectively)

Type Inputs:
Control shall be capable of monitoring HTI manufactured or approved normally open, thermister, process variable inputs, and other devices or sensors

Keypad:
Operator control, programming, inquiry and Keypad lock feature

Alarm Indicators:
Common *ALARM*, *FAULT*, and *POWER* Light Emitting Diodes

LCD alphanumeric display (2 line x 16 character) for all conditions including alarm ID, location, time & date (Each zone subsequently annunciated when in ALARM or FAULT and displayed in chronological order)

ALARM / FAULT Audible Alarm (90db w/enclosure open)

Outputs:
Common Form C Relays - *ALARM*, *FAULT*, and *HORN*, rated at 10 amps - switches devices up to 24V

RS-232 channel for logging printer, BMS, computer interface or external modem

LED and/or by zone Form C output relays, rated at 10 amps, corresponding to each zone/input when using optional EPC-RIB Relay Interface Board(s)

Sensitivity:
Each zone/input shall be adjustable for sensitivity or hi-lo alarm set points

Supervision:
Each zone shall be independently supervised and annunciated giving location when *FAULT* or *ALARM* conditions occur. Continuous LED indication for detector continuity check. **Continuous LCD readout of system status, date and time.**

Current Consumption:
No greater than .25 amps

Supply Voltage:
110/12VAC, 20VA - outboard UL listed transformer power supply (EPC-TR)

Rectifier:
Short circuit proof, current limiting, over heat protection 12VDC, unregulated output @ .2 Amps for auxiliary device (strobe, relay, etc.)

Back-up Batteries:
1 each 12V, 12Ah, - 24 hours

Cabinet/Enclosure:
Heavy gauge steel, type NEMA 12, with hinged door and key lock, 14" H, 12" W, 4" D
Color: Light desert sand with gold on black membrane faceplate

Cabinet Mounting:
Surface or Semi-flush (Semi-flush requires EPC-FM mounting bracket)

Meets National Electrical Codes for Class II Devices
Power Supply - UL Listed

***HYDRO*-TEMP Inc.**

EPC-50/32 CONTROL UNIT TECHNICAL MANUAL
TABLE OF CONTENTS

I. Installation

A. Control Unit Installation

1. The *EWA SYSTEM* EPC-50/32 Control Unit should be installed where it will be easily accessible and clearly visible to the owner's personnel with the LCD at eye level. It should also be located in a protected environment. DO NOT install the control unit where it will be subject to corrosive agents, may get wet, or where the temperature goes below 32 degrees F (0 degrees C) or above 104 degrees F (40 degrees C). The EPC-50/32 Control Unit is made for surface mounting but can be mounted semi-flush with the optional EPC-FM trim kit. Fasten the control unit to the mounting surface with suitable fastening devices. Do not mount directly to concrete or masonry walls without a 1/2" - 3/4" plywood spacer.

   A good "earth" ground must be provided to the ground terminal. If a cold water pipe ground is not available an electrical ground may be used. The electrical ground must be checked to verify a good ground. There are commercially available testers that will indicate the "ground" status.

2. CAUTION: The EPC-50/32 Control Unit contains sensitive components. The following guidelines should be followed:

   a. Do not remove circuit board(s) from cabinet unless absolutely necessary. If you must remove the circuit boards, handle them by the edges only. If a circuit board must be transported or shipped, it must be enclosed in a static shielding plastic bag.

   b. Do not plug or unplug the EPC-116/32 input board with AC or battery power applied. Remove all sources of power first, then plug or unplug the input board. **Improper circuit board handling or failure to provide a proper "earth" ground may cause damage or improper operation and will result in voided warranty.**

   c. *ALARM, FAULT* and *HORN* relays may be used to switch up to 24 VOLTS. High voltages will damage the circuitry.

3. Wiring in the control unit should be neatly organized and carefully labeled to aid troubleshooting and repair. Refer to DRAWING EPC-1 for location and identification of terminals and as a typical connection diagram. All field wiring should be connected to the EPC-50/32 Control Unit before applying power. The correct power up sequence is to connect the 12VAC power first then add the battery. **Battery polarity must be observed!** *NOTE*: The time/date must be reset after power is connected to the control unit. (Even if the time and date are correct you must step through the "Time" set menu or process.) The "FAULT" lamp stays dimly lit at all times.

4. Terminal Description (Main Board EPC-MB): See DRAWING EPC-1

   Terminal 1. - 12 VAC input
   Terminal 2. - 12 VAC input
   Terminal 3. - Ground input
   Terminal 4. - 12 VDC unregulated output 200ma. max.
   Terminal 5. - Positive 12V battery input
   Terminal 6. - Negative 12V battery input
   Terminal 7. - Relay interface output
   Terminal 8. - Relay interface ground
   Terminal 9. - Printer/modem RS232 output
   Terminal 10. - Printer/modem RS232 input
   Terminal 11. - Printer/modem RS232 carrier detect input
   Terminal 12. - Printer/modem RS232 ground
   Terminal 13. - Not Used
   Terminal 14. - Not Used
   Terminal 15 - Not Used
   Terminal 16. - Not Used
   Terminal 17. - Chassis ground
   Terminal 18. - Alarm relay common
   Terminal 19. - Alarm relay normally open
   Terminal 20. - Alarm relay normally closed
   Terminal 21. - Fault relay common
   Terminal 22. - Fault relay normally open
   Terminal 23 - Fault relay normally closed
   Terminal 24. - Horn relay common
   Terminal 25. - Horn relay normally open
   Terminal 26. - Horn relay normally closed
   Terminal 27. - Not Used
   Terminal 28. - Not Used

B. Input Board Installation

1. The EPC-50/32 Control Unit will accept either an EPC-116 (16 zone input board) or EPC-132 (32 zone input board). The following installation procedure applies to both input boards. (Refer to Drawing EPC-1)

   a. Remove both AC and battery power from the control unit. Using the four furnished screws, attach the EPC-116/32 input board to the back of the control unit with the terminal strip(s) on the bottom and the right side of the input board (only the EPC-132 board will have terminal strips on the right side).
   b. Attach the furnished ribbon cable to the EPC-50/32 Control Unit. NOTE: Ribbon cable must be installed with red lead pointing <u>down</u> on EPC-MB connector and red lead pointing <u>down</u> on EPC-116/32 input board.
   c. Connect the furnished ground wire from "GND" terminal on EPC116/32 to the cabinet ground terminal.

   d. Reconnect AC and battery power to control unit.

e. All direct wired inputs terminate on the indicated terminals of the input boards. Shields on zone wires should only terminate on the "C" terminal along with one zone wire. The other zone wire terminates on the indicated zone terminal. Use UL approved 100% aluminum foil mylar shielded, 2 conductor, 22 gauge, insulated (stranded) wire or multi-paired cable as necessary.

C. Relay Interface Installation (EPC-RI8 and RI8X)

1. The EPC-50/32 Control Unit has a 300 baud RS232 output for connection to the EPC-RI8 Primary Relay Interface board. This board provides up to 8 form "C" relay outputs and drives up to 3 EPC-RI8X Relay Interface Expander boards, each driving 8 form "C" relay outputs to a maximum of 32 outputs. **Relays may be used to switch up to 24 volts @ 10 amps. Higher voltages will damage the circuitry.**

2. The relay interface modules are designed to be mounted external to the EPC-50/32 Control Unit. They measure 5" X 9" X 1". Power for the modules may be provided by the EPC-TR transformer that supplies the control unit if modules are located next to the control unit. If modules are located farther than 40 feet from the control unit a dedicated EPC-TR transformer will be required. **Relay modules will not operate upon loss of commercial power.**

3. Terminal description (Relay Interface EPC-RI8 and RI8X) See DRAWING EPC-1

EPC-RI8 Primary Relay Interface	EPC-RI8X Relay Interface Expander
Terminal 1. - 12 VAC input	Terminal 1. - 12 VAC
Terminal 2. - 12 VAC input	Terminal 2. - 12 VAC
Terminal 3. - +5 VDC power out to EPC-RI8X	Terminal 3. - +5 VDC power in from EPC-RI8
Terminal 4. - Ground power out to EPC- RI8X	Terminal 4. - Ground power in from EPC-RI8
Terminal 5. - Relay interface in	Terminal 5. - Not used
Terminal 6. - Relay interface in ground	Terminal 6. - Not used
Terminal 7. - Strobe output to EPC-RI8X	Terminal 7. - Strobe input from EPC-RI8
Terminal 8. - Not used	Terminal 8. - Data input from EPC-RI8 or previous EPC- RI8X
Terminal 9. - Clock output to EPC-RI8X	Terminal 9. - Clock input from EPC-RI8
Terminal 10. - Data output to EPC-RI8X	Terminal 10. - Data output to next EPC-RI8

D. Peripheral Device Installation

1. The EPC-50/32 Control unit has a 300 baud RS232 output which may be configured for a local serial printer, an output to a building management system or connection to an external modem. The local serial printer and output to a building management system connections are the same. The printer should be an 80-column printer and should be set to recognize 300 baud, 8 bit, no parity, 1 stop bit data format. Refer to DRAWING EPC-1 for location, identification of terminals and a typical connection diagram for a serial printer

2. The external modem should be a 300-baud modem that recognizes the "AT" command set. Refer to the "Programming" section of the manual for instructions on entering the dialing sequence. Refer to DRAWING EPC-1 for location, identification of terminals for modem connection.

II. Operation and Programming - EPC-50/32 Control Unit

A. Common Relay Outputs

1. Fault relay will de-energize at loss of AC power or a zone fault condition. Upon restoration of fault condition the relay will automatically reset.

2. Alarm relay will energize upon a zone ALARM condition and can only be reset after the alarm condition is corrected and control reset.

3. Horn relay will energize upon any fault or alarm condition. Horn may be silenced by pressing the keypad "SILENCE" button and will reactivate upon any subsequent fault or alarm.

B. LCD Display and Keypad

1. The LCD display is a 16 character by 2 line alpha-numeric display. The display will show all alarms, system status and programming prompts. When no ALARM or FAULT condition(s) exist, the LCD display will indicate the following: (time is displayed in 24-hour format)
   SELECT LINE
   HH:MM MM/DD/YY

2. The 4-button keypad is used to acknowledge alarms and program system parameters. The keypad is initially locked upon power up allowing access to a limited menu. The keypad will automatically "LOCK" if not used for 15 minutes. To unlock the keypad press the following keys in the sequence indicated: ESCAPE, ENTER, ARROW UP, ARROW DOWN, ESCAPE

3. The arrow up, arrow down keys are used to scroll through command lines and input variables. The ENTER key is used to select currently displayed commands and variables. The ENTER key is also used to reset an alarm condition, once that condition has been corrected. The ESCAPE key is used to exit from current menu and to silence the horn.

C. Operator Commands

1. The following commands are available from the "SELECT LINE" prompt. Press the arrow up or arrow down key to view commands and the "ENTER" key to execute the command on the display.

"00 VIEW ALARMS" - Used to scroll through alarms and faults in chronological order and/or allows reset of zone alarm relay when zone alarm condition has cleared.
"01 INPUT VALUES" - Allows viewing of current value of each input zone.
"02 TIME" - Used to view and set time and date.
"03 SET LIMITS" - Programs alarm and fault limits, calibrations and type of input.
"04 SET I.D" - Programs alphanumeric display for each zone.
"05 PHONE #" - Programs modem telephone number.
"06 LOCK?KBD" - Locks keyboard (allows only 00 View Alarms and 01 Input Values).

D. Command Descriptions and Programming

1. The "VIEW ALARMS" command will present all alarm and fault conditions in chronological order. To view alarms select the "VIEW ALARMS" command line and press "ENTER" Key. The arrow up and arrow down keys will scroll through ALARM or FAULT conditions indicating the zone, time and date of alarm. If the "ENTER" (RESET) key is pressed the zone will reset if the alarm/fault condition has been cleared and display "NOW RESET". If alarm is not cleared the display will indicate "IN ALARM". If all alarms are cleared and "ENTER" (RESET) key is pressed the display will indicate "CLEAR" and return to "SELECT LINE" prompt. The "ESCAPE" key will also return to the "SELECT LINE" prompt.

2. The "INPUT VALUES" command will allow you to select a zone and view the raw data value. To view input values select the "INPUT VALUES" command line and press "ENTER" key. The arrow up and arrow down keys will scroll through the range of zones. Press the "ENTER" key when the zone to view is in the display. After approximately 5 seconds the raw data value will be displayed. The display will clear and return to the "SELECT LINE" prompt. The "ESCAPE" key will also return to the "SELECT LINE" prompt.

3. The "TIME" command is used to reset the time/date and clear backup data memory. This command must be performed after power is removed and reapplied to the control unit. The arrow up and arrow down keys are used to scroll through the range of values. Press the "ENTER" key when the value to enter is in the display. The following sequence should be used to correctly set time and date:

   a. Select "TIME" command line and press "ENTER" key. Current time will be displayed. To change time press arrow up or arrow down key. To skip to date press "ENTER" key. If change time was selected, the current hour will be displayed. Use the arrow up or arrow down key to change hour display (24 hour format) and press "ENTER". Then the current minute will be displayed. Use the arrow up or arrow down key to change minute display and press "ENTER".

   b. Current "DATE" and "DAY" will then be displayed. To change "DATE" and "DAY" press "ENTER" key. To return to "SELECT LINE" prompt press "ESCAPE" key. If change date/day was selected, the current weekday will be displayed. Use the arrow up and arrow down key to change weekday display (1- Sunday, 2-Monday, etc . . 7-Saturday) and press "ENTER" key. Then the current day will be displayed. Use the arrow up and arrow down key to change day display and press "ENTER" key. Then the current month will be displayed. Use the arrow up and arrow down key to change month display and press "ENTER" key. Then the current year will be displayed. Use the arrow up and arrow down key to change year display and press "ENTER" key. The display will then revert back to current date and day, to return to "SELECT LINE" prompt press "ESCAPE" key.

4. The "SET LIMITS" command is used to program the operational characteristics of each zone.

   a. The EPC-116/32 input boards are addressed as zones 1-16 or 1-32 respectively. To set limits for the zones select "SET LIMITS" command line and press "ENTER" key. When setting limits you will first be prompted to select the zone. Use the arrow up and arrow down keys to change zone display and press "ENTER" key.

   b. After a zone has been selected the next prompt will be "LOW LIMITS". This is the value for which an alarm will be generated on a specific zone. Use the arrow up and arrow down key to change value and press "ENTER" key. The following chart will help determine setting for leak detection zones. NOTE: *To deactivate a zone, program "00" as high limit, low limit and calibrate values.*

<u>Sensitivity Level</u> <u>Range</u>

low	110-117
medium	118-122
high	123-127

The most accurate method used to select the sensitivity level (LOW LIMITS) is to determine how many drops of liquid should cause an "ALARM". Usually 8-10 drops are appropriate. Next, drop that amount of liquid on the detector and view the reading in "VIEW VALUES". This reading will be the alarm set point value which you will input in "SET LIMITS". The set points for temperature and humidity detectors are the actual temperature or humidity values that the user chooses to generate an alarm.

c. The next prompt will be for the "HIGH LIMITS". This is the value for which a fault alarm will be generated on a leak detector zone. With a 15k ohm end of line resistor this value should be set at 160. Use the arrow up and arrow down key to change value.

d. The next prompt will be for "CALIBRATE". This is the value for offset calibration for temperature and humidity sensors to correct the differential between actual value (temperature or humidity) and the value given by the sensor. Use the arrow up and arrow down key to change value then press "ENTER" key when desired value is displayed.

e. The next prompt will be for "TYPE" of zone input. Use the arrow up and arrow down key to select "TYPE" then press "ENTER" key. The following chart describes the type zones:

Type	Low Limit	High Limit
Hydro (leak detector)	alarm	fault
Temp (temperature)	alarm	alarm
Humid (humidity)	alarm	alarm

f. The "ALARM TIME" will then be displayed for this zone. This is the last time the zone went into alarm.

g. Press the "ENTER" key and then you may change limits on another zone or press "ESCAPE" to return to the "SELECT LINE" prompt.

5. The "SET I.D." command allows you to program a 16 character description for each zone. To set the I.D. for the zones select "SET I.D." command line and press "ENTER" key.

a. When setting the I.D., you will first be prompted to select the zone. Use the arrow up and arrow down keys to change zone display and press "ENTER". After a zone has been selected, the display will display the current I.D. on the bottom line. The current character of the first position of the I.D. is displayed at the end of the top line. Use the arrow up and arrow down keys to change display as needed and press the "ENTER" key. Then the next character will be displayed at the end of the top line. Continue until all 16 characters are entered. If you make a mistake, press "ENTER" until the character you want to change appears at the end of the top line. Correct the character, then proceed or press "ESCAPE" to exit.

b. After each zone I.D. is set you will be prompted to set another zone. If you do not wish to set another zone press "ESCAPE" key to return to the "SELECT LINE" prompt.

6. The "PHONE #" command allows you to program a telephone number string, up to 11 digits, that will be output to an external "AT" compatible modem. NOTE: Make sure that all digits are "0" if this feature is not used!

a. To set the telephone number for the modem, select "PHONE #" command line and press "ENTER" key. The current telephone number will be displayed. Use the arrow up and arrow down keys to change the first digit and press "ENTER" key. Continue until all 11 digits are entered. If you make a mistake use the "ESCAPE" key to exit and start over. After the last digit is set, the display will return to the "SELECT LINE" prompt. (NOTE : To disable modem operation, reprogram modem telephone numbers to all zeros.)

7. The "LOCK?KBD" command allows you to control access to the programmable features of the control unit. If there has been no keyboard activity for 15 minutes, (with the exception of "VIEW ALARMS" and "INPUT VALUES"), the keypad will automatically lock up in order to avoid tampering. When the keyboard is locked the only command lines that are available are "VIEW ALARMS" and "INPUT VALUES". This will only allow the viewing of alarms and faults, reset of alarms and viewing input values.

a. To manually lock the keyboard select "LOCK?KBD" command line and press "ENTER" key.

III. System Inspection and Maintenance

A. Inspection

When the installation is completed, create appropriate "ALARM" and "FAULT" conditions on each detector loop in the system. Note: As "ALARM" and "FAULT" conditions are created on the individual detection loops, the installer should pay particular attention to the correct zone labeling. A set of drawings showing the location of each detector and its corresponding loop or "zone" number should be left with the owner.

1. Cause a temperature or humidity detector alarm by changing the settings until they pass the ambient conditions. After the check is made, reset them to the correct settings.

2. Place several drops of water on each tape zone to produce an alarm. The subsequent alarm condition should correct itself after that section of the tape has been allowed to dry about 15 minutes.

3. Liquid Level and Spot Detectors can be checked by using a small cup of water to produce an "ALARM" condition across the detector probes.

4. Check the "FAULT" function by temporarily disconnecting a wire connecting each of the make type detectors. The easiest method is to disconnect one input wire, at the control unit, for each of these type zones.

5. A complete final inspection will ensure a properly functioning *EWA System*. This technical manual should be left with the owner. It contains important information on the system's components and functions. Additional copies are available upon request from Hydro-Temp, Inc.

B. Maintenance

The system should be re-inspection (tested) no later than 6 months after installation. The inspection procedure described in 1. above, and other related manuals, should be followed. In addition, the system should be visually inspected monthly for problems that may have occurred since installation. The system should then be thoroughly inspected every 3 months including by zone inspection and test. The batteries should also be tested under load at this time.

IV. Warranty

Unless specifically provided in this statement, there are no applicable warranties - expressed or implied - except the expressed warranty of Hydro-Temp, Inc. in effect at the time of shipment. Liability is strictly limited to repair or replacement of the item(s) covered under the terms of this warranty.

All products are guaranteed from defects of materials and workmanship as follows:

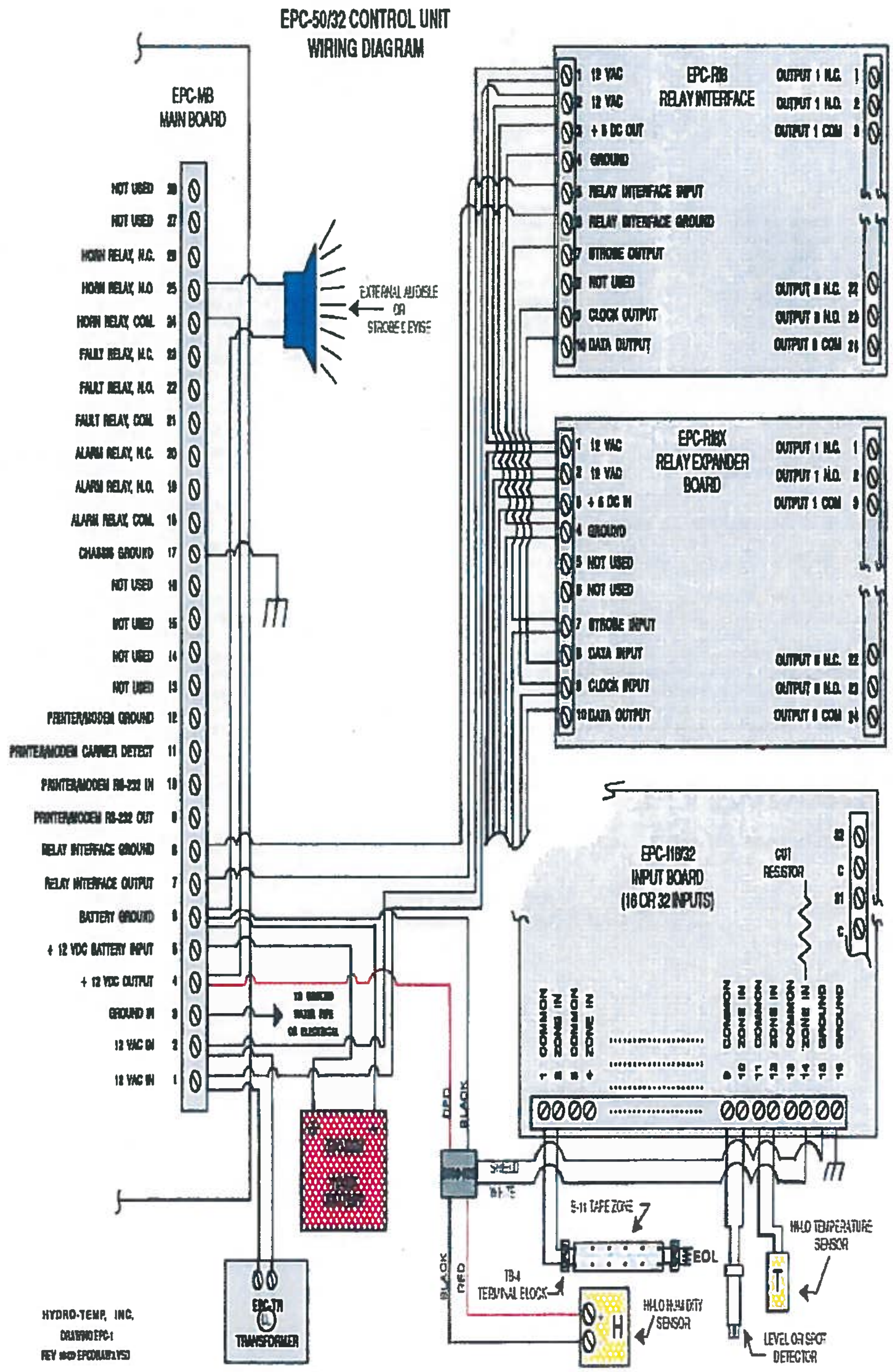
EPC-50/32 Control Units - 24 Months from the date of original purchase. Detectors - 36 months from the date of original purchase. All other products, sold by Hydro-Temp, Inc., for use in connection with the installation or operation of the EWA System Control Units - 12 months from the date of original purchase.

Hydro-Temp, Inc. retains the option of either repairing a defective unit or part, or replacing it with a new unit or part, after such defective unit or part has been returned to Hydro-Temp, Inc. This warranty is void if any equipment sold is abused or damaged or if equipment is not used or installed in accordance with Hydro-Temp, Inc. specifications and installation instructions.

Defective units or parts being returned during the applicable warranty period should be packaged so as to ensure safe delivery to Hydro-Temp, Inc. Owner shall pay shipping cost of returning a detective unit or part and shall not be entitled to reimbursement for the costs of dismantling a defective unit, part nor reinstallation thereof.

The Hydro-Temp, Inc. invoice number, under which the item was sold along with a complete description of problem(s) being experienced with the equipment, must accompany returns described above. For additional assistance with warranty service or any questions related to Hydro-Temp, Inc.'s products, please call (225) 751-1200 or your local dealer.

DISCLAIMER: Hydro-Temp, Inc. makes no representations or warranties with respect to the materials and workmanship described herein and specifically disclaims any implied warranties of merchantability, or fitness for a particular purpose. Hydro-Temp, Inc. shall have no liability for loss or damage, caused or alleged to be caused, direct or indirect, special or reliance, by the equipment purchased, including but not limited to any interruption of service, loss of business or anticipatory profits or consequential damages resulting from the use of this equipment. The user shall test the equipment to determine if the operation of the equipment is suitable for the task designated by the user. Hydro-Temp, Inc. reserves the right to make changes at any time without notice. This paragraph shall survive failure of an exclusive remedy.



EPC-50/32 CONTROL UNIT
WIRING DIAGRAM
EPC-MB
MAIN BOARD
NOT USED
NOT USED
HORN RELAY, N.C.
HORN RELAY, N.O.
HORN RELAY, COM.
FAULT RELAY, N.C.
FAULT RELAY, N.O.
FAULT RELAY, COM.
ALARM RELAY, N.C.
ALARM RELAY, N.O.
ALARM RELAY, COM.
CHASSIS GROUND
NOT USED
NOT USED
NOT USED
NOT USED
PRINTER/MODEM GROUND
PRINTER/MODEM CARRIER DETECT
PRINTER/MODEM RS-232 IN
PRINTER/MODEM RS-232 OUT
RELAY INTERFACE GROUND
RELAY INTERFACE OUTPUT
BATTERY GROUND
+ 12 VDC BATTERY INPUT
+ 12 VDC OUTPUT
GROUND IN
12 VAC IN
12 VAC IN
EXTERNAL AUDIBLE
OR
STROBE DEVICE
EPC-RI8
RELAY INTERFACE
12 VAC
12 VAC
+ 5 DC OUT
GROUND
RELAY INTERFACE INPUT
RELAY INTERFACE GROUND
STROBE OUTPUT
NOT USED
CLOCK OUTPUT
DATA OUTPUT
OUTPUT 1 N.C.
OUTPUT 1 N.O.
OUTPUT 1 COM
OUTPUT 8 N.C.
OUTPUT 8 N.O.
OUTPUT 8 COM
EPC-RI8X
RELAY EXPANDER
BOARD
12 VAC
12 VAC
+ 5 DC IN
GROUND
NOT USED
NOT USED
STROBE INPUT
DATA INPUT
CLOCK INPUT
DATA OUTPUT
EPC-I16/32
INPUT BOARD
(16 OR 32 INPUTS)
CUT
RESISTOR
COMMON
ZONE IN
COMMON
ZONE IN
GROUND
RED
BLACK
SHIELD
WHITE
S-11 TAPE ZONE
EOL
TB-4
TERMINAL BLOCK
HI-LO HUMIDITY
SENSOR
HI-LO TEMPERATURE
SENSOR
LEVEL OR SPOT
DETECTOR
EPC-TR
TRANSFORMER
HYDRO-TEMP, INC.

13137

HYDRO-TEMP™

The EWA* Water Leak Detection

& Environmental Monitoring System *Early Warning Alarm

The HYDRO-*Temp* brand, EWA (Early Warning Alarm) Leak Detection System, is one of the most unique and effective early warning systems used for detecting and annunciating water and other aqueous liquid leaks and environment conditions ***In order to prevent a disaster.***

Early warning of environmental conditions is crucial for the protection of critical facilities and equipment from damage due to water leaks (moisture) and/or temperature and humidity extremes. Damage that result from leaking or sweating pipes, clogged drains, ruptured storage tanks, temperature or humidity extremes can be disastrous. Statistics show that more insurance claims are filed because of water damage than from any other source. These claims include backed up sewer and drain lines, coolant lines, broken water lines, sprinkler discharges, roof leaks and almost any other sources of water. The EWA System early warning water detection alarms, prevent the DISASTER.

Let The EWA System meet your application needs

Because the potential for these problems and the accompanying losses are so great, business, industry and asset conscious concerns are turning to the HYDRO-*Temp* EWA System for protection to secure their valuable assets.

The EWA System is a complete stand-a-lone system and features Lineal Leak Detectors, Spot Detectors, Temperature Sensors and Humidity Sensors, with any combination of which may be monitored using a single control unit. Our EPC microprocessor based control features 1-32 zones/inputs. Each zone/input monitors conditions in a specified area and may be individually programmed based upon the conditions for that specific area. So, any combination of detectors may be used with one common EPC series control unit.

The best news about the EWA System is that of economy. The HYDRO-*Temp* water leak detection system, used WORLD WIDE SINCE 1971, is more economical and reliable than most quality detection systems of its type. This system outlasts most of the facilities in which it is used.

The EWA System virtually eliminates nuisance alarms and other problems common to alarm type systems. The most common problem with so many competitive brands is the false alarm. The EWA System takes the aggravation of unwanted alarms out of the equation. Our zoned water leak detection systems allow for programming each zone/input, taking into consideration the ambient condition of each detection area, assures proper adjustment of the set points for annunciation actual conditions. Each zone/input is independent of all others and therefore the condition for each zone may be considered and set points values input without affecting other zones set points. This feature also allows for a high degree of redundancy which is essential to properly protect critical facilities.

The EWA System is used by local, state and federal government institutions, all military branches, private, commercial and industrial concerns (see our USERS and APPLICATIONS pages).

Contact HYDRO-*Temp* today for more information about our water alarm systems.

OUR COMMITMENT SINCE 1971
QUALITY • FLEXIBILITY • RELIABILITY • SATISFACTION

HYDRO-TEMP™

System Control Unit

EPC-50/32 Control Unit

WATER LEAK DETECTION AND ANNUNCIATION

When Considering Water (Aqueous) Alarms or Water Leak Detection Systems, Consider the EPC Series Control Unit Featuring The Following:

- Early Warning Annunciation
- Water Alarm Monitoring
- Lineal Leak Detection
- Liquid Leak Detection
- Other Sensor Monitoring
- Water Leak Detection
- Spot Leak Detection
- Water Level Detection
- Water Level Sensor Monitoring

Monitoring for water leaks (aqueous liquids) and other environment conditions is critical to the protection of moisture sensitive facilities. The damage that results from leaking or sweating pipes, clogged drains, ruptured storage tanks, or water and sewerage mains could be devastating. The EPC series control unit is a microprocessor based water leak detection system. This leak detection system is a reliable, user friendly, programmable, stand alone system, and includes battery back-up. It is specifically designed to provide liquid leak detection and early warning due to a leak or water alarm conditions. The water leak detectors (or aqueous liquid leak detectors) are designed to allow the earliest alarm indication in order to avoid costly damage and downtime. The EPC series control, combined with our durable water leak detection components, provides liquid leak detection and protection against the dangers that most critical facilities face on a daily basis. Early warning for leak detection is the key to assets protection. Early warning prevents the disaster.

A Summary of Features and Capabilities

1. Micro-Processor Based Control

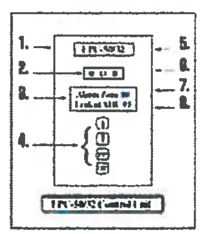
- Monitors 1-32 Zones/Inputs
- Monitors each zone independently
- Provides subsequent alarming, no matter how many zones go into ALARM or FAULT
- Identifies location, time & date of all ALARM and FAULT conditions

2. LED Status Indicators

- ALARM, FAULT, POWER FAULT

3. LCD Display - Alphanumeric

- ALARM and FAULT Location, ID, time, date, and type alarm (temp, humid, hydro (water) etc
- Input values (current temp or humidity, hydrohms, etc., of specific zones or input sensors)
- Alarms in chronological order
- Zone/Input specific program information review



4. Keypad Operation

- Field programmable
- Zone specific programming - type input, alphanumeric ID, alarm set points, etc
- Includes lockout feature to prevent tampering
- Software program, user data and last alarm per zone / input, retained at power loss

5. Input Boards

- 1-32 independently wired inputs / zone (identified as zones 1-32)
- Independent zoning allows for a higher level of redundant protection and site customization - meet the needs of user

6. Calendar Clock

- Automatically adjusts for daylight savings time

7. Zoned Water Leak Detection Systems - Multiple Device Monitoring

- Leak detection of aqueous liquids (even de-ionized water)
- Lineal leak detection tape
- Spot detectors
- Level detectors (sumps, drains, pans, etc.)
- Temperature and Humidity Sensors (electronic)
- Other detectors may also be used

HYDRO-TEMP™

Lineal Liquid Leak-Detector

B-11 Liquid Detector Tape

The lineal leak water detector tape design allows encirclement of equipment or potential sources of leaks A warning will sound when as few as 2 drops (adjustable) of water (aqueous liquid) comes in contact with the tape This is in stark contrast to spot detector systems that trigger the alarm if and when water hits the contact points Early detection of leaks allows for corrective action to be implemented immediately, rather than after the flood has occurred The tape is glued or strapped to the surface to be protected (floor, pipes, etc) avoiding migration and bridging Bridging allows water to flow under the cable and thus, avoid detection The low profile of the B-11 helps to prevent damage as opposed to the higher profile cable used in some systems which can be easily snagged, dragged and/or damaged

Liquid Detector Tape - Floor or Sub Floor Application

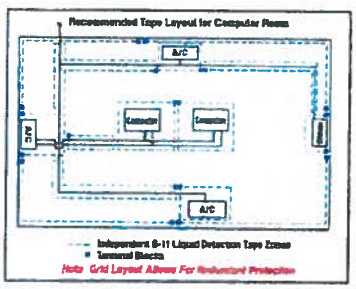
Redundancy through multiple zoning.

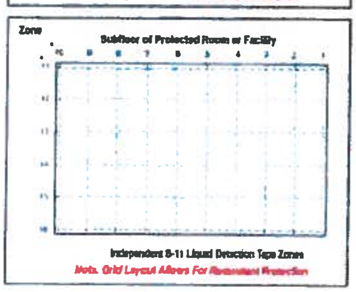
When the liquid leak detector tape is properly applied, potential sources of water leakage are completely surrounded The many "zones" that are formed serve to confine the area of detection and provide added or redundant zones of protection These small zones serve to pinpoint the location of the leak Unlike cable detection systems that use the "unizone" method and are incapable of monitoring other zones when there is an active alarm, the EWA System provides multiple supervised protective loops This allows for the ability to continue detection and warning, even when there is an active Alarm or Fault in other zones or sensors

Liquid Detector Tape - Horizontal Pipe Application

Detector Wires:
Non-ferrous (non-magnetic), type 304 stainless steel, 22 gauge
Carrier Material:
Specially woven for proper wicking or capillary action
Construction:
Two stainless steel detection wires inserted into carrier/tape with 7/16" (11 1mm) spacing for nuisance alarm prevention
Dimensions:
Width: 1 1/8" (28 6mm),
Length/Roll 250 feet (76 2m)
Length/Zone:
Usually applied in lengths of 100 feet (30 5m) or less per zone Maximum allowable length per zone - 2000 feet (609 6m)

Liquid Detector Tape - Vertical Pipe Application





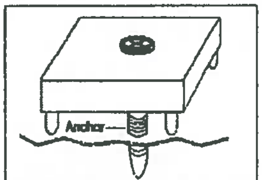
HYDRO-TEMP™

Spot & Level Detectors

N-2F Spot Detector

This water detector is specially designed for direct floor mounting It sends an alarm signal indicating the presence of water or other aqueous liquids It is applied in critical areas such as computer rooms, equipment rooms, basements, inside equipment, or drip pans, etc

Spot Detector



N-2F Floor Mountable Spot Detector

Detectors:
Three heavy-duty water detector probes, type 302 stainless steel, 1/4" (6 4mm) diameter Liquid need only contact two detector probes for alarm

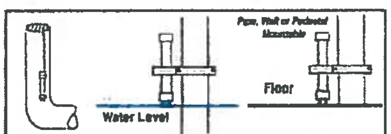
Construction:
Three each stainless steel detector probes extending from a waterproof ABS plastic case, which is potted and includes internal end-of line resistor and 6 foot, 2 conductor, 22 gauge pigtail

Dimensions:
Height 3/4"(19 1mm), Length 3" (76 2mm), Width 2" (50 8mm)

N-2 Level/Spot Detector

Used with EWA System control unit, the N-2 liquid leak detector causes the unit to issue an alarm when an aqueous liquid, such as water, reaches a predetermined level/point It is used in certain applications to detect the intrusion of water into a basement, drains, or sump areas, etc

Level/Spot Detector



N 2: Typical Applications

Detector Wires:
Two heavy duty detection probes, type 302 stainless steel, 1/4" (6.4mm) diameter

Construction:
Two each, heavy duty stainless steel liquid leak detector probes mounted in end cap of CPVC waterproof housing Unit includes internal end-of-line resistor and 6 foot, 2 conductor, 22 gauge pigtail Furnished with mounting clamp

Dimensions:
Length: 5" (127mm),
Diameter (without mounting clamp) 1 1/8" (28 6mm)

Contact HYDRO-Temp today for more information about our leak detection cable and water detector equipment

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QUALITY • FLEXIBILITY • RELIABILITY • SATISFACTION

ENCLOSURE 3

Geomembrane Lifetime Prediction,
Geosynthetic Institute White Paper #6

ENV-DO-15-0137

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Date: MAY 2 0 2015

: 13144

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GRI White Paper #6

- on -

Geomembrane Lifetime Prediction:
Unexposed and Exposed Conditions

by

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Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions

1.0 Introduction

Without any hesitation the most frequently asked question we have had over the past thirty years' is "how long will a particular geomembrane last".* The two-part answer to the question, largely depends on whether the geomembrane is covered in a timely manner or left exposed to the site-specific environment. Before starting, however, recognize that the answer to either covered or exposed geomembrane lifetime prediction is neither easy, nor quick, to obtain. Further complicating the answer is the fact that all geomembranes are formulated materials consisting of (at the minimum), (i) the resin from which the name derives, (ii) carbon black or colorants, (iii) short-term processing stabilizers, and (iv) long-term antioxidants. If the formulation changes (particularly the additives), the predicted lifetime will also change. See Table 1 for the most common types of geomembranes and their approximate formulations.

Table 1 - Types of commonly used geomembranes and their approximate formulations (based on weight percentage)

Type	Resin	Plasticizer	Fillers	Carbon Black	Additives
HDPE	95-98	0	0	2-3	0.25-1
LLDPE	94-96	0	0	2-3	0.25-3
fPP	85-98	0	0-13	2-4	0.25-2
PVC	50-70	25-35	0-10	2-5	2-5
CSPE	40-60	0	40-50	5-10	5-15
EPDM	25-30	0	20-40	20-40	1-5

HDPE = high density polyethylene
LLDPE = linear low density polyethylene
fPP = flexible polypropylene
PVC = polyvinyl chloride (plasticized)
CSPE = chlorsulfonated polyethylene
EPDM = ethylene propylene diene terpolymer

* More recently, the same question has arisen but focused on geotextiles, geogrids, geopipe, turf reinforcement mats, fibers of GCLs, etc. This White Paper, however, is focused completely on geomembranes due to the tremendous time and expense of providing such information for all types of geosynthetics.

The possible variations being obvious, one must also address the degradation mechanisms which might occur. They are as follows accompanied by some generalized commentary.

- Ultraviolet Light - This occurs only when the geosynthetic is exposed; it will be the focus of the second part of this communication.
- Oxidation - This occurs in all polymers and is the major mechanism in polyolefins (polyethylene and polypropylene) under all conditions.
- Ozone - This occurs in all polymers that are exposed to the environment. The site-specific environment is critical in this regard.
- Hydrolysis - This is the primary mechanism in polyesters and polyamides.
- Chemical - Can occur in all polymers and can vary from water (least aggressive) to organic solvents (most aggressive).
- Radioactivity - This is not a factor unless the geomembrane is exposed to radioactive materials of sufficiently high intensity to cause chain scission, e.g., high level radioactive waste materials.
- Biological - This is generally not a factor unless biologically sensitive additives (such as low molecular weight plasticizers) are included in the formulation.
- Stress State – This is a complicating factor which is site-specific and should be appropriately modeled in the incubation process but, for long-term testing, is very difficult and expensive to acheive.
- Temperature - Clearly, the higher the temperature the more rapid the degradation of all of the above mechanisms; temperature is critical to lifetime and furthermore is the key to

time-temperature-superposition which is the basis of the laboratory incubation methods which will be followed.

2.0 Lifetime Prediction: Unexposed Conditions

Lifetime prediction studies at GRI began at Drexel University under U. S. EPA contract from 1991 to 1997 and was continued under GSI consortium funding until ca. 2002. Focus to date has been on HDPE geomembranes placed beneath solid waste landfills due to its common use in this particular challenging application. Incubation of the coupons has been in landfill simulation cells (see Figure 1) maintained at 85, 75, 65 and 55°C. The specific conditions within these cells are oxidation beneath, chemical (water) from above, and the equivalent of 50 m of solid waste mobilizing compressive stress. Results have been forthcoming over the years insofar as three distinct lifetime stages; see Figure 2.

Stage A - Antioxidant Depletion Time

Stage B - Induction Time to the Onset of Degradation

Stage C - Time to Reach 50% Degradation (i.e., the Halflife)

2.1 Stage A - Antioxidant Depletion Time

The dual purposes of antioxidants are to (i) prevent polymer degradation during processing, and (ii) prevent oxidation reactions from taking place during Stage A of service life, respectively. Obviously, there can only be a given amount of antioxidants in any formulation. Once the antioxidants are depleted, additional oxygen diffusing into the geomembrane will begin to attack the polymer chains, leading to subsequent stages as shown in Figure 2. The duration of the antioxidant depletion stage depends on both the type and amount of the various antioxidants, i.e., the precise formulation.

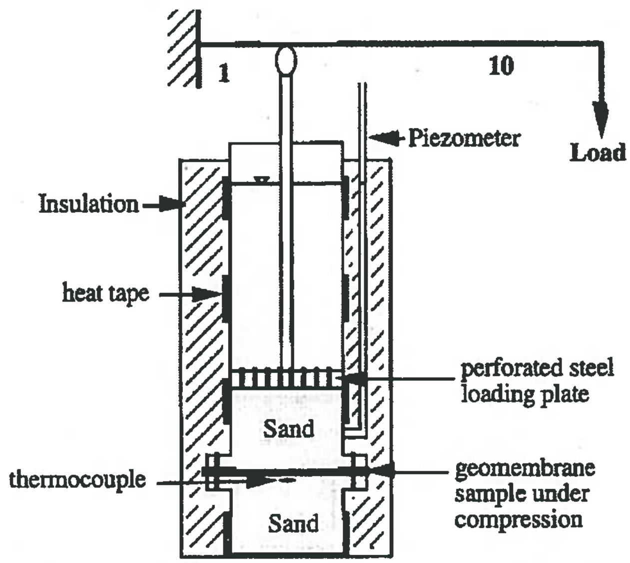


Figure 1. Incubation schematic and photograph of multiple cells maintained at various constant temperatures.

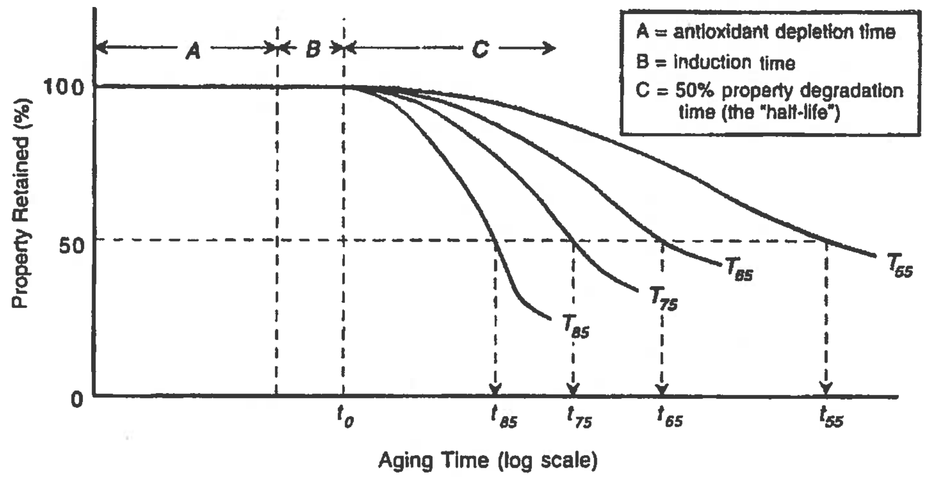


Figure 2. Three individual stages in the aging of most geomembranes.

The depletion of antioxidants is the consequence of two processes: (i) chemical reactions with the oxygen diffusing into the geomembrane, and (ii) physical loss of antioxidants from the geomembrane. The chemical process involves two main functions; the scavenging of free radicals converting them into stable molecules, and the reaction with unstable hydroperoxide (ROOH) forming a more stable substance. Regarding physical loss, the process involves the distribution of antioxidants in the geomembrane and their volatility and extractability to the site-specific environment.

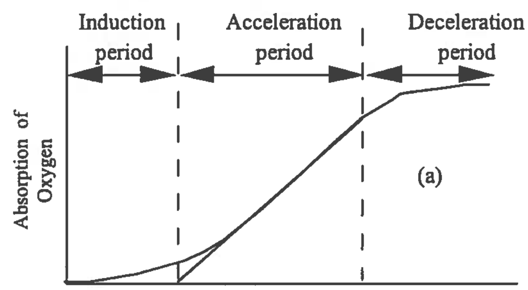
Hence, the rate of depletion of antioxidants is related to the type and amount of antioxidants, the service temperature, and the nature of the site-specific environment. See Hsuan and Koerner (1998) for additional details.

2.2 Stage B - Induction Time to Onset of Degradation

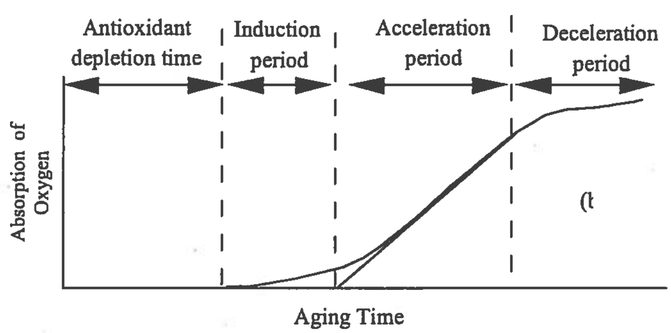
In a pure polyolefin resin, i.e., one without carbon black and antioxidants, oxidation occurs extremely slowly at the beginning, often at an immeasurable rate. Eventually, oxidation occurs more rapidly. The reaction eventually decelerates and once again becomes very slow.

This progression is illustrated by the S-shaped curve of Figure 3(a). The initial portion of the curve (before measurable degradation takes place) is called the induction period (or induction time) of the polymer. In the induction period, the polymer reacts with oxygen forming hydroperoxide (ROOH), as indicated in Equations (1)-(3). However, the amount of ROOH in this stage is very small and the hydroperoxide does not further decompose into other free radicals which inhibits the onset of the acceleration stage.

In a stabilized polymer such as one with antioxidants, the accelerated oxidation stage takes an even longer time to be reached. The antioxidants create an additional depletion time stage prior to the onset of the induction time, as shown in Figure 3(b).



(a) Pure unstabilized polyethylene



(b) Stabilized polyethylene

Figure 3. Curves illustrating various stages of oxidation.

$$RH \rightarrow R\bullet + H\bullet \tag{1}$$

(aided by energy or catalyst residues in the polymer)

$$R\bullet + O2 \rightarrow ROO\bullet \tag{2}$$

$$ROO\bullet + RH \rightarrow ROOH + R\bullet \tag{3}$$

In the above, RH represents the polyethylene polymer chains; and the symbol "•" represents free radicals, which are highly reactive molecules.

2.3 Stage C - Time to Reach 50% Degradation (Halflife)

As oxidation continues, additional ROOH molecules are being formed. Once the concentration of ROOH reaches a critical level, decomposition of ROOH begins, leading to a substantial increase in the amount of free radicals, as indicated in Equations (4) to (6). The additional free radicals rapidly attack other polymer chains, resulting in an accelerated chain reaction, signifying the end of the induction period, Rapopport and Zaikov (1986). This indicates that the concentration of ROOH has a critical control on the duration of the induction period.

$$ROOH \rightarrow RO\bullet\ OH\bullet \text{ (aided by energy)} \tag{4}$$

$$RO\bullet + RH \rightarrow ROH + R\bullet \tag{5}$$

$$OH\bullet + RH \rightarrow H2O + R\bullet \tag{6}$$

A series of oxidation reactions produces a substantial amount of free radical polymer chains (R•), called alkyl radicals, which can proceed to further reactions leading to either cross-linking or chain scission in the polymer. As the degradation of polymer continues, the physical and mechanical properties of the polymer start to change. The most noticeable change in physical properties is the melt index, since it relates to the molecular weight of the polymer. As for mechanical properties, both tensile break stress (strength) and break strain (elongation) decrease.

Ultimately, the degradation becomes so severe that all tensile properties start to change (tear, puncture, burst, etc.) and the engineering performance is jeopardized. This signifies the end of the so-called "service life" of the geomembrane.

Although quite arbitrary, the limit of service life of polymeric materials is often selected as a 50% reduction in a specific design property. This is commonly referred to as the halflife time, or simply the "halflife". It should be noted that even at halflife, the material still exists and can function, albeit at a decreased performance level with a factor-of-safety lower than the initial design value.

2.4 Summary of Lifetime Research-to-Date

Stage A, that of antioxidant depletion for HDPE geomembranes as required in the GRI-GM13 Specification, has been well established by our own research and corroborated by others, e.g., Sangram and Rowe (2004). The GRI data for standard and high pressure Oxidative Induction Time (OIT) is given in Table 2. The values are quite close to one another. Also, as expected, the lifetime is strongly dependent on the service temperature; with the higher the temperature the shorter the lifetime.

Table 2 - Lifetime prediction of HDPE (nonexposed) at various field temperatures

In Service Temperature (°C)	Stage "A" (years)			Stage "B" (years)	Stage "C" (years)	Total Prediction* (years)
	Standard OIT	High Press. OIT	Average OIT			
20	200	215	208	30	208	446
25	135	144	140	25	100	265
30	95	98	97	20	49	166
35	65	67	66	15	25	106
40	45	47	46	10	13	69

*Total = Stage A (average) + Stage B + Stage C

Stage "B", that of induction time, has been obtained by comparing 30-year old polyethylene water and milk containers (containing no long-term antioxidants) with currently produced containers. The data shows that degradation is just beginning to occur as evidenced by slight changes in break strength and elongation, but not in yield strength and elongation. The lifetime for this stage is also given in Table 2.

Stage "C", the time for 50% change of mechanical properties is given in Table 2 as well. The data depends on the activation energy, or slope of the Arrhenius curve, which is very sensitive to material and experimental techniques. The data is from Gedde, et al. (1994) which is typical of the HDPE resin used for gas pipelines and is similar to Martin and Gardner (1983).

Summarizing Stages A, B, and C, it is seen in Table 2 that the halflife of covered HDPE geomembranes (formulated according to the current GRI-GM13 Specification) is estimated to be 449-years at 20°C. This, of course, brings into question the actual temperature for a covered geomembrane such as beneath a solid waste landfill. Figure 4 presents multiple thermocouple monitoring data of a municipal waste landfill liner in Pennsylvania for over 10-years, Koerner and Koerner (2005). Note that for 6-years the temperature was approximately 20°C. At that time and for the subsequent 4-years the temperature increased to approximately 30°C. Thus, the halflife of this geomembrane is predicted to be from 166 to 446 years within this temperature range. The site is still being monitored, see Koerner and Koerner (2005).

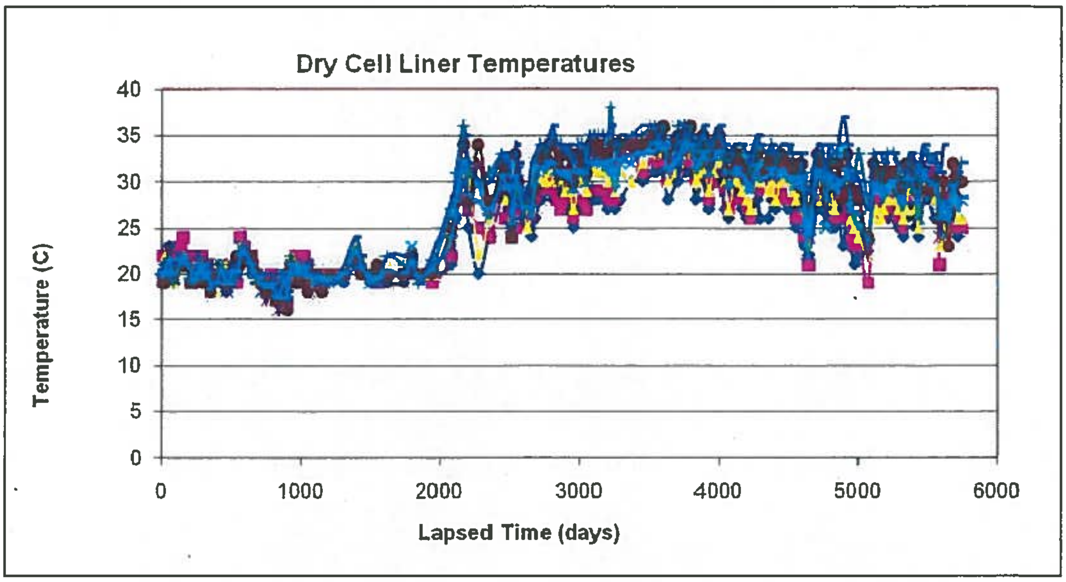


Figure 4. Long-term monitoring of an HDPE liner beneath a municipal solid waste landfill in Pennsylvania.

2.5 Lifetime of Other Covered Geomembranes

By virtue of its widespread use as liners for solid waste landfills, HDPE is by far the widest studied type of geomembrane. Note that in most countries (other than the U.S.), HDPE is the required geomembrane type for solid waste containment. Some commentary on other-than HDPE geomembranes (recall Table 1) follows:

2.5.1 Linear Low Density Polyethylene (LLDPE) geomembranes

The nature of the LLDPE resin and its formulation is very similar to HDPE. The fundamental difference is that LLDPE is a lower density, hence lower crystallinity, than HDPE; e.g., 10% versus 50%. This has the effect of allowing oxygen to diffuse into the polymer structure quicker, and likely decreases Stages A and C. How much is uncertain since no data is available, but it is felt that the lifetime of LLDPE will be somewhat reduced with respect to HDPE.

2.5.2 Plasticizer migration in PVC geomembranes

Since PVC geomembranes necessarily have plasticizers in their formulations so as to provide flexibility, the migration behavior must be addressed for this material. In PVC the plasticizer bonds to the resin and the strength of this bonding versus liquid-to-resin bonding is significant. One of the key parameters of a stable long-lasting plasticizer is its molecular weight. The higher the molecular weight of the plasticizer in a PVC formulation, the more durable will be the material. Conversely, low molecular weight plasticizers have resulted in field failures even under covered conditions. See Miller, et al. (1991), Hammon, et al. (1993), and Giroud and Tisinger (1994) for more detail in this regard. At present there is a considerable difference (and cost) between PVC geomembranes made in North America versus Europe. This will be apparent in the exposed study of durability in the second part of this White Paper.

2.5.3 Crosslinking in EPDM and CSPE geomembrnaes

The EPDM geomembranes mentioned in Table 1 are crosslinked thermoset materials. The oxidation degradation of EPDM takes place in either ethylene or propylene fraction of the co-polymer via free radical reactions, as expressed in Figure 5, which are described similarly by Equations (4) to (6).

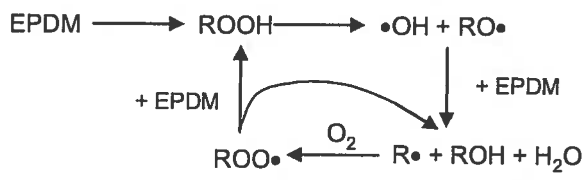


Figure 5. Oxidative degradation of crosslinked EPDM geomembranes, (Wang and Qu, 2003).

For CSPE geomembranes, the degradation mechanism is dehydrochlorination by losing chlorine and generating carbon-carbon double bonds in the main polymer chain, as shown in Figure 6.

The carbon-carbon double bonds become the preferred sites for further thermodegradation or cross-linking in the polymer, leading to eventual brittleness of the geomembrane.

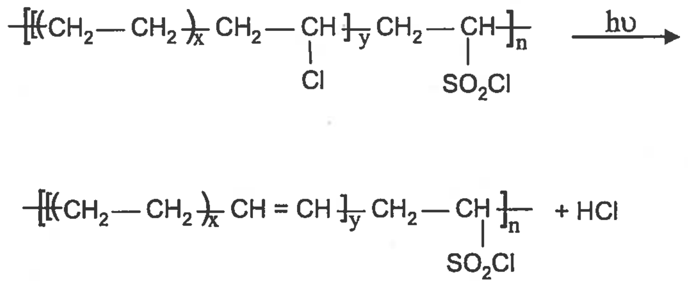


Figure 6. Dechlorination degradation of crosslinked CSPE geomembranes (Chailan, et al., 1995).

Neither EPDM nor CSPE has had a focused laboratory study of the type described for HDPE reported in the open literature. Most of lifetime data for these geomembranes is antidotal by virtue of actual field performance. Under covered conditions, as being considered in this section, there have been no reported failures by either of these thermoset polymers to our knowledge.

3.0 Lifetime Prediction: Exposed Conditions

Lifetime prediction of exposed geomembranes have taken two very different pathways; (i) prediction from anecdotal feedback and field performance, and (ii) from laboratory weathering device predictions.

3.1 Field Performance

There is a large body of anecdotal information available on field feedback of exposed geomembranes. It comes form two quite different sources, i.e., dams in Europe and flat roofs in the USA.

Regarding exposed geomembranes in dams in Europe, the original trials were using 2.0 mm thick polyisobutylene bonded directly to the face of the dam. There were numerous problems encountered as described by Scuero (1990). Similar experiences followed using PVC geomembranes. In 1980, a geocomposite was first used at Lago Nero which had a 200 g/m^2 nonwoven geotextile bonded to the PVC geomembrane. This proved quite successful and led to the now-accepted strategy of requiring drainage behind the geomembrane. In addition to thick nonwoven geotextiles, geonets, and geonet composites have been successful. Currently over 50 concrete and masonry dams have been rehabilitated in this manner and are proving successful for over 30-years of service life. The particular type of PVC plasticized geomembranes used for these dams is proving to be quite durable. Tests by the dam owners on residual properties show only nominal changes in properties, Cazzuffi (1998). As indicated in Miller, et al. (1991) and Hammond, et al. (1993), however, different PVC materials and formulations result in very different behavior; the choice of plasticizer and the material's thickness both being of paramount importance. An excellent overview of field performance is recently available in which 250 dams which have been waterproofed by geomembranes is available from ICOLD (2010).

Regarding exposed geomembranes in flat roofs, past practice in the USA is almost all with EPDM and CSPE and, more recently, with fPP. Manufacturers of these geomembranes regularly warranty their products for 20-years and such warrants appear to be justified. EPDM and CSPE, being thermoset or elastomeric polymers, can be used in dams without the necessity of having seams by using vertical attachments spaced at 2 to 4 m centers, see Scuero and Vaschetti (1996). Conversely, fPP can be seamed by a number of thermal fusion methods. All of these geomembrane types have good conformability to rough substrates as is typical of concrete and masonry dam rehabilitation. It appears as though experiences (both positive and negative) with geomembranes in flat roofs should be transferred to all types of waterproofing in civil engineering applications.

3.2 Laboratory Weatherometer Predictions

For an accelerated simulation of direct ultraviolet light, high temperature, and moisture using a laboratory weatherometer one usually considers a worst-case situation which is the solar maximum condition. This condition consists of global, noon sunlight, on the summer solstice, at normal incidence. It should be recognized that the UV-A range is the target spectrum for a laboratory device to simulate the naturally occurring phenomenon, see Hsuan and Koerner (1993), and Suits and Hsuan (2001).

The Xenon Arc weathering device (ASTM D4355) was introduced in Germany in 1954. There are two important features; the type of filters and the irradiance settings. Using a quartz inner and borosilicate outer filter (quartz/boro) results in excessive low frequency wavelength degradation. The more common borosilicate inner and outer filters (boro/boro) shows a good correlation with solar maximum conditions, although there is an excess of energy below 300 nm wavelength. Irradiance settings are important adjustments in shifting the response although they do not eliminate the portion of the spectrum below 300 nm frequency. Nevertheless, the Xenon Arc device is commonly used method for exposed lifetime prediction of all types of geosynthetics.

UV Fluorescent devices (ASTM D7238) are an alternative type of accelerated laboratory test device which became available in the early 1970's. They reproduce the ultraviolet portion of the sunlight spectrum but not the full spectrum as in Xenon Arc weatherometers. Earlier FS-40 and UVB-313 lamps give reasonable short wavelength output in comparison to solar maximum. The UVA-340 lamp was introduced in 1987 and its response is seen to reproduce ultraviolet light quite well. This device (as well as other types of weatherometers) can handle elevated temperature and programmed moisture on the test specimens.

Research at the Geosynthetic Institute (GSI) has actively pursued both Xenon and UV Fluorescent devices on a wide range of geomembranes. Table 3 gives the geomembranes that were incubated and the number of hours of exposure as of 12 July 2005.

Table 5 - Details of the GSI laboratory exposed weatherometer study on various types of geomembranes

Geomembrane Type	Thickness (mm)	UV Fluorescent Exposure*	Xenon Exposure*	Comment
1. HDPE (GM13)	1.50	8000 hrs.	6600 hrs.	Basis of GRI-GM13 Spec
2. LLDPE (GM17)	1.00	8000	6600	Basis of GRI-GM-17 Spec
3. PVC (No. Amer.)	0.75	8000	6600	Low Mol. Wt. Plasticizer
4. PVC (Europe)	2.50	7500	6600	High Mol. Wt. Plasticizer
5. fPP (BuRec)	1.00	2745**	4416**	Field Failure at 26 mos.
6. fPP-R (Texas)	0.91	100	100	Field Failure at 8 years
7. fPP (No. Amer.)	1.00	7500	6600	Expected Good Performance

*As of 12 July 2005 exposure is ongoing
**Light time to reach halflife of break and elongation

3.3 Laboratory Weatherometer Acceleration Factors

The key to validation of any laboratory study is to correlate results to actual field performance. For the nonexposed geomembranes of Section 2 such correlations will take hundreds of years for properly formulated products. For the exposed geomembranes of Section 3, however, the lifetimes are significantly shorter and such correlations are possible. In particular, Geomembrane #5 (flexible polypropylene) of Table 3 was an admittedly poor geomembrane formulation which failed in 26 months of exposure at El Paso, Texas, USA. The reporting of this failure is available in the literature, Comer, et al. (1998). Note that for both UV Fluorescent and Xenon Arc laboratory incubation of this material, failure (halflife to 50% reduction in strength and elongation) occurred at 2745 and 4416 hours, respectively. The comparative analysis of laboratory and field for this case history allows for the obtaining of acceleration factors for the two incubation devices.

3.3.1 Comparison between field and UV Fluorescent weathering

The light source used in the UV fluorescent weathering device is UVA with wavelengths from 295-400 nm. In addition, the intensity of the radiation is controlled by the Solar Eye irradiance control system. The UV energy output throughout the test is 68.25 W/m^2.

The time of exposure to reach 50% elongation at break was as follows:

= 2745 hr. of light
= 9,882,000 seconds

Total energy in MJ/m^2 = 68.25 W/m^2 × 9,882,000
= 674.4 MJ/m^2

The field site was located at El Paso, Texas. The UVA radiation energy (295-400 nm) at this site is estimated based on data collected by the South Florida Testing Lab in Arizona (which is a similar atmospheric location). For 26 months of exposure, the accumulated UV radiation energy is 724 MJ/m^2 which is very close to that generated from the UV fluorescent weatherometer. Therefore, direct comparison of the exposure time between field and UV fluorescent is acceptable.

Field time vs. Fluorescent UV light time: **Thus, the acceleration factor is 6.8.**
= 26 Months = 3.8 Months

3.3.2 Comparison between field and Xenon Arc weathering

The light source of the Xenon Arc weathering device simulates almost the entire sunlight spectrum from 250 to 800 nm. Depending of the age of the light source and filter, the solar energy ranges from 340.2 to 695.4 W/m^2, with the average value being 517.8 W/m^2.

The time of exposure to reach 50% elongation at break

= 4416 hr. of light
= 15,897,600 seconds

Total energy in MJ/m^2 = 517.8 W/m^2 × 15,897,600
= 8232 MJ/m^2

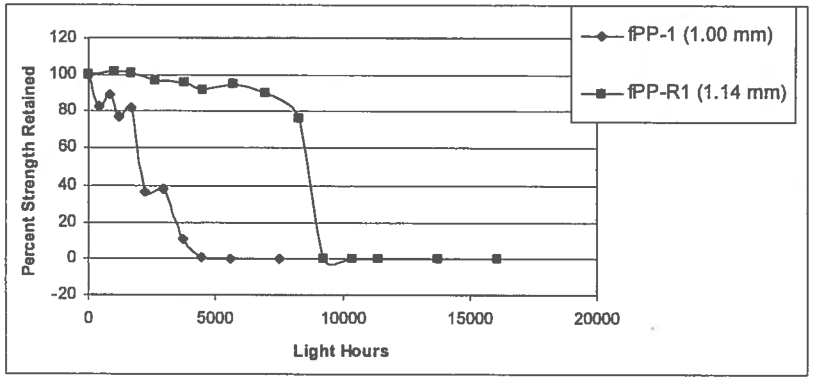
The solar energy in the field is again estimated based on data collected by the South Florida Testing Lab in Arizona. For 26 months of exposure, the accumulated solar energy (295-800 nm) is 15,800 MJ/m^2, which is much higher than that from the UV Fluorescent device. Therefore, direct comparison of halflives obtained from the field and Xenon Arc device is not anticipated to be very accurate. However, for illustration purposes the acceleration factor based on Xenon Arc device would be as follows:

Field = 26 Months vs. Xenon Arc = 6.1 Months : **Thus, the acceleration factor is 4.3.**

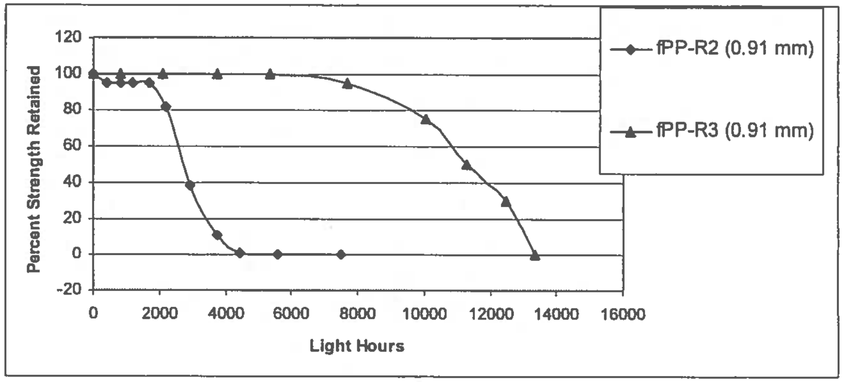
The resulting conclusion of this comparison of weathering devices is that the UV Fluorescent device is certainly reasonable to use for long-term incubations. When considering the low cost of the device, its low maintenance, its inexpensive bulbs, and ease of repair it (the UV Fluorescent device) will be used exclusively by GSI for long-term incubation studies.

3.3.3 Update of exposed lifetime predictions

There are presently (2011) four field failures of flexible polypropylene geomembranes and using unexposed archived samples from these sites their responses in laboratory UV Fluorescent devices per ASTM D7328 at 70°C are shown in Figure 5. From this information we deduce that the average correlation factor is approximately *1200 light hours ≃ one-year in a hot climate.* This value will be used accordingly for other geomembranes.



(a) Two Sites in West Texas



(b) Two Sites in So. Calif.

Lab-to-Field Correlation Factors
(ASTM D7238 @ 70°C)

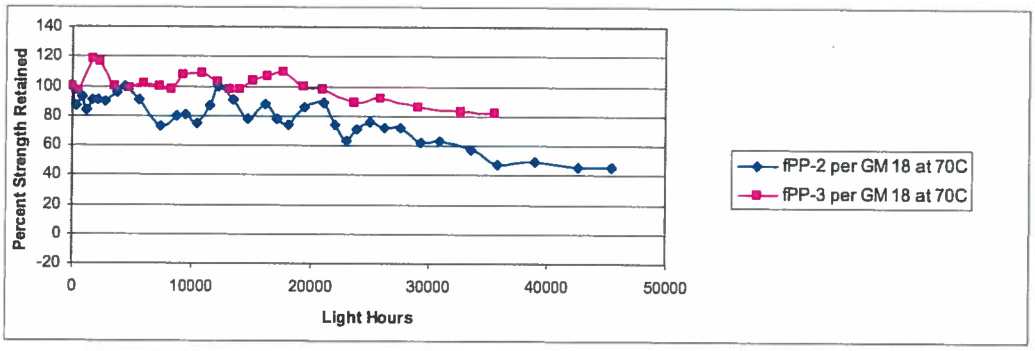
Method	Thickness (mm)	Field (yrs.)	Location	Lab (lt. hr.)	Factor (lt. hrs./1.0 yr.)
fPP-1	1.00	≃ 2	W. Texas	1800	900
fPP-R1	1.14	≃ 8	W. Texas	8200	1025
fPP-R2	0.91	≃ 2	So. Calif.	2500	1250
fPP-R3	0.91	≃ 8	So. Calif.	11200	1400
					1140*

*Use 1200 lt. hr. = 1.0 year in hot climates

Figure 5. Four field failures of fPP and fPP-R exposed geomembranes.

Exposure of a number of different types of geomembranes in laboratory UV Fluorescent devices per ASTM D7238 at 70°C has been ongoing for the six years (between 2005 and 2011) since this White Paper was first released. Included are the following geomembranes:

- Two black 1.0 mm (4.0 mil) unreinforced flexible polypropylene geomembranes formulated per GRI-GM18 Specification; see Figure 6a.
- Two black unreinforced polyethylene geomembranes, one 1.5 mm (60 mil) high density per GRI-GM13 Specification and the other 1.0 mm (40 mil) linear low density per GRI-GM17 Specification; see Figure 6b.
- One 1.0 (40 mil) black ethylene polypropylene diene terpolymer geomembrane per GRI-GM21 Specification; see Figure 6c.
- Two polyvinyl chloride geomembranes, one black 1.0 mm (40 mil) formulated in North America and the other grey 1.5 mm (60 mil) formulated in Europe; see Figure 6d.



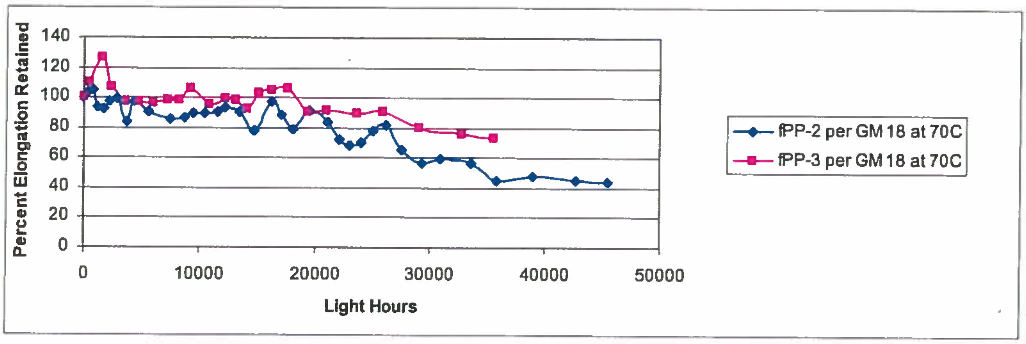
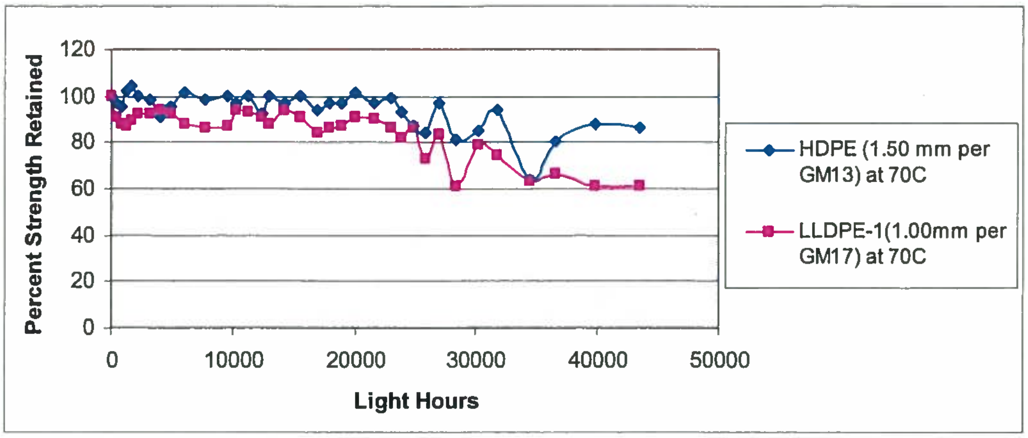


Figure 6a. Flexible polyethylene (fPP) geomembrane behavior.



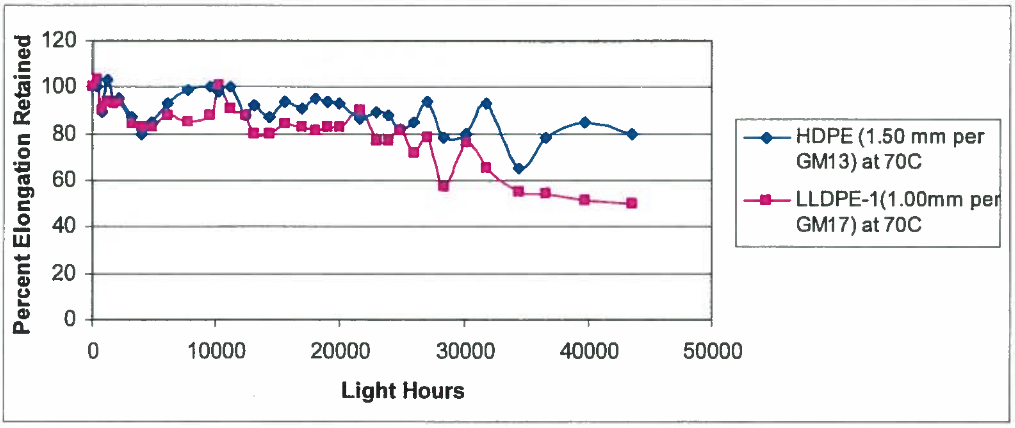
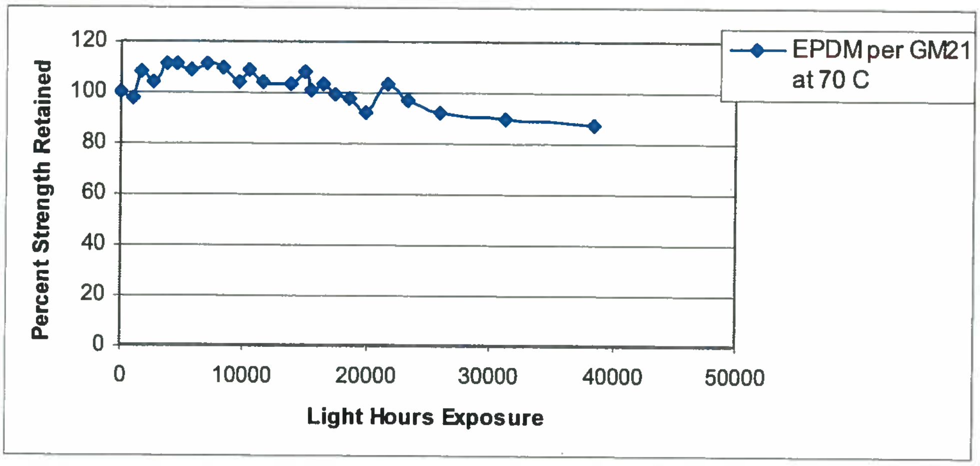


Figure 6b. Polyethylene (HDPE and LLDPE) geomembrane behavior.



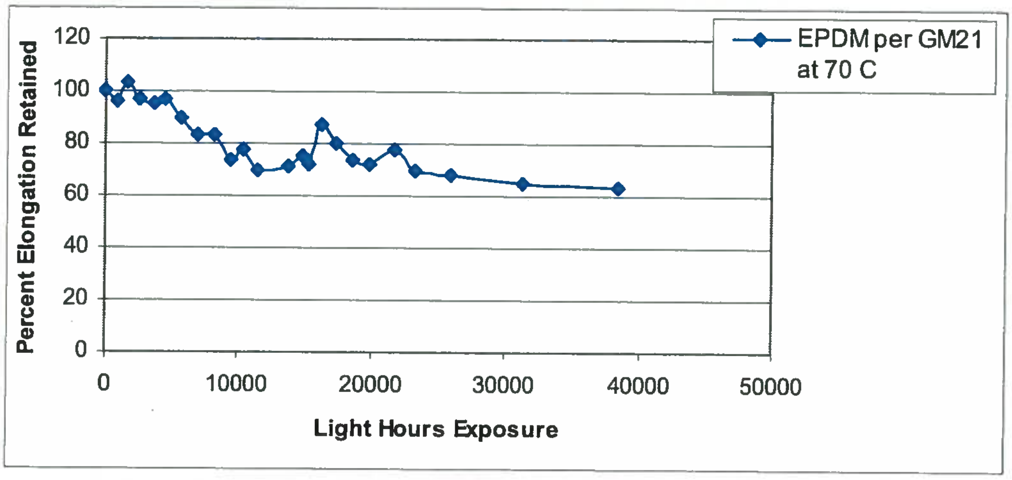


Figure 6c. Ethylene polypropylene diene terpolymer (EPDM) geomembrane.

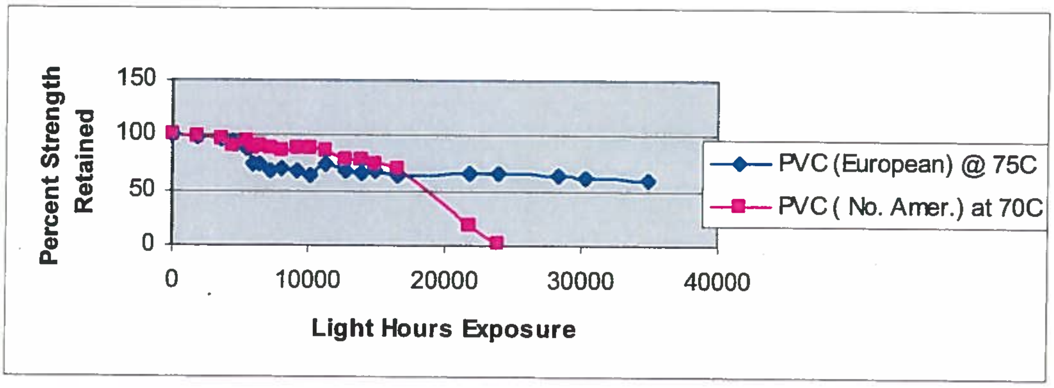


Figure 6d. Polyvinyl chloride (PVC) geomembranes.

From the response curves of the various geomembranes shown in Figure 6a-d, the 50% reduction value in strength or elongation (usually elongation) was taken as being the "halflife". This value is customarily used by the polymer industry as being the materials lifetime prediction value. We have done likewise to develop Table 6 which is our predicted values for the designated exposed geomembrane lifetimes to date.

Table 6 – Exposed lifetime prediction results of selected geomembranes to date

Type	Specification	Prediction Lifetime in a Dry and Arid Climate
HDPE	GRI-GM13	> 36 years (ongoing)
LLDPE	GRI-GM17	≃ 36 years (halflife)
EPDM	GRI-GM21	> 27 years (ongoing)
fPP-2	GRI-GM18	≃ 30 years (halflife)
fPP-3	GRI-GM18	> 27 years (ongoing)
PVC-N.A.	(see FGI)	≃ 18 years (halflife)
PVC-Eur.	proprietary	> 32 years (ongoing)

4.0 Conclusions and Recommendations

This White Paper is bifurcated into two very different parts; covered (or buried) lifetime prediction of HDPE geomembranes and exposed (to the atmosphere) lifetime prediction of a number of geomembrane types. In the covered geomembrane study we chose the geomembrane type which has had the majority of usage, that being HDPE as typically used in waste containment applications. Invariably whether used in landfill liner or cover applications *the geomembrane is covered.* After ten-years of research Table 2 (repeated here) was developed which is the conclusion of the covered geomembrane research program. Here it is seen that HDPE decreases its predicted lifetime (as measured by its halflife) from 446-years at 20°C, to 69-years at 40°C. Other geomembrane types (LLDPE, fPP, EPDM and PVC) have had essentially no focused effort on their covered lifetime prediction of the type described herein. That said, all are candidates for additional research in this regard.

Table 2 - Lifetime prediction of HDPE (nonexposed) at various field temperatures

In Service Temperature (°C)	Stage "A" (years)			Stage "B"	Stage "C"	Total Prediction*
	Standard OIT	High Press. OIT	Average OIT	(years)	(years)	(years)
20	200	215	208	30	208	446
25	135	144	140	25	100	265
30	95	98	97	20	49	166
35	65	67	66	15	25	106
40	45	47	46	10	13	69

*Total = Stage A (average) + Stage B + Stage C

Exposed geomembrane lifetime was addressed from the perspective of field performance which is very unequivocal. Experience in Europe, mainly with relatively thick PVC containing high molecular weight plasticizers, has given 25-years of service and the geomembranes are still in use. Experience in the USA with exposed geomembranes on flat roofs, mainly with EPDM and CSPE, has given 20^+-years of service. The newest geomembrane type in such applications is fPP which currently carries similar warranties.

Rather than using the intricate laboratory setups of Figure 1 which are necessary for covered geomembranes, exposed geomembrane lifetime can be addressed by using accelerating laboratory weathering devices. Here it was shown that the UV fluorescent device (per ASTM D7238 settings) versus the Xenon Arc device (per ASTM D 4355) is equally if not slightly more intense in its degradation capabilities. As a result, all further incubation has been using the UV fluorescent devices per D7238 at 70°C.

Archived flexible polypropylene geomembranes at four field failure sites resulted in a correlation factor of 1200 light hours equaling one-year performance in a hot climate. Using this value on the incubation behavior of seven commonly used geomembranes has resulted in the following conclusions (recall Figure 6 and Table 6);

- HDPE geomembranes (per GRI-GM13) are predicted to have lifetimes greater than 36-years; testing is ongoing.
- LLDPE geomembranes (per GRI-GM17) are predicted to have lifetimes of approximately 36-years.
- EPDM geomembranes (per GRI-GM21) are predicted to have lifetimes of greater than 27-years; testing is ongoing.
- fPP geomembranes (per GRI-GM18) are predicted to have lifetimes of approximately 30-years.
- PVC geomembranes are very dependent on their plascitizer types and amounts, and probably thicknesses as well. The North American formulation has a lifetime of approximately 18-years, while the European formulation is still ongoing after 32-years.

Regarding continued and future recommendations with respect to lifetime prediction, GSI is currently providing the following:

(i) Continuing the exposed lifetime incubations of HDPE, EPDM and PVC (European) geomembranes at 70°C.

(ii) Beginning the exposed lifetime incubations of HDPE, LLDPE, fPP, EPDM and both PVC's at 60°C and 80°C incubations.

(iii) With data from these three incubation temperatures (60, 70 and 80°C), time-temperature-superposition plots followed by Arrhenius modeling will eventually provide information such as Table 2 for covered geomembranes. This is our ultimate goal.

(iv) Parallel lifetime studies are ongoing at GSI for four types of geogrids and three types of turf reinforcement mats at 60, 70 and 80°C.

(v) GSI does not plan to duplicate the covered geomembrane study to other than the HDPE provided herein. In this regard, the time and expense that would be necessary is prohibitive.

(vi) The above said, GSI is always interested in field lifetime behavior of geomembranes (and other geosynthetics as well) whether covered or exposed.

Acknowledgements

The financial assistance of the U. S. Environmental Protection Agency for the covered HDPE lifetime study and the member organizations of the Geosynthetic Institute and its related institutes for research, information, education, accreditation and certification is sincerely appreciated. Their identification and contact member information is available on the Institute's web site at <<geosynthetic-institute.org>>.

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ENCLOSURE 4

NMED Flow Meter Calibration
(prepared by Robert George, NMED-GWQB)

ENV-DO-15-0137

LA-UR-15-23614

Date: MAY 2 0 2015

Exhibit (how to calibrate)

Flow Meter Calibration

Prepared by Robert George, NMED-GWQB

Definition of Flow Meter Calibration

The Bureau of Reclamation's *Water Measurement Manual* defines calibration as:

"**Calibration** is the process used to check or adjust the output of a measuring device in convenient units of gradations. During calibration, manufacturers also determine robustness of equation forms and coefficients and collect sufficient data to statistically define accuracy performance limits. In the case of long-throated flumes and weirs, calibration can be done by computers using hydraulic theory. Users often do less rigorous calibration of devices in the field to check and help correct for problems of incorrect use and installation of devices or structural settlement. A calibration is no better than the comparison standards used during calibration."

This definition makes clear that calibration is the act of comparing and adjusting a measuring device against a standard. It also highlights that there are different levels of calibration that are performed for different purposes. NMED has proposed that all flow measurement devices be calibrated in-place, under actual operating conditions (field calibration) to within ± 10% of the actual flow. Calibrations are required following the installation of a device, repair of a device and annually thereafter. This proposal fits the latter description of calibration from the definition above, which is a calibration performed by users to a less rigorous standard for the purposes of checking and correcting problems with newly installed or repair devices or for devices that have been affected over the course of time. It is not intended to require a rigorous field calibration to determine the maximum accuracy that a manufactured device is capable of achieving in a particular setting, which NMED recognizes would be overly time-consuming, difficult and costly.

The Need for Flow Meter Equipment Field Calibration

The need for field flow meter equipment calibration is not obvious to some. Devices are frequently sold with statements that no calibration is required in order to achieve a stated accuracy, provided the device is installed and maintained in accordance with specific requirements. In the case of an ideal installation, this statement may be true. However, what is not considered is that: (1) most installation situations require compromise which leads to less that ideal installation conditions, (2) there are a wide variety of errors that can contribute to inaccuracy and these often go unidentified, and; (3) degradation tends to affect the accuracy of all installations over time in a manner that cannot be predicted. Without field calibration of flow measurement devices, NMED has no way of determining that gross inaccuracy of a flow measurement device does not exist. To this

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end, NMED is less concerned with absolute precision than with verifying that measurements are reasonably accurate and repeatable over time.

Definition of Terms Related to Calibration Accuracy
(Adapted from the Bureau of Reclamation's Water Measurement Manual)

Precision is the ability to produce the same value within given accuracy bounds when successive readings of a specific quantity are measured. Precision represents the maximum departure of all readings from the mean value of the readings. Thus, a measurement cannot be more accurate than the inherent precision of the combined primary and secondary device precision.

Error is the deviation of a measurement, observation, or calculation from the truth. The deviation can be small and inherent in the structure and functioning of the system and be within the bounds or limits specified. Lack of care and mistakes during fabrication, installation, and use can often cause large errors well outside expected performance bounds. Since the true value is seldom known, some investigators prefer to use the term uncertainty.

Spurious errors are commonly caused by accident, resulting in false data. Misreading and intermittent mechanical malfunction can cause discharge readings well outside of expected random statistical distribution about the mean. A hurried operator might incorrectly measure discharge on a staff gauge. Spurious errors can be minimized by good supervision, maintenance, inspection, and training. Experienced, well-trained operators are more likely to recognize readings that are significantly out of the expected range of deviation. Unexpected blockages of flow in the approach or in the device itself can cause spurious errors. Repeating measurements does not provide any information on spurious error unless repetitions occur before and after the introduction of the error. On a statistical basis, spurious errors confound evaluation of accuracy performance.

Systematic errors are errors that persist and cannot be considered entirely random. Systematic errors are caused by deviations from standard device dimensions. Systematic errors cannot be detected by repeated measurements. They usually cause persistent error on one side of the true value. For example, error in determining the crest elevation for setting staff or recorder chart gage zeros relative to actual elevation of a weir crest causes systematic error. The error for this case can be corrected when discovered by adjusting to accurate dimensional measurements. Worn, broken, and defective flow meter parts, such as a permanently deformed, over-stretched spring, can cause systematic errors. This kind of systematic error is corrected by maintenance or replacement of parts or the entire meter. Fabrication error comes from dimensional deviation of fabrication or construction allowed because of limited ability to exactly reproduce important standard dimensions that govern pressure or heads in measuring devices. Allowable tolerances produce small systematic errors which should be specified.

Calibration equations can have systematic errors, depending on the quality of their derivation and selection of form. Equation errors are introduced by selection of equation forms that usually only approximate calibration data. These errors can be reduced by finding better equations or by using more than one equation to cover specific ranges of measurement. In some cases, tables and plotted curves are the only way to present calibration data.

Random errors are caused by such things as the estimating required between the smallest division on a head measurement device and water surface waves at a head measuring device. Loose linkages between parts of flow meters provide room for random movement of parts relative to each other, causing subsequent random output errors. Repeating readings decreases average random error by a factor of the square root of the number of readings.

Total error of a measurement is the result of systematic and random errors caused by component parts and factors related to the entire system. Sometimes, error limits of all component factors are well known. In this case, total limits of simpler systems can be determined by computation. In more complicated cases, different investigators may not agree on how to combine the limits. In this case, only a thorough calibration of the entire system as a unit will resolve the difference. In any case, it is better to do error analysis with data where entire system parts are operating simultaneously and compare discharge measurement against an adequate discharge comparison standard.

Comparison standards for water measurement are systems or devices capable of measuring discharge to within limits at least equal to the desired limits for the device being calibrated. Outside of the functioning capability of the primary and secondary elements, the quality of the comparison standard governs the quality of calibration.

Discrepancy is simply the difference of two measurements of the same quantity. Even if measured in two different ways, discrepancy does not indicate error with any confidence unless the accuracy capability of one of the measurement techniques is fully known and can be considered a working standard or better.

Flow Measurement Device Field Calibration

NMED is seeking to have initial and routine calibrations performed on flow measurement devices under actual operating conditions (field calibrations). Field calibrations of this type are to be performed by individuals knowledgeable in flow measurement and in the installation/operation of the particular device. As mentioned before, this type of calibration is performed for the purposes of checking and correcting problems with newly installed or repaired devices or for devices that may have been affected over the course of time and is recognized to be held to a less rigorous standard than a full characterization of a device to it maximum accuracy. NMED is proposing that accuracy of flow measuring devices be maintained to within ± 10% of the comparison standard discharge (actual flow). The acceptable level of accuracy to be attained by the comparison standard discharge is at least equal to that of the allowable error of the device being calibrated (± 10%). The comparison standard is accepted to be "actual flow" but understood to contain some (undetermined) systematic and random level of error, although reasonable efforts should be made to minimize both. Spurious errors in establishing the comparison standard are to be largely avoided by careful oversight.

Typically during field calibration, the measurement output of the flow measurement device is evaluated at a stable discharge rate against the comparison standard. The discrepancy between the indicated discharge for the device and the actual flow (as determined by the comparison standard) is use to calculate percent of error (offset) as follows:

$$E\%Q_{Cs} = \frac{100(Q_{Ind} - Q_{Cs})}{Q_{Cs}}$$

Where:

Q_{Ind} = indicated discharge from device output
Q_{Cs} = comparison standard discharge concurrently measured in a more precise way
E%QCs= offset error in percent of comparison standard discharge

The level of error detected during the calibration represents the positive or negative offset of the device from the actual flow. Technically, this is not a statistically appropriate representation of the measurement error of the device, because no attempt at characterizing the accuracy of the calibration standard or of the discrepancy of the output of the device from the calibration standard throughout the measurement range (zero, mid-range and full scale) is made. Additionally, the level of inaccuracy allowable (± 10%) is not defined in terms of scale (zero, mid-range, full scale), so ±10% is potentially acceptable at any range. However, because NMED is less concerned with absolute precision than with attaining a reasonable accuracy and a reasonable degree of repeatability, this level of calibration measurement is sufficient for this purpose. More sophisticated statistical analysis of the accuracy of a measurement device will be accepted by NMED, provided it follows accepted principals for calibration.

If the offset of the device is beyond the bounds of ± 10% of the calibration standard, adjustment of the device to bring it within these bounds is appropriate and should be attempted and the calibration rechecked. If the device shows a high level of inaccuracy beyond these bounds, displays an inability to repeat a measurement (within the same bounds), or calibration to within ± 10% cannot be attained, a faulty device or non-standard installation may be indicated and more in-depth investigation and device repair/replacement may be warranted.

Calibration of Hydraulic Structure Primary Measuring Devices

Hydraulic structure primary measuring devices are capable of accuracies of varying degree, dependent upon the device type and the range that it is operating in (scale) compared with its design range (full scale). Virtually all hydraulic structure primary measuring devices are capable of accuracies within ± 10% when installed in accordance with the specific requirements for each unique device. Beneficially, under most circumstances, the errors that can adversely affect the accuracy of hydraulic structure primary measuring devices are relatively limited and easy to detect. Should a hydraulic structure be installed improperly or damaged in place, problems with its operation can be readily identified by visual inspection (provided the inspector has an understanding of the function of the particular structure type). Once identified, most problems are easily corrected. Put simply, this class of device is fairly easy to install in a manner that will produce reasonably accurate results and the causes of inaccuracy are readily indentified.

Because of these two characteristics, hydraulic structure primary measuring devices, when installed correctly, constitute a suitable comparison standard discharge (in and of themselves) which can therefore be used to represent "actual flow" for the purposes of calibrating secondary devices (head sensing, readout and totalizers). For this reason, NMED is not seeking field calibration of *standard* hydraulic structure primary measuring devices. The ability to act as a calibration standard and the inherit simplicity of these devices, accounts for their widespread use throughout the water supply, wastewater treatment and agricultural industries.

Calibration of Head Sensing, Readout and Totalizing Secondary Devices

In the case of head sensing, readout and totalizing equipment, initial and routine calibration/adjustment by comparison to the hydraulic structure primary measuring device is necessary to ensure that accurate flow measurements are first established and then maintained. NMED is proposing that calibrations be performed initially and then annually thereafter. When an initial or routine calibration is performed, the degree of inaccuracy (positive or negative offset) is characterized in relation to the flow in the hydraulic structure primary device.

Calibration of Commercial Velocity Sensing Meters

Commercial meters are sold with the device's stated accuracy clearly identified. Many meters claim that the device is sold pre-calibrated and that no field (sometimes referred to as "wet") calibration is needed. Some of the newest velocity sensing meters do allow diagnostics of the primary device elements (e.g. mag-meters often have the ability to self check their magnetic field characteristics), but they do not provide a suitable comparison standard discharge in and of themselves. Furthermore, what is not typically clear is that any deviation from the laboratory conditions under which the device was calibrated can result in inaccuracy. For example; the application of a device that was calibrated on clean water to measuring wastewater with a high concentration of suspended solids could greatly affect accuracy. Unexpected (or detected) turbulence induced prior to a meter can result in very different performance than during calibration conditions. The length of pipe prior to and after a meter, the pipe material and even the roughness of the interior surface of the pipe can affect accuracy. The incident angle that a device is mounted at can affect accuracy and function. In fact, a great number of systematic, random and spurious errors can contribute to inaccuracies in real world conditions. Worse, these errors are generally not readily observable or measurable in closed-pipe systems and therefore not easily detected. NMED has no way of ensuring that closed-pipe flow measurement devices have been installed and are operating completely within the manufacturer's requirements, and therefore capable of accurate flow measurement. For this reason, field calibration of the primary and secondary elements of commercial closed-pipe velocity sensing meters is critical.

The selection of a suitable comparison standard discharge for the field calibration of commercial velocity sensing meters requires skill and knowledge about flow measurement. NMED is seeking to have individuals knowledgeable in flow measurements with the particular device in use develop and perform field calibrations. Examples of the type of comparison standard discharges that could be utilized for field commercial meter calibrations include:

- Volume/time comparison, where a known volume of liquid moves through the meter in a known amount of time. For example, the liquid level in a sump of known dimensions is measured before and after a pump moves liquid from the sump and through the meter over a five minute interval. By calculating the volume of liquid pumped in five minutes, a comparison standard discharge can be established. The totalized meter reading discrepancy from the actual flow for the five minute interval can be determined and the meter offset calculated. Errors of measurement and timing must be controlled.
- A standard hydraulic device primary measuring structure, such as an orifice plate can be inserted in the pipe metered by the device in question. Head readings taken at standard locations before and after the orifice plate can be used to determine the discharge (using an equation or table specific for the orifice plate) and the discharge can be used as a comparison standard discharge. Care must be taken in the centering of the orifice plate and in the head readings. The method can typically only be employed on wastewater for short calibration durations due to plugging at the head measurement locations.
- A standard hydraulic structure primary measuring device, such as a weir or flume can be constructed at the outlet of the discharge stream so that the actual discharge can be determined from the weir or flume for comparison by the close-pipe measuring device output.

NMED acknowledges that field calibration of commercial in-pipe meters can be difficult to accomplish under many circumstances but contends that field calibrations are necessary to eliminate gross inaccuracies of flow measurements at dairy facilities. NMED is seeking to have field calibration procedures outlined by dairy facilities (as opposed to requiring specific approaches) to allow the use of the least expensive, most easily accomplished procedure for a given facility. NMED is proposing that calibration procedures be performed by individuals with experience in flow measurement and the use of the particular device in question. NMED anticipates that a variety of calibration methods will be used, as applicable in various settings.

Flow Meter Calibration Reports

NMED is proposing to have dairy facilities submit a flow meter calibration report annually to demonstrate that flow measurements are achieving the required level of accuracy. The reports are required to contain an identification of the flow meter consistent with the Discharge Permit, the location of thé meter, the method of flow meter calibration employed (assumed to be a narrative description), the measured accuracy of the meter before and after adjustment and a list of any repairs made to the meter in the previous year.

The report is to be submitted in the facility's monitoring report due by May 1 of each year.

References

United States Department of the Interior, Bureau of Reclamation, *Water Measurement Manual*, Revised Reprint 2001, available at:
http://www.usbr.gov/pmts/hydraulics_lab/pubs/wmm/

United States Department of the Interior, Environmental Protection Agency, NPDES Compliance Inspection Manual, Chapter 6, Flow Measurement, available at:
http://www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesmanual.html

ENCLOSURE 5

USEPA wastewater flow measurement procedures

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Date: MAY 20 2015

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Region 4 **U.S. Environmental Protection Agency** **Science and Ecosystem Support Division** **Athens, Georgia**
OPERATING PROCEDURE
Title: **Wastewater Flow Measurement**
Effective Date: August 12, 2011 — **Number:** SESDPROC-109-R3
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Revision History

This table shows changes to this controlled document over time. The most recent version is presented in the top row of the table. Previous versions of the document are maintained by the SESD Document Control Coordinator.

History	Effective Date
SESDPROC-109-R3, *Wastewater Flow Measurement*, Replaces SESDPROC-109-R2 **General:** Corrected any typographical, grammatical and/or editorial errors. **Cover Page:** The EIB Branch Chief was changed from Antonio Quinones to Archie Lee. The FQM was changed from Laura Ackerman to Liza Montalvo. **Section 1.2:** Added the following statement: Mention of trade names or commercial products in this operating procedure does not constitute endorsement or recommendation for use. **Section 1.3:** Omitted the reference to the H: drive of the LAN. **Section 1.4:** Updated references 1, 2, 6 and 7 to reflect that the most recent edition/version will be used. Corrected reference 8.	August 12, 2011
SESDPROC-109-R2, *Wastewater Flow Measurement*, Replaces SESDPROC-109-R1 **Revision History** Changed Field Quality Manager to Document Control Coordinator. **Section 1.3** Changed Field Quality Manager to Document Control Coordinator. **Sections 1.4** Added reference 16. **Section 1.5** Corrected SHEMP Manual name. **Section 1.5.2** Deleted sentence "This minimizes the opportunity for accidents." **Section 2.2** Re-phrased for clarity. **Section 2.3** Clarified last sentence of the second paragraph.	June 13, 2008

Section 2.4 Re-named this section, re-arranged paragraphs, and added language for clarity. Replaced "should" and "shall" with "will," when applicable. **Section 2.5** Re-numbered Sections 2.5.2, 2.5.3, 2.5.4, 2.5.5 to 2.5.1.1, 2.5.1.2, 2.5.1.3, and 2.5.2, respectively. **Section 2.6.4** Added the ISCO® area-velocity flow meter method. **Section 2.7.2** Deleted pipe diameter requirements. **Section 3** Deleted the first and last sentence of first paragraph. Replaced "shall" with "will." **Section 3.1** New section on Operational Check. **Section 5** Deleted Section on Quality Control and replaced with Records.	
SESDPROC-109-R1, *Wastewater Flow Measurement*, replaces SESDPROC-109-R0 **General** Deleted all references to SOSA. Updated referenced procedures due to changes in title names and/or to reflect the most recent version. **Title Page** Changed title for Antonio Quinones from Environmental Investigations Branch to Enforcement and Investigations Branch. **Section 1.3** Updated information to reflect that procedure is located on the H: drive of the LAN. **Sections 1.4** Added references 14 and 15.	November 1, 2007
SESDPROC-109-R0, Wastewater Flow Measurement, Original Issue	February 05, 2007

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1 General Information

1.1 Purpose

This document describes general and specific procedures, methods and considerations to be used and observed when conducting flow measurement during field investigations.

1.2 Scope/Application

The procedures contained in this document are to be used by field personnel when conducting flow measurement in the field. On the occasion that SESD field personnel determine that any of the procedures described in this section are inappropriate, inadequate or impractical and that another procedure must be used to obtain flow measurement data, the variant procedure will be documented in the field logbook, along with a description of the circumstances requiring its use. Mention of trade names or commercial products in this operating procedure does not constitute endorsement or recommendation for use.

1.3 Documentation/Verification

This procedure was prepared by persons deemed technically competent by SESD management, based on their knowledge, skills and abilities and has been tested in practice and reviewed in print by a subject matter expert. The official copy of this procedure resides on the SESD local area network (LAN). The Document Control Coordinator is responsible for ensuring the most recent version of the procedure is placed on the LAN and for maintaining records of review conducted prior to its issuance.

1.4 References

1. Water Measurement Manual, U.S. Department of the Interior, Bureau of Reclamation, Most Recent Edition.

2. National Pollutant Discharge Elimination System (NPDES) Compliance Inspection Manual, U.S. Environmental Protection Agency, Most Recent Version.

3. SESD Operating Procedure for Hydrological Studies, SESDPROC-501, Most Recent Version.

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6. Stevens Water Resources Data Book, Stevens Water Monitoring Systems, Inc., Portland, Oregon, Most Recent Edition.

7. ISCO® Open Channel Flow Measurement Handbook, Teledyne ISCO, Inc., Lincoln, Nebraska, Most Recent Edition.

8. "Discharge Measurements at Gaging Stations," Chapter 8 of Book 3, Section A, U.S. Department of Interior, U.S. Geological Survey, Reston, Virginia, 2010.

9. "Sewer Flow Measurement: A State-of-the-Art Assessment," Municipal Environmental Research Laboratory, Office of Research and Development, U. S. Environmental Protection Agency: Cincinnati, Ohio, 600-275027.

10. A Guide to Methods and Standards for the Measurement of Water Flow, U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, 1975.

11. Wells, E. A. and H. B. Gotaas, "Design of Venturi Flumes in Circular Conduits," American Society of Civil Engineers, 82, Proc. Paper 928, April 1956.

12. American Society of Testing Materials, 1985 Annual Book of ASTM Standards, Volume 11 - Water, American Society of Testing Materials: Philadelphia, Pennsylvania, 1985.

13. US EPA Region 4 Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), November 2001.

14. SESD Operating Procedure for Logbooks, SESDPROC-010, Most Recent Version.

15. SESD Operating Procedure for Control of Records, SESDPROC-002, Most Recent Version.

16. US EPA. Safety, Health and Environmental Management Program Procedures and Policy Manual. Region 4 SESD, Athens, GA, Most Recent Version.

1.5 General Precautions

1.5.1 Safety

Proper safety precautions must be observed when collecting flow measurement data. Refer to the SESD Safety, Health and Environmental Management Program Procedures and Policy (SHEMP) Manual and any pertinent site-specific Health and Safety Plans (HASPs) for guidelines on safety precautions. These guidelines should be used to complement the judgment of an experienced professional.

When using this procedure, minimize exposure to potential health hazards through the use of protective clothing, eye wear and gloves.

1.5.2 Procedural Precautions

The following precautions should be considered when collecting flow measurement data:

- Special care must be taken when walking around open flow channels.
- A safety harness is required when the danger of falling into a large volume of fast moving water presents a life threatening situation.
- Always watch footing and use hand rails at the facility to minimize accidents during walk-through of the facility.
- Watch for overhead power lines when installing flow measurement equipment.
- Wear personal protection equipment when appropriate.
- Watch for uncovered grating during walk-through.

2 Wastewater Flow Considerations

2.1 Introduction

The U.S. Department of the Interior (USDOI) Water Measurement Manual (1) is a standard reference for details on checking the installation of primary open channel flow devices. Basic guidance for making wastewater flow measurements and a basic description of all acceptable wastewater flow measurement systems are given in the EPA National Pollutant Discharge Elimination System (NPDES) Compliance Inspection Manual (2). This manual will be used by SESD field investigators as guidance for such measurements.

2.2 Site Selection

It is the field investigator's responsibility to ensure that the facility's influent or effluent wastewater flow measurement system or technique used measures the total wastewater discharged (described by the NPDES permit, if applicable). The location of influent wastewater flow measurement equipment should be prior to all recycled wastewaters streams.

2.3 Flow Measurement Systems

Flow may be measured on an instantaneous or a continuous basis. A typical continuous system consists of a primary flow device, a flow sensor, transmitter, flow recorder, and totalizer. Instantaneous flow measurements can be obtained by using the primary flow device. Techniques which are described later in this Section are available for measuring instantaneous flows with portable equipment.

The heart of a typical continuous flow measurement system is the primary flow device. This device is constructed to produce predictable hydraulic responses which are related to the flow rate of water or wastewater through it. Examples of such devices include weirs and flumes which relate water depth (head) to flow, Venturi and orifice type meters which relate differential pressure to flow, and magnetic flow meters which relate induced electric voltage to flow. These standard primary flow devices, if installed and built according to established standards, have proven to be accurate.

A flow sensor is required to measure the particular hydraulic responses of the primary flow measurement device and transmit the responses to the recording system. Typically, sensors include ultra-sonic transmitters, floats, pressure transducers, capacitance probes, differential pressure cells, electromagnetic cells, etc. The sensor signal is generally converted using mechanical, electro mechanical or electronic systems into units of flow which are recorded directly on a chart or transmitted into a data system. Systems which utilize a recorder are generally equipped with a flow totalizer which displays the total flow on a real time basis.

An important consideration for the investigator during wastewater studies is obtain continuous flow data at a facility where only instantaneous flow data are being measured. If an open channel primary flow device is utilized for making instantaneous measurements, only the installation of a portable field sensor and recorder is necessary. If, on the other hand, the facility being investigated does not utilize a primary flow device, and a continuous flow record is desired, a Son Tek Argonaut-SW® current flow meter can be used or a portable primary flow device will have to be installed. Field investigators have open channel equipment available for field use. These devices should be installed according to the manufacturer's instructions.

Wastewater flow measurement systems are generally very accurate. Any continuous flow measurement system that cannot measure the wastewater flow within $\pm$10 percent of the actual flow is considered unacceptable for use in measuring wastewater flow.

2.4 Field Investigation Procedures

During the investigation, the field investigator will verify that the facility's flow measurement system (including primary flow device) provides flow data within $\pm$10 percent of the actual flow. The primary flow device and the secondary system will be checked to determine if they conform to recognized design and installation standards. Deviations from standard conditions will be documented. The facility chart recorder will be checked to verify that the time and scale are correct. The accuracy of the flow measurement system is checked by making an instantaneous flow measurement and comparing this reading against the facility's instantaneous flow reading. In addition, EPA flow equipment can be installed to confirm the facility's totalizer readings. This flow measurement device should be set up as close as possible to the facility's flow measurement equipment and in the same water or wastewater stream. An instantaneous flow reading will be documented in the field book or on the flow chart recorder when possible.

The installation of systems to measure wastewater flows can be time consuming, particularly if there is no primary device. Therefore, field personnel can use existing facility primary flow devices and flow measurement systems when the accuracy of these devices and the system can be verified. The field investigator will verify that an existing facility flow measurement system (including primary flow device) utilized to measure wastewater flow conforms to recognized design and installation standards, and any deviation from standard conditions will be documented. The accuracy of the primary flow device may be checked by making an independent flow measurement. If there is no usable or existing primary flow measuring device or if the device has been located in the wrong place, the investigator may, if so desired, install a portable primary flow device. The accuracy of flow sensors and recorders for open channel flow devices can be checked by making an instantaneous measurement utilizing the primary flow device and comparing this against the recorder reading. If the discharger's flow measurement system is accurate within $\pm$10 percent of the actual flow, the investigator can use the existing system.

If non-standard primary flow devices are being used, data supporting the accuracy and precision of the methods being employed should be provided by the permittee. Deficiencies found during the inspection will be recorded by the investigator, and the permittee informed that the equipment should be calibrated as soon as possible.

2.5 Specific Techniques

This section familiarizes the field investigator with the most commonly used methods for wastewater flow measurements and the primary devices that will be encountered during field studies. The following methods are included only to enable the field investigator to make accurate flow estimates when necessary.

2.5.1 Volumetric

Volumetric flow measurement techniques are among the simplest and most accurate methods for measuring flow. These techniques basically involve the measurement of volume and/or the measurement of time required to fill a container of known size.

2.5.1.1 Vessel Volume

Vessel volume is used to obtain flow data particularly applicable to batch wastewater discharges. Accurate measurement of the vessel volume and the frequency at which it empties is all that is required.

2.5.1.2 Sump Pump

This measurement is made by observing the sump levels when the pumps cut on and off and calculating the volume contained between the two levels. This volume, along with the number of pump cycles, will give a good estimate of the daily wastewater flow. The inspector must also account for the quantity of wastewater that flows into the sump during the pumping cycle.

2.5.1.3 Bucket and Stop Watch

The bucket and stop watch technique is particularly useful for the measurement of small wastewater flows. It is simple to use. The only equipment required to make this measurement is a calibrated container (bucket, drum, tank, etc.) and a stop watch. A minimum of 10 seconds to fill the container is recommended. Three consecutive measurements should be made, and the results should be averaged.

2.5.2 Dilution Methods

Dilution methods for water and wastewater flow measurements are based on the color, conductivity, fluorescence, or other quantifiable property of an injected tracer. The dilution methods require specialized equipment, special attention to detail by the investigator, and are time consuming. Dilution methods are described in SESD Operating Procedure for Hydrological Studies (SESDPROC-501). (3)

2.6 Open Channel Flow Measurements

Measurement of wastewater flow in open channels is the most frequently encountered situation during field investigations. An open channel is defined as any open conduit, such as a channel or flume, or any closed conduit, such as a pipe, which is not flowing full. The most commonly encountered methods in measuring open channel wastewater flows are described in this section.

2.6.1 Weirs

A weir is defined as an overflow structure built according to specific design standards across an open channel to measure the flow of water. Equations can be derived for weirs of specific geometry which relate static head to water flow. Weirs are classified into two general categories, broad crested and sharp crested.

Broad crested weirs take the following form; Q=CLH3/2. Values for the coefficient C are given in hydraulic handbooks (4, 5). Broad crested weirs can only be used to calculate instantaneous flows.

Sharp crested weirs are constructed in a wide variety of shapes and the most commonly encountered are V-notch, rectangular, and Cipolletti weirs. If such weirs are constructed as outlined in the USDOI Water Measurement Manual (1), they are considered standard primary flow devices.

All weirs should be inspected to determine if the weir installation and construction conform to the conditions given in the USDOI Water Measurement Manual (1), and provide a uniform influent flow distribution, and that the weir is placed squarely across the channel perpendicular to the direction of flow. Useful tools for checking weir construction and installation include a carpenter's level, a framing square, a measuring tape, a staff gage, or surveyor’s level and rod. Problems observed during the inspection or study should be noted in the field records or logbook.

A set of weir tables is necessary for calculating the flow. The USDOI Water Measurement Manual (1), the Stevens Water Resources Data Book (6), and the ISCO® Open Channel Flow Measurement Handbook (7) contain a complete set of tables.

2.6.2 Flumes

There are several types of flumes (e.g., Palmer-Bowlus, Cutthroat, H, and Trapezoidal) but the most widely used is the Parshall flume. The Parshall flume is considered a standard primary flow device when constructed and installed as outlined in the USDOI Water Measurement Manual (1).

All flumes should be inspected to determine if entrance conditions provide a uniform influent flow distribution, the flume dimensions conform to those given in the USDOI Water Measurement Manual (1), the floor of the flume at the throat section is level, and the throat section walls are vertical. Useful tools for checking the construction and installation of Parshall (and other) flumes include a carpenter's level, a framing square, and a measuring tape. The flume should be closely examined to determine if it is discharging freely. If there is any question about free discharge, the downstream head (Hb) should be measured and compared to the head at the proper location (Ha) in the converging section. A staff gage is useful for making head measurements. Any problems observed during the inspection or study should be noted in the field logbook.

A set of flume tables is necessary for calculating flows. The USDOI Water Measurement Manual (1), the Stevens Water Resources Data Book (6), and the ISCO® Open Channel Flow Measurement Handbook (7) contain a complete set of tables. The explanatory material accompanying these tables should be read and understood before they are used. Tabulated flow values are given for measured head values to determine accuracy.

2.6.3 Open Flow Nozzles

Open flow nozzles such as parabolic or Kennison nozzles are factory calibrated and are ordinarily supplied as part of a flow measurement system. Calibration and installation information for each nozzle should be supplied by or obtained from the manufacturer. The accuracy of these devices is reported to be often better than ± 5 percent of the indicated flow. A volumetric flow measurement may be used to check accuracy of this device if flow volumes are not excessive.

2.6.4 Velocity-Area Method

The basic principle of this method is that the flow in a channel (cubic feet/second) is equal to the average velocity (feet/second) times the cross sectional area (square feet) of the channel. SESD has two methods for determining flow using the area velocity method. The first method uses an ISCO® area-velocity flow meter in which the probe senses velocity and water depth and converts these readings to a flow rate. In the second method, the velocity of the water or wastewater is determined with an Argonaut-SW® current flow meter (which can also calculate cross-sectional area changes) or a current meter. The area of the channel is either measured or calculated using an approximation technique. Refer to SESD Operating Procedure for Hydrological Studies (SESDPROC-501) (3) for Surface Water Flow Measurements.

2.7 Closed Conduit Flow Measurements

The accuracy of closed conduit flow measuring devices may be difficult to verify. However, the accuracy can be checked by making an independent flow measurement. Two of the available procedures are the Instruments Direct® F-100-902 Ultrasonic Doppler flow meter and a dilution technique. Refer to SESD Operating Procedure for Hydrological Studies (SESDPROC-501) (3).

Below are some of the more commonly used closed conduit devices.

2.7.1 Venturi Meter

The Venturi meter employs a conversion of static head to velocity head whereby a differential is created that is proportional to flow. The typical accuracy of a Venturi meter is at ± 1 to 2 percent (9, 10, 11 and 12).

2.7.2 Orifice Meter

The orifice meter is a pressure differential device that measures flow by the difference in static head. They can be accurate, e.g., within ± 0.5 percent, although their usable range is limited.

2.7.3 Flow Nozzle

The basic principle of operation is the same as that of the Venturi meter. The flow nozzle has an entrance section and a throat, but lacks the diverging section of the Venturi meter. Flow nozzle accuracies can approach those of Venturi meters (9).

2.7.4 Electromagnetic Flow Meter

The electromagnetic flow meter operates according to Faraday's Law of Induction where the conductor is the liquid stream, and the field is produced by a set of electromagnetic coils. The accuracy of the device is within ± 1 percent of full scale (9).

2.7.5 Other Closed Conduit Devices

References for other closed conduit flow measurement methods such as acoustic flow meters, trajectory methods, pump curves, and water meters can be found in the EPA NPDES Compliance Inspection Manual (2).

3 Quality Assurance Procedures

The USDOI Water Measurement Manual (1), the USGS publication Discharge Measurements at Gaging Stations (8), the EPA NPDES Compliance Inspection Manual (2) and a set of weir and flume tables will be supplied to all field investigators. However, the measurements of wastewater flows require considerable experience.

Wastewater flow will be expressed in million gallons per day (mgd) or the metric equivalent (m^3/day). Time records associated with flow measurements will be kept in local time, will be made in the 2400 hour military time format, and will be recorded to the nearest five minutes. All flow measurements conducted will be documented in the field logbook for the event. All measurements will be traceable both to the individual making the measurements and the equipment utilized. All field equipment will be operated, calibrated, and maintained according to manufacturer's specifications. All equipment will be visually inspected prior to deployment to ensure proper operation.

3.1 Operational Check

A post-operation calibration check will be performed at the end of the flow measurement period according to manufacturer's specifications. It is also recommended that a calibration check be conducted at least once during the 24-hour flow measurement period, prior to the post-operation check.

4 Equipment

SESD flow measurement equipment is categorized as follows: water level/stage hardware and recorders, velocity measuring equipment and assemblies, and direct flow measurement equipment and instrumentation.

ISCO® Model 4210, 4220, and 4250 flow meters are used in conjunction with primary devices and are continuous recording systems. The Argonaut-SW® current flow meter is used to monitor current velocity and flow rates. The Argonaut-SW® can be installed in open channels and pipes without the use of primary devices. Flows in enclosed pipes can be measured using the Instruments Direct® F-100-902 Ultrasonic Doppler flow meter.

The following primary devices are available for installation: V-notch weir plates, rectangular weir plates, and a Parshall flume. Staff gages are available for direct instantaneous readings. Surveying levels and rods are available for use in calculating the head. The corresponding conversion of water level to flow rate can be accomplished instantaneously from stage/staff gage readings corresponding to the primary flow device in use, or by instantaneous readings of the available recording flow meter systems.

5 Records

Information generated or obtained by the field investigator will be organized and accounted for in accordance with the SESD Operating Procedure for Control of Records (SESDPROC-002). Field notes, recorded in a bound field logbook will be generated as documentation according to the procedures found in SESD Operating Procedure for Logbooks (SESDPROC-010).

: 13199

Communities for Clean Water

Communities for Clean Water

A Northern New Mexico Network

1 June 2015

Ms. Phyllis Bustamante, Acting Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87545

Re: Ground Water Discharge Permit No. DP-1132 (Los Alamos National Laboratory Radioactive Liquid Waste Treatment Facility)

Dear Ms. Bustamante:

Communities for Clean Water ("CCW") responds as follows to the proposed draft permit forwarded on May 21, 2015 to citizens participating in the comment process. Concerned Citizens for Nuclear Safety ("CCNS"), a member of CCW, has reviewed the comments and is in full agreement with them. Collectively, we have the following observations:

1. Electronic Public Reading Room ("EPRR") postings: Condition 49: CCW objects that all documents required to be submitted by the Permittees to the New Mexico Environment Department ("NMED"), and the NMED response, are not required to be posted to the EPRR. Under protest, we propose the following Mandatory and Voluntary Postings. [The list will be similar to comments we will submit on June 12, 2015 for the final draft permit, DP-1793]:

Mandatory Postings:

Notification of changes; NMED response

Plans and specifications; NMED response

Final construction report; NMED response

Secondary containment verification; NMED response

Actual or potential water tightness failure; NMED response

Containment; NMED response

Damage to structural integrity; NMED response

Freeboard; freeboard exceedence; exception request; NMED response

Effluent exceedence; NMED response

Emergency response procedures; NMED response

Report re installation and calibration of flow meters; NMED response

Soil moisture monitoring system exceedence; NMED response

Two alluvial groundwater wells replacement; NMED response

Monitoring well location; NMED response

Monitoring well construction; NMED response

Groundwater report re exceedence and correction; NMED response

Spill or unauthorized release; NMED response

Failure of discharge plan/discharge permit; NMED response

Report re stabilization of units; NMED response

Closure plan; NMED response

Final closure; NMED response

Postclosure groundwater monitoring; NMED response

Termination; NMED response

Voluntary postings:

Annual Update – due February 1 – includes summary of maintenance and repairs made during reporting period; water tightness testing results (VI.A.8); settled solids measurements and settled solids removal (VI.A.10); and groundwater flow report (VI.A.27).

Quarterly monitoring reports: Condition 24 – includes:

Monitoring and repair: Condition 13

Influent volumes LLW – Condition 25

Influent volumes TRU – Condition 26

Discharge volumes – Condition 27

Effluent sampling – Condition 29

Groundwater monitoring – Condition 36

2. Signage and entry restrictions: Conditions 5 and 6: At the April 16, 2015 meeting, Permittees said they would set up meetings with key CCW members to discuss and try to resolve signage and entry concerns, as well as emergency response procedures. No one representing the Permittees has contacted Kathy Sanchez or Marian Naranjo, respectively, on these subjects. This is a prime example of why communication with the Permittees must be made mandatory – as in postings of all documents submitted to NMED under this permit to the EPRR.

The new language in the draft is helpful, but the problem remains of the risks to persons on Pueblo de San Ildefonso land, where potential flows may disturb and transport contaminants. It is insufficient to post signs on "shared boundaries." CCW proposes that the Applicants simply supply a quantity of signs (say, 12) with wording in the appropriate dialect of Tewa and in English and the Pueblo authorities can place them in appropriate locations.

3. Water tightness testing: Condition 8: We welcome the change from 540 days to 180 days for water tightness demonstrations. In addition, at the meeting on April 16, 2015, we reiterated the need for the pipe connection between the Radioactive Liquid Waste Treatment Facility ("RLWTF") and the Solar Evaporative Tanks ("SET") to be double-walled. The draft permit does not respond to this proposal. CCW proposes that double containment be required in this important underground connection. Tritium-contaminated water will be transported in the pipeline. CCW has submitted extensive comments showing that DOE's own orders require secondary containment of pipelines. *See,* "Implementation Guide for use with DOE M 435.1-1, Chapter IV Low-Level Waste Requirements," IV.M.(2)(c), "Low-Level Waste Treatment and Storage Facility Design" and IV.M.(2)(e) "Monitoring." We do not understand why the pipeline was not designed for secondary containment. Settlement of the recent LANL fines could facilitate secondary containment of the pipeline. Further, CCW submits that the words "single-walled" should be inserted before "conveyance line from TA-50" into the description of the SET in section V.D. (p. 10) to accurately describe the SET.

4. Settled solids removal from SET, MES: Condition 10: Permittees have proposed new language, stating that the terms apply to the SET and Mechanical Evaporative System ("MES") "if applicable." CCW submits that these units will invariably be "open units and systems that are designed to store or dispose of a liquid or semi-liquid through evaporation," as described. Next, the draft permit contemplates submission of a plan to remove settled solids that exceed the permissible depth (or are

planned for removal) and a 120 day delay while the plan is reviewed. CCW submits that the settled solids should be removed as promptly as practicable, since the buildup may create risks of release of liquids. Some extended period of review may be needed the first time this process is carried out, but surely not every time thereafter. Permittees should now have a plan to remove solids from the SET and MES and should make it available as part of this permit process, since such removal is an inevitable part of operation. And the permit should call for removal of solids within 30 days after the identification of the problem and should allow an additional delay only if NMED makes a record that it needs time to review the plan.

5. Secondary containment verification: Condition 7: Similarly, CCW believes that 180 days following the effective date of the permit is too long for the Permittees to verify secondary containment.

6. Maintenance and repair and structural integrity damage: Conditions 13 and 14: The new draft attempts, correctly, to direct the process of remediation more specifically, here requiring a written corrective action plan. CCW questions whether a delay of 90 days before such a plan is submitted is appropriate, since the necessary action may be obvious. Thirty days is more appropriate, with an extension available for good cause. Moreover, by hypothesis the detected problem is at least potentially dangerous, and the condition should state that the equipment should normally be taken out of service, unless the Permittees can show that the damage is very unlikely to cause an actual risk before it can be repaired. In addition, equipment should be required to be maintained in accordance with manufacturer's specifications.

7. Effluent exceedence: Condition 18: Subpart (b) should state whether the notification to NMED GWQB is required to be oral and/or written.

8. Emergency response procedures: Condition 20: The discussion on site underscored the distinction between emergencies requiring action by RLWTF staff and those requiring involvement of outside, usually first responder, personnel. The new text says that the Incident Command System ("ICS") is used in response to all emergencies. ICS should be made a defined term and regulatory or other specific citations provided.

The new language appears to state that the emergency response procedures will follow the structure of the ICS and will be made available to the public. Under the ICS, procedures are pre-established and sanctioned by participating authorities. Since in any significant emergency, the authorities from one or more nearby pueblos will necessarily participate in the response, it is implied that such pueblos will be incorporated into the ICS structure and thus informed of any emergency affecting such pueblos and incorporated into the response by prior agreement. Please confirm this understanding. Further, CCW supports an annual review of the emergency response procedures. The emergency response procedures should address any exceedences of effluent limits and should state a time limit for remediation of violations.

9. Installation and calibration of flow meters: Conditions 21, 22: The new draft permit states that flow meters are to be installed within 180 days of the effective date of the permit. It has not been explained why it might take six months to install four meters, which are basically off-the-shelf gaging devices. These meters are almost the only guaranty that the basic flow processes of the RLWTF are operating as designed. They should be installed promptly; 30 days is not unreasonable.

We also see that the new draft allows meter operation within plus or minus 10% of actual flow. Since the meters are important components of the oversight of RLWTF's operation, and since much closer tolerances are entirely feasible, it is not correct to attempt to justify a needlessly broad range of variability based on asserted undated NMED "policy." In comments to various iterations of the draft permit, including on November 14, 2014, CCW has provided information that ISO 17025-certified meters can achieve +/-0.05 percent accuracy" and "measuring uncertainties of +/- 0.1% of rate are achievable with modern flowmeters." We do not understand why calibration rates of 100 to 200 times greater are considered appropriate in the draft permit. Further, CCW submits that the single-walled conveyance from the RLWTF to the SET should have flow meters at both ends of the pipe. And, learning from the recent Santa Barbara oil spill, a shutoff valve should be installed at the beginning of the pipeline – as shown in the SET engineering drawings.

10. Waste tracking: Condition 28: We probably do not have a difference in principle about the waste tracking records, but CCW does think the language proposed by Permittees is somewhat confusing. The basic question in the background is: Are the required records to be forward-looking, thus, to show the quantities of wastes that are authorized to be received and planned to be disposed, or are they backward-looking and, thus, to show the quantities of wastes that were actually received and were disposed of over (say) a given year? We suggest that it is more important for regulatory purposes to show the historical data. Thus, we would take the language in the draft permit and add "current" in the first line after "maintain," in (b) say "time period for which the Permittees approved," in (d) say "days per year discharge occurred" and "each year when

discharge occurred." In the second new paragraph, say "Permittees shall also maintain" and refer to "records of all waste streams conveyed from the facility, including but not limited to: Radioactive Liquid Waste Bottoms . . ."

11. Soil moisture monitoring: Conditions 30-31: We think it essential to establish scientific baseline conditions under the SET before it receives any water. Under the draft permit, that is possible but not assured. CCW requests that the initial monitoring data be taken before the SET is used for waste. In the alternative, the permit should prohibit use of the SET until the baseline conditions are established. Second, the permit should specify distinct criteria for the establishment of an action level. The permit should define the action level. We submit that the action level should be based upon (a) sensitivity of the monitoring equipment, (b) observed seasonal variation, such that the action level may vary with different seasons, (c), placement of sensors in space, (d) rate of change in moisture levels, (e) the observable impact of a 100 and a 500 gallon leak, (f) observable changes in the shape of a plume, and (g) depth of observed moisture. Further, the quarterly monitoring events and maintenance or repair of the soil moisture monitoring system should be required to be reported quarterly. CCW also questions why the Permittees have 15 days following discovery of a soil moisture increase beneath the SET to notify NMED. Oral and/or written notification should be made within 24 hours. CCW is concerned about providing a lengthy 60 days for the Permittees to identify the source; plus another 30 days if the exceedence is demonstrated to be associated with a leak from or breach of the SET. In the event that the exceedence is not associated with a failure of the SET, the Permittees have 120 days to submit a corrective action plan. These periods are too lengthy to promptly address a leak. Lastly, to provide transparency about the data

from the soil moisture monitoring, the quarterly results should be required to be included in the quarterly monitoring reports.

12. Ground water wells and monitoring: Conditions 32-36: Some improvements in the draft permit are needed: Some existing wells have extended screens. Thus, in Condition 34, the permit should state in the first sentence, "hydrologically downgradient in the stratum it is intended to monitor from the potential or actual discharge location it is intended to monitor . . ." There are other concerns. Condition 35 authorizes NMED to require a replacement well, but the authority is limited to instances where the existing monitoring well has "insufficient water" or is "not completed in a manner that is protective of ground water quality." However, a monitoring well may need replacement for other reasons, such as contamination by drilling chemistry or other defects in its construction. NMED must not be unduly limited in its authority to call for a new well.

13. Ground water wells: replacement of two existing wells: Condition 33. The title should include the word "Alluvial."

14. Ground water exceedences: Condition 37: This new condition correctly addresses any exceedence of a ground water quality standard or presence of a toxic pollutant. Nevertheless, CCW questions why the permit places the burden on the NMED to determine if there is an exceedence. CCW submits that the permit should require the Permittees to report an exceedence to NMED clearly in the cover letter forwarding the ground water investigation/source control workplan. NMED identified the need for such requirement when the Permittees buried chromium exceedences in report tables without specifically stating exceedences in the cover letter. As a result, NMED took

administrative action and fined the Permittees. As part of the settlement, specific reporting requirements mandate notification in the cover letter to NMED of any exceedences.

15. Spill or unauthorized release: Condition 38: This Condition is parallel to Condition 37. Under the draft, Conditions 37 and 38 may overlap, since Condition 37 is not excluded by the "other than" language in Condition 38. Neither is "spill" or "release" a defined term. The difficulty is that Condition 38 requires the Permittees to submit a corrective action report and plan within 15 days of discovery of the release, whereas Condition 37 allows the Permittees to await a notification from NMED and then submit an investigation/source control work plan within 60 days. While different releases of toxic pollutants may present different levels of urgency, it should be NMED's decision, not the Permittees', at which level of urgency to place a given event. Conditions 37 and 38 should be combined, swift initial reporting should be required, and NMED should set the schedule for subsequent actions.

16. Operation cessation of specific units: Condition 40: CCW submits that this condition should include requirements for the Permittees to notify NMED orally and/or in writing within 24 hours if the 75K tank is used for emergency storage and include that information in the quarterly monitoring report.

17. Stabilization of individual units and systems: Condition 41: Under the draft permit, the five units listed in Condition 41 would cease operations 60 days after the permit issues and the Permittees would submit a work plan to stabilize these units within 120 days after ceasing operations—i.e., 180 days after the permit issues. For comparison, Condition 42 would require the Permittees to submit their closure plan within 180 days of

the issuance of the permit. The "stabilization" plan and the "closure" plan can be expected to follow similar principles. These plans will raise similar novel and difficult issues as to the methods to close sites that are located in a highly developed location, monitoring methods in such locations, and permissible future uses. CCW submits that these important issues should be addressed as part of the permitting process and not as a follow-on action, occurring without effective public comment and participation.

18. Closure plan: Condition 42: As stated above, CCW does not agree that the Closure Plan is not part of the draft permit and subject to public hearing. The draft permit should state expressly that NMED will issue public notice about the public comment period, pursuant to 20.6.2.3108 NMAC.

19. Integration with Consent Order: Condition 46: This new provision states that the investigation, characterization, cleanup, and corrective action at the site of the RLWTF shall be conducted solely under the Consent Order and not under the permit. Given that many critical actions, if taken under the discharge permit, may have no public participation, it seems correct to conduct them under the Consent Order. We note that SWMU 50-001(a), SWMU 50-002(a), Consolidated SWMU 50-002(b) and AOC 50-001(b) will not be investigated under the Consent Order until after decommissioning of the RLWTF. *Corrected ENV-DO-14-0229, Request for Additional Information, Discharge Permit Application DP-1132, Radioactive Liquid Waste Treatment Facility,* ENV-DO-14-0247, LA-UR-14-26444, September 11, 2014.

20. Description of MES. V.D. (p.10). CCW submits that the description of the MES should include the facility numbers for the units, as provided in the SET description.

21. Quarterly reports. A new condition should be added that lists all of the information that is required throughout the permit to be submitted in the quarterly reports to NMED, similar to that provided in Condition 1 for the annual report. *See* list in Comment No. 1.

22. Correction to Permittees' May 20, 2015 cover letter: "CCW" is the acronym for "Communities for Clean Water" – not "Citizens for Clean Water." Jonathan Block represents CCNS, Lindsay Lovejoy represents CCW.

We thank you for your consideration of these comments and look forward to your action thereon.

Very truly yours,

/s/ Lindsay A. Lovejoy, Jr.

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13212

NPDES PERMIT NO. NM0028355
FACT SHEET

FOR THE DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

APPLICANT

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Los Alamos National Laboratory
PO Box 1663, K491
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AND

U.S. Department of Energy
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DATE PREPARED

June 26, 2013

PERMIT ACTION

Proposed reissuance of the expired permit issued with an effective date of August 1, 2007, and an expiration date of July 31, 2012. The permit was re-applied for timely and was therefore subsequently administratively continued.

RECEIVING WATER – BASIN

Rio Grande (see details below) – Segment No. 20.6.4.126/128 of the Rio Grande Basin

DOCUMENT ABBREVIATIONS

In the document that follows, various abbreviations are used. They are as follows:

4Q3	Lowest four-day average flow rate expected to occur once every three-years
BAT	Best available technology economically achievable
BCT	Best conventional pollutant control technology
BPT	Best practicable control technology currently available
BMP	Best management plan
BOD	Biochemical oxygen demand (five-day unless noted otherwise)
BPJ	Best professional judgment
CBOD	Carbonaceous biochemical oxygen demand (five-day unless noted otherwise)
CD	Critical dilution
CFR	Code of Federal Regulations
cfs	Cubic feet per second
COD	Chemical oxygen demand
COE	United States Corp of Engineers
CWA	Clean Water Act
DMR	Discharge monitoring report
ELG	Effluent limitation guidelines
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FCB	Fecal coliform bacteria
F&WS	United States Fish and Wildlife Service
mg/l	Milligrams per liter (one part per million)
ug/l	Micrograms per litter (one part per billion)
MGD	Million gallons per day
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMIP	New Mexico NPDES Permit Implementation Procedures
NMWQS	New Mexico State Standards for Interstate and Intrastate Surface Waters
NPDES	National Pollutant Discharge Elimination System
MQL	Minimum quantification level
O&G	Oil and grease
POTW	Publically owned treatment works
RP	Reasonable potential
SIC	Standard industrial classification
s.u.	Standard units (for parameter pH)
SWQB	Surface Water Quality Bureau
TDS	Total dissolved solids
TMDL	Total maximum daily load
TRC	Total residual chlorine
TSS	Total suspended solids
UAA	Use attainability analysis
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Service
WLA	Wasteload allocation
WET	Whole effluent toxicity
WQCC	New Mexico Water Quality Control Commission

WQMP Water Quality Management Plan
WWTP Wastewater treatment plant

STATE CERTIFICATION: The permit is in the process of certification by the State agency following regulations promulgated at 40 CFR124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service; and to the National Marine Fisheries Service prior to the publication of that notice.

TRIBAL CERTIFICATION: Several Pueblos are located in the vicinity of Los Alamos National Laboratory. They include the following: San Ildefonso, Santa Clara, and Cochiti. The Santa Clara Pueblo has approved water quality standards (WQS); however, it is not adjacent to any stream where discharges are proposed to be authorized. Santa Clara is therefore not believed to be affected by the discharges proposed to be authorized by this permit. Neither San Ildefonso nor Cochiti Pueblo has submitted WQS for approval at this time; therefore, the only 401 certification is required from the State of New Mexico. However, pursuant to EPA's Tribal Consultation Policy, EPA offered, in letters of January 10, 2013, to San Ildefonso and Cochiti Pueblos, respectively, the opportunity to engage in government-to-government consultation because they are located downstream of the facility's discharges.

ENDANGERED SPECIES ACT: In accordance with requirements under section 7(a)(2) of the Endangered Species Act, EPA has reviewed this permit for its effect on listed threatened and endangered species and designated critical habitat. According to the most recent county listing of species, for the State of New Mexico revised as of 2012, the following species are listed in the county where the proposed NPDES discharge occurs: black-footed ferret (*Mustela nigripes*), southwestern willow flycatcher (*Empidonax traillii extimus*), and Mexican spotted owl (*Strix occidentalis lucida*). Bald eagle (*Haliaeetus leucocephalus*) is delisted since prior issuance of the permit in 2007. No other changes have been made to the US Fish and Wildlife list of threatened and endangered species and critical habitat designation in the area of the discharge since prior issuance of the permit.

During the re-issuance of this permit in 2000, EPA conducted informal consultation with the US Fish and Wildlife Service (the FWS or the Service) (Cons. #2-22-01-I-018). That consultation was concluded on December 7, 2000 with the Service concurring by letter with EPA's determination that the re-issuance of the NPDES permit for LANL would have "no effect" on Mexican spotted owl and "may affect, not likely to adversely affect" on the bald eagle and southwestern willow flycatcher. The FWS also found that black-footed ferret was not present in the permit action area.

The FWS concluded in the 2000 consultation letter: "Based on information in the BE (Biological Evaluation), the Service believes that the reissued permit should slightly improve effluent water quality at LANL over the 5-year permit. In addition, re-issuance of the NPDES permit will not measurably alter stream morphology, flow patterns, temperatures, water chemistry, or slit loads in any of the affected intermittent tributaries or the Rio Grande. Therefore, the Service concurs with the EPA determination that the re-issuance of the NPDES permit for LANL will have "no effect" on the Mexican spotted owl, and "may affect, not likely to adversely affect" the bald eagle and southwestern willow flycatcher."

EPA determined, when re-issuing the permit in 2007, that the re-issuance of Permit No. NM0028355 would not alter the environmental baseline; therefore, the 2007 action had "no effect" upon the previous consultation baseline on listed threatened and endangered species and it would not adversely modify designated critical habitat. EPA believes that the conclusion statements made by the FWS in 2000 and EPA's determination made in 2007 are still true for this NPDES permit renewal action. There are changes of permit conditions and those changes are either because of the cessations of discharges or because of no reasonable potential of existing discharges to cause exceedances of WQS. Information available does not indicate increases of total discharge loads or additions of new pollutants which may cause adverse environmental impacts. EPA determines that this action results in no significant change to the environmental baseline (except for the removal of bald eagle from the federal endangered species list and reduction of discharge outfalls) established by the consultation conducted during previous issuance of the permit; therefore, EPA concludes that this re-issuance of the permit will not cause change to EPA's previous determination as well as the FWS's conclusions made during the 2000 consultation. EPA determines that this permitting action has "no effect" on the 2000 consultation baseline for willow flycatcher.

<u>FINAL DETERMINATION</u>: The public notice describes the procedures for the formulation of final determinations.

I. CHANGES FROM THE PREVIOUS PERMIT

Significant changes from the permit previously issued June 8, 2007, with an effective date of August 1, 2007, and an expiration date of July 31, 2012, are:

A. Eliminate six Outfalls 02A129, 03A021, 03A028, 03A130, 03A158, and 03A185;
B. Delete Water Quality-based effluent limitations (WQBEL) for aluminum at Outfall 001;
C. Establish WQBEL for copper and zinc based on 50 mg/l of hardness and set hardness limitation of >= 50 mg/l at Outfall 051;
D. Delete WQBEL and total phosphorus limit at Outfall 03A022;
E. Delete all WQBEL, except for TRC, at Outfalls 03A027, 03A113, 03A181, and 03A199;
F. Establish WQBEL for arsenic and selenium at Outfall 03A048;
G. Add WQBEL for arsenic and cyanide at Outfall 03A160;
H. Add WQBEL for selenium and cyanide at Outfall 03A199;
I. Establish new critical dilutions at Outfalls 03A027 and 03A199;
J. Delete Whole Effluent Toxicity (WET) testing requirements for Outfalls 03A048, 03A113, 03A160, and 03A181;
K. Establish WET limit at Outfall 051; and
L. Change sampling location of Outfall 13S.

II. APPLICANT LOCATION AND ACTIVITY

Under the Standard Industrial Classification (SIC) Codes 9922, 9711, 9661, and 9611, the applicant currently operates a large multi-disciplinary facility which conducts national defense research and development, scientific research, space research and technology development, and energy development.

As described in the application, the plant site is located in Los Alamos County, New Mexico. The discharges are to receiving waters consisting of various tributaries in Waterbody Segment Code No. 20.6.4.126 and 20.6.4.128 of the Rio Grande Basin. Those discharges are:

Tech. Area	Outfall Number	Receiving Stream
3-22	001	Sandia Canyon
3-66	03A022	Mortandad Canyon
3-2327	03A027	Sandia Canyon
53-963, -964 -978, -979	03A048	Los Alamos Canyon
53-293, -952, -1032, SW	03A113	Sandia Canyon
35-124, -595	03A160	Ten Site Canyon
55-6	03A181	Mortandad Canyon
3-1837	03A199	Tributary to Sandia Canyon
16-1508	05A055	Canon de Valle
50-1	051	Mortandad Canyon
46-347	13S	Canada del Buey

There have been no discharges at Outfall 05A055 since November 2007 and at Outfall 051 since November 2010. The facility plans to eliminate four more outfalls (i.e., Outfalls 03A027, 03A160, 03A181, and 03A199) over the next 2 to 5 years.

Outfall Type	Category (detailed descriptions of sources of discharges are provided in the application)
001	Power plant discharge and re-used treated sanitary wastewater
03A	Cooling tower blowdown, evaporative coolers, chillers, condensers, and air washer blowdown
05A	High explosive waste water discharge
051	Industrial and radioactive wastewater treatment plant
13S	Sanitary wastewater

III. EFFLUENT CHARACTERISTICS

A quantitative description of each discharge is presented in the EPA Permit Application Form 2C dated January 27, 2012. The maximum monthly flow and pollutants which were detected and reported above EPA defined minimum quantification levels (MQLs) at each outfall are used for the reasonable potential (RP) analysis.

IV. REGULATORY AUTHORITY/PERMIT ACTION

In November 1972, Congress passed the Federal Water Pollution Control Act establishing the NPDES permit program to control water pollution. These amendments established technology-based or end-of-pipe control mechanisms and an interim goal to achieve "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water," more commonly known as the "swimmable, fishable" goal. Further amendments in 1977 of the CWA gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry and established the basic structure for regulating pollutants discharges into the waters of the United States. In addition, it made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions. Regulations governing the EPA administered NPDES permit program are generally found at 40 CFR §122 (program requirements & permit conditions), §124 (procedures for decision making), §125 (technology-based standards) and §136 (analytical procedures). Other parts of 40 CFR provide guidance for specific activities and may be used in this document as required.

It is proposed that this permit be reissued for a 5-year term following regulations promulgated at 40 CFR §122.46(a).

V. DRAFT PERMIT RATIONALE AND PROPOSED PERMIT CONDITIONS

A. OVERVIEW OF TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Regulations contained in 40 CFR §122.44 requires that NPDES permit limits are developed that meet the more stringent of either technology-based effluent limitation guidelines, numerical and/or narrative water quality standard-based effluent limits, or the previous permit.

B. TECHNOLOGY-BASED EFFLUENT LIMITATIONS/CONDITIONS

Regulations promulgated at 40 CFR §122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on ELGs where applicable, on BPJ in the absence of guidelines, or on a combination of the two. In the absence of promulgated guidelines for the discharge, permit conditions may be established using BPJ procedures. EPA establishes limitations based on the following technology-based controls: BPT, BCT, and BAT. These levels of treatment are:

BPT - The first level of technology-based standards generally based on the average of the best existing performance facilities within an industrial category or subcategory.

BCT - Technology-based standard for the discharge from existing industrial point sources of conventional pollutants which may include BOD, TSS, pH, and O&G.

BAT - The most appropriate means available on a national basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters. BAT effluent limits represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Following are the summary of the BPJ-based limitations included in the administratively continued permit and EPA proposes to retain them in the permit:

Outfall 001 (Power Plant Effluent and re-used Treated Sanitary Wastewater) - Based on ELG for low volume waste discharge at electric steam power plants in 40 CFR 423.

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l

Outfall Type 03A (Treated Cooling Water) - Based on ELG for low volume waste discharge at electric steam power plants in 40 CFR 423.

	Monthly Average	Daily Maximum
Total Suspended Solids	30 mg/l	100 mg/l
Total Phosphorus	20 mg/l	40 mg/l
pH	Range from 6.0 to 9.0 standard units	

(More stringent WQ-based pH applies to direct discharge outfalls if applicable)

Outfall 05A055 (High Explosives Waste Water) – Total toxic organics (TTO) were based on ELG for metal finishing (40 CFR 433.11), TNT was based on permit limit established for the Pantex plant, and RDX was based on LANL effluent data. All these BPJ-based limitations were established in 2000 issued permit.

	Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Oil & Grease	15 mg/l	15 mg/l
Total Toxic Organics	1.0 mg/l	1.0 mg/l
Trinitrotoluene	20 µg/l	Report
Total RDX	200 µg/l	660 µg/l
Perchlorate	Report	Report
pH	Range from 6.0 to 9.0 standard units	

Outfall 051 (Radioactive and Industrial Waste Water) – TTO was based on 40 CFR 433.11.

	Monthly Average	Daily Maximum
Chemical Oxygen Demand	125 mg/l	125 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
Total Toxic Organics	1.0 mg/l	1.0 mg/l
Total Chromium	1.34 mg/l	2.68 mg/l
Total Lead	0.423 mg/l	0.524 mg/l
Perchlorate	Report	Report
pH	Range from 6.0 to 9.0 standard units	

Outfall 13S (Sanitary Waste Water) – Based on the ELG for secondary treatment in 40 CFR 133.

	Monthly Average	Daily Maximum
Biochemical Oxygen Demand	30 mg/l	45 mg/l
Total Suspended Solids	30 mg/l	45 mg/l
pH	Range from 6.0 to 9.0 standard units	

The administratively continued permit contains mass limits at Outfalls 13S based on a long term average flow of 0.298 MGD and a projected flow of 0.318 MGD to cover increased flow due to a residential subdivision sewer line tie-in project. Because the sewer line tie-in project was cancelled, the mass load limitations are recalculated based on the new long term average flow of 0.29 MGD. The new monthly average and daily maximum loadings are 73 and 109 lb/day, respectively.

The permittee requested to change the sampling location from a point after the chlorine contact chamber to the flow measuring device in Canada del Buey because treated water will be conveyed to a sanitary reclamation recycling facility (SERF) and therefore no discharge occurs unless discharge is made directly to Canada del Buey. EPA determines that monitoring and sampling are not required for wastewater to be further treated and reused for other process, so proposes to change the sampling location to the flow measuring device in Canada del Buey in case discharge is made to Canada del Buey.

C. WATER QUALITY BASED LIMITATIONS

1. General Comments

Water quality based requirements are necessary where effluent limits more stringent than technology-based limits are necessary to maintain or achieve federal or state water quality limits. Under Section 301(b)(1)(C) of the CWA, discharges are subject to effluent limitations based on federal or state WQS. Effluent limitations and/or conditions established in the draft permit are in compliance with applicable State WQS and applicable State water quality management plans to assure that surface WQS of the receiving waters are protected and maintained, or attained.

2. Implementation

The NPDES permits contain technology-based effluent limitations reflecting the best controls available. Where these technology-based permit limits do not protect water quality or the designated uses, additional water quality-based effluent limitations and/or conditions are included in the NPDES permits. State narrative and numerical water quality standards are used in conjunction with EPA criteria and other available toxicity information to determine the adequacy of technology-based permit limits and the need for additional water quality-based controls.

3. State Water Quality Standards

The general and specific stream standards are provided in NMWQS (20.6.4 NMAC amended through November 20, 2012). EPA approved three hardness-dependent metal criteria, aluminum, cadmium, and zinc on April 30, 2012. Therefore, new criteria were used for RP screening. The facility discharges into varied canyons in Segment No. 20.6.4.126 or 20.6.4.128 of the Rio Grande Basin. The designated uses of the receiving water are described below:

20.6.4.126 Rio Grande Basin - Perennial portion of ... Sandia canyon from Sigma canyon upstream to LANL NPDES outfall 001, ...

(A) Designated Uses: coldwater aquatic life, livestock watering, wildlife habitat and secondary contact.

20.6.4.128 Rio Grande Basin - Ephemeral and intermitten portions of watercourses within lands managed by U.S. department of energy (DOE) within LANL, including but not limited to: Mortandad canyon, Canada del Buey, Ancho canyon, Chaquehui canyon, Indio canyon, Fence canyon, Potrillo canyon and portions of Canon de Valle, Los Alamos canyon, Sandia canyon, Pajarito canyon and Water canyon not specifically identified in 20.6.4.126 NMAC.

(A) Designated Uses: livestock watering, wildlife habitat, limited aquatic life and secondary contact.

Water quality standards of chronic aquatic life and non-persistent human health do not apply to segment number 20.6.4.128.

As described earlier in this Fact Sheet, Los Alamos National Laboratory discharges to Sandia Canyon, Los Alamos Canyon, Mortandad Canyon, Canon de Valle, and Ten Site Canyon. The facility's discharges, most of which are intermittent in nature, are located from 6.9 to 10.4 miles from the Rio Grande. All of the receiving streams are ephemeral or intermittent in nature and do not generally reach the Rio Grande, except as the result of precipitation events. The State standards for livestock watering, wildlife habitat, acute aquatic life and general WQS apply to the proposed discharges. Chronic aquatic life criteria could be applied at Outfall 001 because the effluent creates a perennial portion within Sandia Canyon which is designated also for cold aquatic life use. Discharges from Outfalls 03A027 and 03A199 which are located at downstream from Outfall 001 will reach the perennial portion of Sandia Canyon, so chronic aquatic life standards also apply. For discharges into receiving streams in segment number 20.6.4.128 which are either ephemeral or intermittent in nature, no in-stream dilution is used to calculate either the in-stream waste concentrations (IWCs) or the proposed limits. All WQ-based limits in the segment number 20.6.4.128 were calculated based on 100% effluent. For discharges at Outfalls 03A027 and 03A199, the long-term average effluent flow at Outfall 001 was used to calculate critical dilution for discharges from Outfalls 03A027 and 03A199 against chronic criteria because Outfall 001 effluent is the upstream flow of these two outfalls. However, because the discharge at Outfall 03A199 is to a stormwater drain prior to reaching Sandia Canyon, an additional RP was conducted against WQS for 20.6.4.128 waterbody. A statistical multiplier of 2.13, pursuant to NM Implementation Guidance, was applied to effluent data and the data were screened against water quality standards to determine whether the discharge has a reasonable potential (RP) to exceed the applicable water quality standards. Each effluent hardness value (except for Outfalls 03A027 and 03A199 at Sandia Canyon) was used to calculate the hardness-dependent standards. The hardness and TSS values of Outfall 001 effluent were used to calculate the RP for discharges at Outfalls 03A027 and 03A199. Because cooling tower blowdown has not been discharged at Outfall 03A022 since November 2011 and the effluent analytical results reported in the Form 2C were based on a sample taken when blowdown still discharged at that outfall, EPA decided not to conduct a RP screening for Outfall 03A022 based on effluent data no longer representative of the actual discharge from this outfall. Copper and TRC were the only two WQBEL established for Outfall 03A022 in the administratively continued permit. Because copper concentrations were reported below both effluent limitations and MQL for copper, and chlorine would not likely be used for storm runoffs, EPA is not requiring storm runoff data to conduct RP for this permit term. The Table below lists stream low flows, hardness and TSS values used for RP analysis.

Outfall Number	Effluent Flow (MGD)	Hardness (mg/l)	TSS (mg/l)	4Q3 Low Flow (cfs)
001	0.357	78.8	1.08	0.0
13S	0.29	102	2.17	0.0
03A027	0.102	78.8	1.08	0.55
03A048	0.104	179	1.0	0.0
03A113	0.09	167	1.8	0.0
03A160	0.002	118	1.0	0.0
03A181	0.0094	84.7	1.0	0.0
03A199 at the point of discharge	0.0395	122	4.3	0.0
03A199 at the point reaches Sandia Canyon	0.0395	78.8	1.08	0.55

4. Effluent Limitations

Effluent data from each outfall reported in Form 2C were screened against the current EPA approved NM WQS. Spread sheets used to calculate the reasonable potential can be found in the Appendix to this Fact Sheet. The initial screening results show that the following discharges have RP to exceed the WQS for the designated uses in 20.6.4.128:

Outfall No.	Parameters
03A048	Arsenic and Selenium
03A160	Arsenic, Copper and Cyanide
03A199	Selenium and Cyanide

Total Residual Chlorine (TRC) - Although only one outfall (Outfall 03A048) has reported TRC at detectable amounts, effluent limitations and monitoring requirements for TRC at administratively continued permit are retained because discharges would have potentials to exceed water quality standards for TRC when chlorine products are used for disinfection or algae control. However, because the effluent limitations and monitoring requirements for TRC are based on the permit writer's discretionary rather than RP, EPA determines to retain the existing monitoring frequency of 1/week, rather than the monitoring frequency recommended in the NMIP, at all applicable outfalls. In accordance with the NMIP, the permit writer may establish a case-by-case monitoring frequency based on the following factors: (1) the type of treatment process, including retention time; (2) environmental significance and nature of the pollutant or pollutant parameter; (3) cost of monitoring relative to the discharger's capabilities and benefit obtained; (4) Compliance history; (5) number of monthly samples used in developing the permit limit; and (6) effluent variability. The TRC applies to Outfall 13S only when discharge is made directly to Canada del Buey through the alternate discharge point.

E. coli - Monitoring requirements and effluent limitations apply at Outfalls 001, 13S, or 03A027 where final treated sanitary wastewater actually discharges. The monitoring frequency is 2/month based on the frequency recommended in the NMIP for a municipal facility with activated sludge technology and a design flow of $0.1 \leq 0.5$ MGD.

Outfall 001 - EPA approved new standards for hardness-dependent total aluminum on April 30, 2012, and the discharge has demonstrated no RP to exceed new standards. Therefore, the effluent limitations and monitoring requirements for aluminum in the administratively continued permit will be deleted from Outfall 001.

Outfall 03A022 - Because cooling tower blowdown has no longer been discharged at Outfall 03A022 but may only discharges emergency use potable cooling water from circulating tank and storm water from roof drain, all existing WQ-based limitations and BPJ-based phosphorus limitations in the administratively continued permit are proposed to be removed. Cooling tower blowdown is not authorized for discharge at this outfall.

Outfall 03A048 - Because the discharge at Outfall 03A048 has RP to cause or contribute to a water quality violation for arsenic and selenium, site-specific effluent limitations are established at the outfall. Limitations for selenium are based on wildlife habitat standards and limitations for arsenic are based on human health standard. EPA used the default non-zero harmonic mean flow of 0.001 MGD recommended by NMED to determine the RP for human health-based pollutants. The permittee may provide data to support a different "modified harmonic mean flow" as defined in the provision of 20.6.4.11 of the NMWQS. Because discharges at this outfall flow to an ephemeral/intermittent stream which does not support a drinking water use and also is unlikely to provide adequate habitat for fish propagation or growth, discharges to this stream would have limited on human health. EPA, on a case-by-case discretionary, proposes 1/year monitoring frequency for arsenic. However, selenium may affect wildlife downstream the outfall whenever there are discharges, EPA proposes 3/week monitoring frequency when discharge occurs.

Outfall 03A160 - Because the discharge at Outfall 03A160 has RP to cause or contribute to a violation for arsenic, copper, and cyanide, site-specific effluent limitations are established at this outfall. Limitations for copper are based on acute aquatic life standard, for cyanide are based on wildlife habitat standard and for arsenic are based on human health standard. EPA used the default non-zero harmonic mean flow of 0.001 MGD recommended by NMED to determine the RP for human health-based pollutants. The permittee may provide data to support a different "modified harmonic mean flow" as defined in the provision of 20.6.4.11 of the NMWQS. Because discharges at this outfall flow to an ephemeral/intermittent stream which does not support a drinking water use and also is unlikely to provide adequate habitat for fish propagation or growth, discharges to this stream would have limited on human health. EPA, on a case-by-case discretionary, proposes 1/year monitoring frequency for arsenic. However, copper and cyanide may affect aquatic life or wildlife around the outfall whenever discharges occur. EPA proposes 3/week monitoring frequency for copper and cyanide when discharge occurs.

Outfall 03A199 - Because the discharge at Outfall 03A199 has RP to cause or contribute to a violation for selenium and cyanide, site-specific effluent limitations are established at this outfall. Limitations for selenium and cyanide are based on wildlife habitat standard, and discharges may affect wildlife around the outfall whenever discharges occur. EPA proposes 3/week monitoring frequency for selenium and cyanide when discharge occurs.

Outfalls 03A027, 03A113, and 03A181 - Because discharges at these outfalls demonstrated no RP, WQ-based effluent limitations are not proposed and any WQ-based effluent limitations (except for TRC as described above) in the administratively continued permit are discontinued at these outfalls. Effluent limitations and monitoring requirements for E. coli apply if treated sanitary wastewater discharged at Outfall 03A027 or any other outfalls.

Outfalls 051 - The effluent is evaporated through a mechanical evaporator and has no discharge since November 2010. The facility includes the outfall in the application in case the evaporator becomes unavailable due to maintenance, malfunction, and/or capacity shortage. The facility did not include effluent characteristics in the application. The facility requests to modify the process to adjust the effluent hardness so the discharge has the same hardness value of 50 mg/l as the influent has because the filtration and reverse osmosis treatment systems have caused low hardness in the effluent. LANL stated that low hardness in the effluent makes the discharge fail the WET test and effluent limitations for copper and zinc in the administratively continued permit are unattainable low. Both copper and zinc WQS are hardness-dependent and the copper and zinc limitations in the administratively continued permit were derived based on a near-zero low hardness value. Like pH adjustment, because the adjustment of hardness will make the effluent more suitable for aquatic life habitat, EPA proposes new effluent limitations for hardness-dependent metals based on adjusted effluent hardness. Effluent data showed that TSS concentrations in discharges were below 1 mg/l. Based on the 50 mg/l of hardness and 1 mg/l of TSS, the calculated total copper WQS is 14.3 μg/l and zinc is 191 μg/l. EPA proposes to establish water quality standards as effluent limitations for copper (0.014 mg/l Daily Max and Monthly Avg) and zinc (0.191 mg/l Daily Max and Monthly Avg). EPA also proposes to retain all other monitoring requirements for toxic pollutants in the permit and require LANL to take at least two samples per term from different discharge events for representative effluent characteristic analyses if discharges occur, so EPA may conduct RP screenings based on true effluent data. Because the effluent with a greater hardness will cause less toxicity to aquatic life, a hardness limitation of 50 mg/l or greater is established to ensure the effluent has a hardness value not less than 50 mg/l. Monitoring frequency for copper and zinc are increased from 1/month to 3/week when discharges occur.

Outfall 05A055 – There has been no discharge from the High Explosive Wastewater Treatment Facility (HEWTF) at Outfall 05A055 since November 2007. Normal operations since November 2007 have utilized the electric evaporator and eliminated the discharge. The applicant intends to continue to operate the HEWTF using the evaporator except under abnormal conditions (i.e., malfunction of the evaporator). There was no WQ-based effluent limitation established in the administratively continued permit and no change is proposed for this renewal action.

PCBs – The administratively continued permit has PCB effluent limitations and monitoring requirements at Outfall 001 and at Outfall 13S (if a direct discharge occurred at Outfall 13S), and monitoring and reporting only requirements at Outfall 051. The administratively continued permit restricts re-route, reuse, or discharge of PCB contaminated effluent at other outfalls, except at Outfall 001 or Outfall 13S. In order to avoid hindering any process or technology which could be considered for either PCB clean-up, PCB removal, water reuse or future discharge reduction, EPA determines not to include such restrictions in the proposed permit. If circumstances arise in which PCB contained effluent discharges at different outfalls, the same PCB effluent limitations and monitoring requirements established at Outfall 001 will apply to those outfalls unless the permit is modified to establish a site-specific limitation based on new discharge and/or stream flow data.

Since there have been no discharges at Outfall 13S and Outfall 051, monitoring data are not available for evaluation at those two outfalls. Effluent data from 2008 to 2011 indicated that discharges at Outfall 001 exceeded the interim monthly average limitation of 0.009 μg/l in 2009, and all data exceeded the final limitation (to be effective on July 30, 2012) of 0.000640 μg/l. Information provided by the applicant indicated that PCB analytical results from the October 23, 2012 sample was 0.000565 μg/l.

LANL requested removal of the requirement to use Method 1668A for PCB analysis for enforcement purposes because that method is not an EPA approved method, but LANL is willing to accept Method 1668A only for reporting purpose. The requirements of using Method 1668A and associated MQLs for PCB analysis and 0.00064 μg/l of total PCB limitation to protect human health in the administratively continued permit were based on the condition of State Certification dated March 30, 2006, and a letter addressing the amendment of State Certification dated February 1, 2007, respectively, when EPA reissued the permit in 2007.

EPA proposed Method 1668C when EPA proposed changes to analysis and sampling test procedures in wastewater regulations (i.e., 40 CFR 136), under the title "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures", in the Federal Register Vol. 75, No. 184, September 23, 2010. Method 1668 determines individual chlorinated biphenyl congeners in environmental samples by isotope dilution and internal standard high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). After consideration of all comments received by EPA, EPA in the final rule making decided to defer the final approval of Method 1668C to a later date.

In accordance with the provision of 40 CFR part 144.22(i)(1)(iv), to assure compliance with permit limitations, the permit shall have requirements to monitor effluents according to test procedures approved under 40 CFR part 136 for the analyses of pollutants having approved methods under that part, and according to a test procedure specified in the permit for pollutants with no approved methods. Because EPA deferred the final approval for Method 1668C, Method 1668C or previous versions (PCB congener method) is currently not an EPA approved 40 CFR part 136 method. Rather, Method 608 or 625 (PCB Aroclor method) is the current EPA approved method which can determine PCB quantities by Aroclors (e.g., PCB-1016, PCB-1221, ... PCB-1260).

Method 1668C or the latest congener method is proposed for monitoring purposes only and not for compliance purposes. But, Method 1668C or the latest congener method will be required whenever a congener method is promulgated and then the minimum levels of quantification (MLs) defined in the congener method procedures may be considered equivalent to MQLs for analytical and reporting purposes. The proposed permit allows the permittee to develop discharge-specific MQLs based on the minimum detection level (MDL) and that the MQL = 3.3 x MDL.

The State of New Mexico, Surface Water Quality Bureau (SWQB), stated in a letter dated December 20, 2012, that "the State will condition the permit certification to require the use of Method 1668, most recent revision thereof, with appropriate method specific MQLs, for purpose of PCB monitoring." The basis for the NMED statement was the WQS found in 20.6.4.900(J)(2), which is 0.00064 μg/l, and NMED rendered that the method detection level of 0.2 μg/l was pointless for purposes of monitoring or compliance.

After considerations of EPA regulations, NMED pre-certification letter, and permittee's request, EPA proposes that EPA published congener Method 1668 Revision and detection levels shall be used for reporting purposes only. Prior to the promulgation of Method 1668, the 0.2 μg/l minimum quantification level (MQL) listed in Appendix to Part II shall be used for compliance purposes. EPA has developed MQLs to monitor compliance for permit limits below analytical values and uses those MQLs to establish defensible permits, so it is common for a MQL greater than the NMWQS. Since EPA has not coded Method 1668 neither developed MQLs for the method, both Method 1668 and its MQLs are not defensible by EPA for compliance purposes. If NMED requires Method 1668 to be used for compliance purposes and/or requires more stringent MQL for compliance purposes, NMED must specify those conditions in the State's Condition of Certification. The public notice for this proposed permit also provides notice that the State of New Mexico will be accepting comments for the State's CWA 401 certification and includes contact information for that process.

The human health-based limitation of 0.00064 µg/l was included in the administratively continued permit because that limitation was also based on the condition of State certification. The NMWQS, section 20.6.4.900.J (f) states "the criteria listed under human health-organism only (HH-OO) are intended to protect human health when aquatic organisms are consumed from waters containing pollutants. These criteria do not protect the aquatic life itself; rather, they protect the health of humans who ingest fish or other aquatic organisms." EPA understands that the HH-OO standards apply to the receiving stream, but has difficulty evaluating the human health impact of the discharge when ingestion of fish or other aquatic organism is unlikely to occur. EPA proposes to retain the monitoring frequency of 1/year for PCBs based on the case-by-case discretionary after considering the following facts: 1) an adverse impact to human health is not imminent; 2) PCBs have been prohibited for decades and LANL is not using PCBs in any process; 3) PCBs were likely deposited in the sewer system and the sewage flow rate is quite constant; 4) LANL has demonstrated its efforts to remove PCBs from discharges; and 5) the cost of Method 1668 is relatively high to the benefit obtained. Because HH-OO standards are established at the receiving water, EPA used the default non-zero harmonic mean flow of 0.001 MGD recommended by NMED to determine the RP for human health-based pollutants. The newly calculated PCB limitation is 0.000642 µg/l. LANL may provide data to support a different "modified harmonic mean flow" as defined in the provision of 20.6.4.11 of the NMWQS during the public comment period, so EPA may conduct a new RP screening and/or establish a new effluent limitation based on new flow information.

EPA determines not to retain the PCB effluent limitations of 0.009 µg/l and 0.014 µg/l based on the wildlife habitat and aquatic life standards because the discharge has no RP to exceed the standards for wildlife habitat and aquatic life based on data collected using the congener method.

5. Whole Effluent Toxicity (WET)

Procedures for implementing WET terms and conditions in NPDES permits are contained in the NMIP, March 15, 2012. Table 11 of Section V of the NMIP outlines the type of WET testing for different types of discharges.

OUTFALL 001

The administratively continued permit established WET biomonitoring with CD = 100%. DMR reports reveal three (3) passing test for both the *Ceriodaphnia dubia* and *Pimephales promelas* species during the last permit term. The EPA Reasonable Potential Analyzer (See Appendix A) indicates that RP exists solely due to the limited number of test results used for RP analysis. Since LANL has not failed a WET test during their last permit term and is conducting tests at the maximum critical dilution, EPA concludes that this effluent does not cause or contribute to an exceedance of the State water quality standards. Therefore, WET limits will not be established in the proposed permit.

The critical dilution, CD, for this discharge is and will remain at 100% because the discharge is to an ephemeral/intermittent water body, but creates a perennial stream, Segment 20.6.4.126. Based on the nature of the discharge, industrial power plant/Sanitary Effluent Reclamation Facility (SERF), and the nature of the receiving water; perennial stream, the Table 11 of the NMIP directs the WET test to be a 7 day chronic test using *Ceriodaphnia dubia* and *Pimephales promelas* at a once per 5 year frequency. The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%.

OUTFALL 03A027

The discharge at Outfall 03A027 is to the Rio Grande Basin segment 20.6.4.126 that encompasses the perennial receiving water, discharge to perennial portion of Sandia canyon from Sigma canyon upstream to LANL NPDES outfall 001.

An acute WET testing requirement with a 80% CD was established in the administratively continued permit because the NMIP establishes an acute-to-chronic ratio (10:1) when the critical dilution falls below 10% (*e.g.* An 8% critical dilution = 80% critical dilution for an acute test). The EPA Reasonable Potential Analyzer for Outfall 03A027 indicates that RP exists for *Daphnia pulex* and *Pimephales promelas*. But since reasonable potential for an excursion of toxicity does not actually exist because lethal (acute test) toxic events were not demonstrated, WET limits will not be established in the proposed permit for Outfall 03A027. Since the critical dilution is risen to 23%, the acute to chronic ratio (which would require an acute CD of 230%) is no longer applicable and chronic testing will be used in lieu of acute testing.

Facilities with discharges that qualify as minor (e.g. treated cooling water blow down that is characteristic of other industry) such as outfall 03A027 will have an one-time effluent characterization WET requirement that consists of chronic WET testing for the *Ceriodaphnida dubia* and *Pimephales promelas* test species. For outfall 03A027, table 11 of the NMIP directs the WET test to be a 7 day chronic test using at a once per five (5) years frequency.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 10%, 13%, 17%, 23%, and 31%. The low-flow effluent concentration (critical low-flow dilution) is defined as 23% effluent.

Since the testing frequencies for the outfall listed in this section is once a year or less, the tests should all occur in winter or springtime when most sensitive juvenile life forms are likely to be present in receiving water and colder ambient temperatures might adversely affect treatment processes. This time will generally be defined as between November 1st and April 30th.

Because the discharge at Outfall 03A027 passed acute WET test during the administratively continued permit term, if the discharge passes the chronic WET test during this permit term, EPA may waive the WET test in the future permit term at this outfall if the nature of discharge is not significantly changed.

OUTFALL 03A199

Facilities with discharges that qualify as minor (e.g. treated cooling water that is characteristic of other industry) such as outfall 03A199 will have an effluent characterization single WET sample event. A chronic WET test with a CD of 35% was established in the administratively continued permit and the discharge has passed the test. Because the discharge has reduced its flow, a new CD is calculated to be 10%. Because the discharge has demonstrated "pass" at a higher CD, EPA determines that further WET test is not required in accordance with the NMIP. A WET testing is not established at this outfall.

OUTFALLS 13S, 03A113, 03A048, 03A160, 03A181, and 05A055

The receiving water, Cañada del Buey for outfall 13S, Sandia canyon for outfall 03A113, Los Alamos canyon for outfall 03A048, Mortandad canyon for outfall 03A160 and 03A181, Water canyon and Cañon de Valle for outfall 05A055 are classified as Rio Grande Basin segment 20.6.4.128 waterbodies.

The NMIP classifies 20.6.4.128 waterbodies as ephemeral or intermittent. Because those waterbodies are designated for limited aquatic life use, EPA applies guidelines for ephemeral stream to determine the type and frequency of WET requirements. Facilities with discharges that qualify as minor (sanitary waste discharge with flow over 0.1 MGD but less than 1.0 MGD) such as outfall 13S will have WET requirements that consist of WET testing for the *Daphnia pulex* test species. For outfall 13S, table 11 of the NMIP directs the WET test to be a 48-hour acute test using *Daphnia pulex* at a once per two years frequency.

Other outfalls that qualify as a minor industrial (excluding some operations such as aquifer remediation and drinking water treatment facilities) such as 03A113, 03A048, 03A160, 03A181, and 05A055 and discharge to ephemeral waterbodies will have WET requirements of an effluent characterization single WET sample event by 48-hour acute test using *Daphnia pulex*. The critical dilution (CD) will be 100% since discharges at those outfalls referenced in this section are to ephemeral streams. Because the WET testing result for Outfalls 03A048, 03A113, 03A160 and 03A181 already demonstrated "pass" of 100% acute WET test, WET requirements are not proposed for these outfalls. There was no discharge at Outfall 05A055 and no WET result could demonstrate a "pass" of 100% acute WET for the discharge, therefore WET requirements are retained for Outfall 05A055.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%. The low-flow effluent concentration (critical low-flow dilution) is defined as 100% effluent. A 3 hour composite rather than a 24 hour composite sample is established for Outfall 05A055 because this discharge will be likely intermittent. The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge.

Since the testing frequencies for all outfalls listed in this section are once a year or less, the tests should all occur in winter or springtime when most sensitive juvenile life forms are likely to be present in receiving water and colder ambient temperatures might adversely affect treatment processes. This time will generally be defined as between November 1st and April 30th.

OUTFALL 051

The administratively continued permit has WET biomonitoring requirement with CD = 100%. DMR reports reveal nine (9) failing tests out of a total of fifteen (15) tests for the *Daphnia pulex* test species during the last permit term. The EPA Reasonable Potential Analyzer indicates that RP exists. EPA concludes that this effluent causes or contributes to an exceedance of the State water quality standards. Therefore WET limits will be established in the proposed permit.

EPA proposes to establish WET requirements for Outfall 051 based on requirements for a major discharge because of the nature of discharge, industrial and radioactive wastewater. Facilities that qualify as majors and discharge to ephemeral waterbodies will have WET requirements that consist of a 100% critical dilution and a 48-hour acute test using *Daphnia pulex* at a once per three (3) months frequency when a WET limit is established. Since the flow from this outfall is intermittent, A 3 hour composite rather than a 24 hour composite sample is established because the discharge is intermittent. The term "3-hour composite sample" means a sample consisting of a minimum of one (1) aliquot of effluent collected at a one-hour interval over a period of up to 3 hour discharge.

The proposed permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests based on a 0.75 dilution series. These additional effluent concentrations shall be 32%, 42%, 56%, 75%, and 100%. The low-flow effluent concentration (critical low-flow dilution) is defined as 100% effluent. Monitoring and reporting requirements begin on the effective date of this permit. March 1, 2016, is proposed as compliance deadline for the Whole Effluent Toxicity limitations.

Because the WET test failures might be caused by low hardness effluent and LANL has adjusted its process to raise effluent hardness and the permit also establishes hardness limit at Outfall 051, EPA will reevaluate the WET RP based on new WET results during the next permit renewal process.

7. Sewage Sludge Management

LANL plans to compost biosolids at the Sanitary Wastewater System Plant and apply composted solids for beneficial uses. Since August 1, 2012, LANL has submitted its Registration package to NMED-Solid Waste Bureau and Notice of Intent to Discharge to NMED-Groundwater Quality Bureau for approval. LANL is also working with NMED-SWQB to resolve SWQB's concerns about storm runoffs.

VI. CWA 303(d) IMPAIRED WATER

Most of the streams within LANL property are impaired waterbodies and industrial point sources have been identified as one of several probable sources of impairment for Mortandad Canyon (where Outfalls 03A022, 03A181 and 051 discharge to) and Canada del Buey (where Outfall 13S discharges to). Industrial point sources were not identified as probable sources for other streams. Because EPA has conducted RP for discharge at each outfall and established effluent limitations if RP was demonstrated; and also because EPA realizes that most of those streams have been contaminated by pollutants carried by historical storm water runoff from Areas of Concern (AOCs) and Solid Waste Management Units (SWMUs) and EPA has issued an individual stormwater permit (NM0030759) to address storm runoffs from those AOCs and SWMUs; EPA determines that it is not necessary to require additional effluent data from these outfalls. NMED has also determined not to take any monitoring action to address the impairment issue for the next 10 years. If TMDLs for these impaired waterbodies are approved in the future, EPA will establish effluent limitations accordingly.

VII. ANTIDEGRADATION

The NMAC, Section 20.6.4.8 "Antidegradation Policy and Implementation Plan" sets forth the requirements to protect designated uses through implementation of the State water quality standards. The limitations and monitoring requirements set forth in the proposed permit are developed from the State water quality standards and are protective of those designated uses. Furthermore, the policy sets forth the intent to protect the existing quality of those waters, whose quality exceeds their designated use. The permit requirements and the limits are protective of the assimilative capacity of the receiving waters, which is protective of the designated uses of that water, NMAC Section 20.6.4.8.A.2.

VIII. ANTIBACKSLIDING

The proposed permit is consistent with the requirements to meet antibacksliding provisions of the Clean Water Act, Section 402(o) and 40 CFR §122.44(l), which state in part that effluent limitations must be as stringent as those in the previous permit. If new effluent data demonstrates no RP for WQ-based limitations, those limitations are removed based on 40 CFR §122.44 (l)(B), new information that was not available at the time the previous permit was issued and was discussed in Part V above. WQ-based effluent limitations may be changed due to new discharge flow rate, new stream flow rate, or new criteria.

IX. HISTORICAL and ARCHEOLOGICAL PRESERVATION CONSIDERATIONS

The reissuance of the permit should have no impact on historical and/or archeological sites since such sites are not found in the mining area.

X. PERMIT REOPENER

Pursuant to the provision of 40 CFR 122.62, this permit may be reopened for modification.

XI. VARIANCE REQUESTS

No variance requests have been received.

XII. CERTIFICATION

The permit is in the process of certification by the State Agency following regulations promulgated at 40 CFR 124.53. A draft permit and draft public notice will be sent to the District Engineer, Corps of Engineers; to the Regional Director of the U.S. Fish and Wildlife Service and to the National Marine Fisheries Service prior to the publication of that notice.

XIII. FINAL DETERMINATION

The public notice describes the procedures for the formulation of final determinations.

XIV. ADMINISTRATIVE RECORD

The following information was used to develop the proposed permit:

A. APPLICATION(s)

EPA Application Form 2C package received February 8, 2012.

B. STATE OF NEW MEXICO REFERENCES

New Mexico State Standards for Interstate and Intrastate Surface Water, 20.6.4 NMAC, as amended through November 20, 2012.

Procedures for Implementing National Pollutant Discharge Elimination System Permits in New Mexico, March 15, 2012.

State of New Mexico 303(d)/305(b) Integrated Report, 2012 - 2014.

13233

In the NMED Hazardous Waste Bureau (HWB) November 2010 permit renewal, General Response to Comments, HWB discussed public comments, including references to the National Academy of Science report **Plans and Practices for Groundwater Protection at the Los Alamos National Laboratory: Final Report.** Quotes from the NAS report including *"Many, if not all of the wells drilled into the regional aquifer under the Hydrogoeologic Workplan appear to be compromised in their ability to produce water samples that are representative of ambient groundwater for the purposes of monitoring."* The Department states in its response it "... *agrees with many of the conclusions in the referenced National Academy of Sciences (NAS) Report, however the report is based on conditions at the time that the NAS conducted the evaluation. Since that time, the Permittees have installed, replaced and rehabilitated numerous well completed in the intermediate perched aquifers and the regional aquifer at the facility. The NAS report does not account for the additional groundwater characterization and actions taken to address the deficient wells".* Continuing, *"The NAS report references wells that were installed as part of LANL's groundwater characterization efforts that were conducted in accordance with their Hydrogeologic Work Plan (1998). As part of these efforts, a total of five regional aquifer characterization wells were installed at or near TA-54. These wells were not installed for contaminant detection or groundwater monitoring. Therefore, these wells have limited relevance to groundwater protection goals set forth by the March 1, 2005 Consent Order".*

I (Steve Huddleson) spoke with Mr. Dave Cobrain of the HWB, regarding the statement that the wells had "limited relevance to groundwater protection goals". Mr. Cobrain stated that the limited relevance referenced was related to the location of the installed wells rather than their viability as an accurate measuring point of groundwater quality. Mr. Cobrain clarified that the wells were placed at locations intended to characterize the extent of impact to the aquifer, but might not necessarily be located at the ideal place for future monitoring of water quality. Additioanlly, Mr. Cobrain stated that contamination discovered in wells installed under the Hydrogeologic Workplan was, in some cases, incidental to their characterization work (not the original intent of the particular well).

Pullen, Steve, NMENV

From:	Chiasson, Jim, NMENV
Sent:	Friday, July 24, 2015 2:03 PM
To:	Huddleson, Steven, NMENV
Subject:	RE: Flow meter question, again...

Steve:

In doing some additional investigation I believe finding a mag meter that can consistently attains a 5%+/- accuracy on a 6" diameter line should be no problem. Some meters, if calibrated correctly and maintained should be able to get 2% +/-.

Now this is considering the design and installation are done correctly such that the meter is not place within several (5+) feet plus and the pump forcing the water thru the meter does not produce any large amounts of turbulence.

So in a nutshell, it can easily be attained and I think in this instance, would be a very reasonable request.

Jim

From: Huddleson, Steven, NMENV
Sent: Thursday, July 23, 2015 12:34 PM
To: Chiasson, Jim, NMENV
Subject: Flow meter question, again...

Jim, my permittees up at LANL are responding to a demand from interested parties that their flow meters meet a +-5% accuracy or better and you have verified to me before that this is attainable, but the lab dudes say that the pipe that it would be installed on is 6" diameter and so they couldn't get better accuracy than +- 10%. Fact or Fiction?

Thanks

Steve Huddleson, P.G., C.P.G.
Manager, Pollution Prevention Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-2936

: 13236

Huddleson, Steven, NMENV

From: Del Signore, Chris <jcds@lanl.gov>
Sent: Monday, July 27, 2015 8:28 AM
To: Huddleson, Steven, NMENV
Cc: Beers, Bob
Subject: RE: pipe diameter?

Pipe diameters are as follows:

Low-level RLW Influent: a combination of 8-inch and 10-inch diameter pipe. The collection system piping was sized for the larger influent flows that existed back in the day, and was sized for sprinkler water from a fire at a generator facility (which has not occurred).

Effluent to the Canyon: 3-inch diameter
Effluent to the MES: 1-inch diameter
Effluent to the SET: 4-inch diameter

From: Huddleson, Steven, NMENV [mailto:Steven.Huddleson@state.nm.us]
Sent: Thursday, July 23, 2015 10:39 AM
To: Del Signore, Chris
Subject: pipe diameter?

Chris, you told me this and I should have written it down. The pipelines to the SET, MES, and outfall are 6-inch diameter? Or was it 8-inch diameter?

Steve Huddleson, P.G., C.P.G.
Manager, Pollution Prevention Section
Ground Water Quality Bureau
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(505) 827-2936

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Environmental Compliance Programs (ENV-CP)
PO Box 1663, K490
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National Nuclear Security Administration
Los Alamos Field Office, A316
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Los Alamos, New Mexico, 87545
(505) 667-5794/Fax (505) 667-5948

Date: JUL 2 8 2015
Symbol: ENV-DO-15-0203
LA-UR: 15-25200
Locates Action No.: NA

Ms. Michelle Hunter, Acting Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Discharge Plan DP-1132 Quarterly Report, Second Quarter 2015, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the second quarter 2015 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the second quarter of 2015, no effluent was discharged to either the National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at TA-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells
Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial well MCO-7 during the second quarter of 2015. No samples were collected from Mortandad Canyon alluvial wells MCO-4B and MCO-6 because there was insufficient water. No sample was collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Samples from well MCO-7 were submitted to GEL Laboratories LLC (GEL) for analysis. Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the second quarter of 2015 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the second quarter of 2015 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
National Security Missions
Los Alamos Field Office
U.S. Department of Energy

AMD:GET:RSB/lm

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Hai Shen, LASO-EP-SG, (E-File)
Gene E. Turner, LASO-NS-LP, (E-File)
Jordan Arnswald, LASO-NS-PI, (E-File)
Kirsten Laskey, LASO-GOV, (E-File)
Craig S. Leasure, PADOPS, (E-File)
Amy E. De Palma, PADOPS, (E-File)
Michael T. Brandt, ADESH, (E-File)
Raeanna Sharp-Geiger, ADESH, (E-File)
Alison M. Dorries, ENV-DO, (E-File)
Randal S. Johnson, DSESH-TA55, (E-File)
Stephen G. Cossey, DSESH-TA55, (E-File)
Michael T. Saladen, ENV-CP, (E-File)
Robert S. Beers, ENV-CP, (E-File)
Leslie K. Sonnenberg, TA-55-RLW, (E-File)
John C. Del Signore, TA-55-RLW, (E-File)
lasomailbox@nnsa.doe.gov, (E-File)
locatesteam@lanl.gov, (E-File)
env-correspondence@lanl.gov, (E-File)

Table 1.0. Mortandad Canyon Alluvial Well Sampling, 2nd Quarter 2015.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B		Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-6		Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-7	F	5/18/2015	10.2	1.1	0.16	0.16	397	0.88
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

<u>Notes:</u>

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

[5]Dry means that there was insufficient water in the well for sampling.

: 13243

Huddleson, Steven, NMENV

From: Maggiore, Peter <Peter.Maggiore@nnsa.doe.gov>
Sent: Monday, November 09, 2015 3:06 PM
To: Huddleson, Steven, NMENV
Subject: RE: DP-1132 issues

Hi Steve – upon my return to the office I started checking on the sign placement issue. I have learned that the next step is for the lawyers to convene to review and discuss remaining unresolved items. I respectfully suggest that we let this meeting run its course in hopes of getting things resolved.

Best –

Pete

From: Huddleson, Steven, NMENV [mailto:Steven.Huddleson@state.nm.us]
Sent: Monday, November 02, 2015 2:10 PM
To: Maggiore, Peter <Peter.Maggiore@nnsa.doe.gov>
Subject: DP-1132 issues

Pete, hope you are doing well. I wonder if I could impose on you to facilitate follow-through on a couple of issues brought up in previous technical meetings regarding DP-1132. The first issue you brought on yourself as you kind of volunteered in the technical meeting in April to intercede on issues related to the warning sign frequency, language on the signs and posting frequency. In our last meeting, Bob Beers was going to check on the posting frequency (how close together the signs on the perimeter fencing around the lab and what the RCRA language was regarding posting) but no follow up since then. Could you try to get someone to contact Kathy Sanchez to resolve or at least discuss this issue? Secondly, Marian Naranjo was concerned about the level of involvement by Pueblo officials on emergency situations involving the EOC. Maybe somebody could reach out to her to discuss what level of involvement the Pueblo's have in an ER situation?

Joni Arends is concerned that these two issues remain outstanding and unaddressed as they prepare their next set of comments to the September 18 Draft Discharge Permit. Happy November, what a glorious day it is, and I wish I was someplace out enjoying it.

Steve Huddleson, P.G., C.P.G.
Manager, Pollution Prevention Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-2936

: 13244

Communities For Clean Water

Memo to: Steve Huddleson, Ground Water Quality Bureau
New Mexico Environment Department (NMED)
From: Communities for Clean Water (CCW)
Date: November 23, 2015
RE: CCW Comments to September 18, 2015 draft DP-1132 permit

Steve,

The September 18, 2015 NMED draft discharge permit, DP-1132, released for review on September 28, 2015, raises the following questions and comments for CCW:

1. Table of Contents: Change title of Condition 31 to "Soil Moisture Monitoring System Exceedance" to reflect change in the draft permit.
2. II.G, II.H: Given that the RLWTF is intended to be a "zero discharge" facility, does the definition of "discharge" or of "effluent" refer to any substance or event normally occurring at the RLWTF? It seems not.
3. II.Q: It should be noted in the permit that the definition of Incident Command System refers to a specific system developed by the Department of Homeland Security.
4. II.R: The definition of "leak detection system" seems to assume that a secondary containment system is in use. The definition should also apply to single containment leak-detection systems.
5. II.U: The definition of "open unit or system" has a misstatement. Should it state "in which"?
6. II.Y: The definition of "secondary containment" would not be met by some planned piping systems, which would not have a "foundation or base" as described.

7. II.Z: As described, a "settled solids measurement device" is not designed to measure the depth (thickness) of settled solids. However, this is the use to which it is put later in the permit. See sec. VI(A)(10). The definition should be fixed to include this purpose.
8. The definition of "tank" (item CC) follows the Resource Conservation and Recovery Act ("RCRA") definition (40 CFR § 260.10). Thus, presumably, it adopts the "parking lot" test for defining a tank: the item must be self-supporting if filled and placed on a flat surface (like a parking lot). We have seen no engineering report or engineer's statement confirming that the SET "tanks" meet the RCRA definition.
9. The Draft contains "Findings" (sec. IV, A-D), which state that the facility is discharging effluent or leachate, which may move into ground water. There is no basis for such statements, which are in fact untrue.
10. The Authorization to Discharge (sec. V.C) is unnecessary and should not be given to the Permittees, since no discharges are planned. The statements in section V.C, authorizing the Permittees to "discharge" into the Mechanical Evaporator System ("MES") or the Solar Evaporative Tank ("SET") System are not logical, because "discharge" is defined as a release that may move directly or indirectly into ground water or interfere with health, etc. (sec. II.G.) A discharge into the MES or the SET is not calculated to move into ground water or interfere with health. Further, the authorization to discharge through Outfall 051 is not proper, since the Permittees state that the RLWTF will be a "zero-discharge" facility; Permittees do not propose to make any discharges through Outfall 051 and should not be given authority to do so.
11. The draft refers to the Influent Collection System (sec. V.D). Since NMED identifies that system as part of the regulated facility, the Permit should incorporate a

schematic and a scale drawing depicting the collection system, which, as part of the regulated facility, is subject to inspection and operational oversight by NMED.

12. Likewise, the Permit should incorporate a schematic and a scale drawing of the other elements of the permitted facility, i.e., the Low-level Radioactive Waste Water Treatment System, the Transuranic ("TRU") Waste Water Treatment System, the Secondary Treatment System, the MES, and the SET. Such systems are all subject to inspection and oversight by the regulator, NMED. Plans and specifications are required to be on file before the commencement of construction. See 20.6.2.1202, 20.6.2.3107 NMAC.

13. The draft Permit calls for approval by NMED of system or unit modifications, based on public comment. (Sec. VI.A.3). However, the public processes specified in 20.6.2.3108 NMAC apply only to a "discharge permit modification" as defined in 20.6.2.7.P. NMAC. The definition in 20.6.2.7.P NMAC is limited to modifications that significantly change the quantity or quality of the discharge, or as required by the Secretary. In the instance of the RLWTF there will be no changes in the quantity or quality of the discharge, since there will be no discharge. Therefore, we submit, the Permit should state instead that the Secretary has determined that any change in waste transportation, storage or treatment equipment or methods constitutes a "discharge permit modification" and requires a public process under the rules. The Permit should also state that the processes laid out in Sec. VI.A.3 are in addition to, and do not exclude, the processes called for in 20.6.2.3108-3114 NMAC.

14. CCW understood from the September 17, 2015 technical meeting that Applicants would contact CCW representatives about signs and arrange for a field trip to the area to determine the best placement for the signs. Also, see Comment [4] in September 18, 2015 draft permit for Condition 6, Signs. We are hopeful that the

signage issues can be resolved in discussions with the Applicants - prior to our next meeting.

15. The draft (Sec. VI (A)(7)) calls for verification of secondary containment by equipment that manages "untreated" liquid or semi-liquid waste. But "treatment" is loosely defined as any method that modifies waste characteristics, etc. (Sec. II.FF). We cannot be sure how LANL interprets "treatment," in defining equipment that must have secondary containment. CCW has proposed double containment for the pipe that supplies the SET. This is not required in the draft, and the failure to require it is not explained.
16. CCW continues to believe that the provision of a plan 60 days before removal of settled solids is too long. (Sec. VI(A)(10)). The method of removal of solids will have been established in the first round of removal. It is not necessary to provide 60 days' notice for each round, unless the methods change.
17. Condition VI(A)(12), Containment, is the first of several sections that concern responses to identified emergencies and violations. See VI(A)12, 13, 14, 15, 18, 31, 37, 38, 39. It would be best to have a single regulatory structure for such situations. The Permit might require the Permittees, when a violation or an unintended release is identified, to follow these steps:

    a. Report informally, but not just orally, to NMED (i.e., email) within 24 hours.

    b. Take action as promptly as reasonably possible (e.g., that day) to prevent potential releases from the source term.

    c. When an exceedance of an effluent is reported in analytical results, Applicants are required to "collect and submit for analysis a subsequent sample for the particular analyte that was in exceedance." Condition VI(A)(18).

d. Submit a report on the problem and a corrective action plan within 14 days, or ask for more time within 14 days. Work, other than emergency work, should not proceed without NMED's approval.

e. The plan should include a schedule for stages of work, ending in a report of completion, which NMED must approve.

Such a framework could be contained in Condition VI(A)(13), Maintenance and Repair, and incorporated by cross-reference in Condition VI(A)(14), Damage to Structural Integrity, Condition VI(A)(18), Effluent Exceedance, Condition VI(A)(31), Release Detection System Exceedance, Condition VI(A)(37), Ground Water Exceedance, Condition VI(A)(38), Spill or Unauthorized Release, and Condition VI(A)(39), and Failures in Discharge Plan/Discharge Permit.

18. Condition VI(A)(14). Please change reference to Condition VI(E)(53) to "Extension of Time."

19. Condition VI(A)(20), Emergency Response Procedures, refers directly to the National Incident Management System (NIMS). This ought to require LANL to pre-plan for pueblo involvement and to alert and include any pueblo potentially affected by an incident. But will LANL do that? Please confirm this.

20. Further, the emergency response procedures should be review annually, not on a triennial basis. CCW previously submitted support for our position on this important issue.

21. Condition VI(A)(21) on installation of flow meters still requires that the meters be installed only within 180 days. But there is no technical justification for not having the flow meters in place before discharges to and from the RLWTF begin. See the example of installing monitoring equipment prior to use of the system at Condition 30 (Soil Moisture Monitoring for the SET).

22. Condition VI(A)(22), Calibration of Flow Meters, calls for accuracy within plus or minus 5% for the effluent lines to the SET, MES and Outfall 051. We have asked for much closer tolerances—less than 1%. The Applicants have not provided a technical justification for accuracy within plus or minus 5%.

23. Further, the draft permit allows for the flow meter on the 10-inch influent line to the RLWTF to be calibrated to within plus or minus 10%. Again, the Applicants have not provided technical justification for accuracy within plus or minus 10%.

24. Condition VI(A)(30). CCW objects to a 2% precision for the soil moisture monitoring system for the SET. Applicants have not provided technical justification for precision within plus or minus 2%.

25. Condition VI(A)(32) Ground Water Flow. For clarity, we suggest removing "in conjunction with the Quarterly Report" in the first sentence.

26. Condition VI(A)(36). CCW opposes using defective regional wells R-46, R-60, R-1 and R-14 for groundwater monitoring for reasons described by Gilkeson and the National Academy of Sciences in various submittals to NMED and the Ground Water Quality Bureau.

27. Condition VI(A)(42), Closure Plan. CCW supports the December 31, 2015 deadline for the Applicants to submit a proposed closure plan. CCW requests that NMED change the existing language in the permit that requires submittal of the closure plan after permit issuance.

28. The permit should clearly state when the annual updates of the Closure Plan are due to NMED. Are they due February 1 in the Annual Update (VI(A)(1)) or on another schedule?

29. Condition VI(A)(46), Integration with the Consent Order, has been revised. The reference to SWMUs and AOCs "that are contained within the Compliance Order on

Consent" is ambiguous, since that Order incorporates various lists of SWMUs and AOCs, having various different statuses. The statement that cleanup of "any future SWMUs and AOCs associated with the Facility shall be conducted solely under the Consent Order and not under this Permit" contradicts the Consent Order, which expressly excludes from its scope "(1) new releases of hazardous waste or hazardous constituents from operating units at the Facility, . . . " (par. III.W.1). It is not appropriate to include such erroneous language in DP-1132; in any case it cannot change the terms of the LANL RCRA Permit or the Consent Order.

30. Condition VI(A)(49), Electronic Posting, lists mandatory and voluntary posting requirements. There is no mention of the Permittees posting NMED responses or those of citizen groups. The Permit should state that any responses to or comments on posted reports will themselves be posted.

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Environmental Compliance Programs (ENV-CP)
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(505) 667-0666

National Nuclear Security Administration
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(505) 667-6764/Fax (505) 667-5948

Date: JAN 2 0 2016
Symbol: ENV-DO-16-003
LA-UR: 15-29657
Locates Action No.: *NA*

GROUND WATER
JAN 21 2016
BUREAU

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Discharge Plan DP-1132 Quarterly Report, Fourth Quarter 2015, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the fourth quarter 2015 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the fourth quarter of 2015, no effluent was discharged to either National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at TA-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells
Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial wells MCO-4B, MCO-6, and MCO-7 during the fourth quarter of 2015. No sample was collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Samples from wells MCO-4B, MCO-6, and MCO-7 were submitted to GEL Laboratories LLC for analysis. Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the fourth quarter of 2015 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the fourth quarter of 2015 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security LLC

Sincerely,

for Jody Pugh
Assistant Manager
National Security Missions
Los Alamos Field Office
U.S. Department of Energy

AMD:JA:MTS:RSB/lm

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Hai Shen, EM-SG, (E-File)
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Randal S. Johnson, DSESH-TA55, (E-File)
Stephen G. Cossey, DSESH-TA55, (E-File)
Michael T. Saladen, ENV-CP, (E-File)
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Table 1.0. Mortandad Canyon Alluvial Well Sampling, 4th Quarter 2015.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B	F	11/18/2015	4.2	0.51	0.20	0.26	340	0.84
MCO-6	F	11/18/2015	7.7	0.48	0.10	0.10	361	0.92
MCO-7	F	11/17/2015	10	1.7	0.0413J	0.06	333	1.0
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

Notes:

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

J flag indicates an estimated value.

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Huddleson, Steven, NMENV

From:	Kieling, John, NMENV
Sent:	Thursday, January 21, 2016 3:31 PM
To:	Huddleson, Steven, NMENV
Subject:	RE: Closure Plan, RLWTF

Steve,
HWB has reviewed the RLWTF closure plan and do not have any comments.

Thanks,
John

From: Huddleson, Steven, NMENV
Sent: Wednesday, December 30, 2015 1:28 PM
To: Kieling, John, NMENV
Cc: Roberts, Kathryn, NMENV; Hunter, Michelle, NMENV; Kliphuis, Trais, NMENV
Subject: Closure Plan, RLWTF

Mr. Kieling, LANS/DOE has provided the closure plan for TA-50, the RLWTF. As you know, LANS/DOE are currently constructing the replacement facility and the closure plan for the existing facility will become an attachment to the discharge permit DP-1132. Would someone on your team be available to give this a review for adequacy? This document will be under intense scrutiny from CCW, CCNS, Amigos Bravos, concerned citizens of all sorts and, of course, their attorneys. I would like to be confident that the plan is solid. Timing is not hypercritical, but I would like to have the next draft discharge permit out for comment sometime in January. Thanks sir.

Steve Huddleson, P.G., C.P.G.
Manager, Pollution Prevention Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-2936

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

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RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

January 29, 2016

Alison M. Dorries, Division Leader
Environmental Protection Division
Los Alamos National Laboratory
P.O. Box 1663 MS K490
Los Alamos, New Mexico 87545-0001

RE: Comments on 60% Design Plans and Specifications Radioactive Liquid Waste Treatment Facility - Upgrade Project Transuranic Liquid Waste Project, DP-1132

Dear Ms. Dorries:

The New Mexico Environment Department, Ground Water Quality Bureau (GWQB) has received from the Department of Energy and Los Alamos National Security LLC (DOE/LANS) design documents for the Radioactive Liquid Waste Treatment Facility Upgrade Project (RLWTF UP) including:

- 60% design plans and specifications for the RLWTF UP at Technical Area (TA)-50, including supplemental information to discharge permit application DP-1132.

The DOE/LANS has requested comments from GWQB on the referenced plans and specifications. GWQB has reviewed the 60% plans and specifications for compliance with basic elements necessary for protection of groundwater quality. GWQB makes no comment regarding the design adequacy, compliance with applicable State, Federal, and local statute, code and requirements.

The review confirms that the design, construction specifications, proposed systems and calculations are generally appropriate, and include adequate safeguards to protect groundwater quality including secondary containment for in-service drums of ferric chloride, and structural integrity of sanitary sewer lines and their connections to manholes. While not a concern for ground water, the GWQB notes that the water quality acute criterion for chlorine in surface water is 19 ug/L, which needs to be taken into account if chlorinated water from disinfecting water

13262

supply pipe is discharged to a surface water. Also, in Section 22 0816, 3.4 D, the word "chloride" should be "chlorine".

As a sealed engineering document, GWQB relies on the design engineer for the efficacy of the design to meet permit requirements. GWQB similarly relies on DOE/LANS to provide adequate construction oversight to ensure conformance with the design specifications. Construction of the facility prior to issuance of the final approved Discharge Permit will proceed at DOE/LANS own risk, should DOE/LANS decide to proceed with construction before GWQB issues the final permit.

The GWQB appreciates the opportunity to provide these comments on the proposed RLWTF Upgrade Project. Please contact me or Steven Huddleson at (505) 827-2936 if you have any questions.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

cc: Gene E. Turner, Los Alamos National Laboratory, P.O. Box 1663 MS K490
Los Alamos, New Mexico 87545-0001
John Kieling, Hazardous Waste Bureau (electronic copy)
Jim Chiasson, Construction Programs Bureau (electronic copy)
Steven Huddleson, Ground Water Quality Bureau (electronic copy)
Gerard Knutson, Ground Water Quality Bureau (electronic copy)
Bruce Yurdin, Surface Water Quality Bureau (electronic copy)
Jennifer Hower, Office of General Counsel (electronic copy)

: 13264

Huddleson, Steven, NMENV

From: Beers, Bob <bbeers@lanl.gov>
Sent: Monday, February 08, 2016 8:53 AM
To: Huddleson, Steven, NMENV
Cc: Saladen, Michael Thomas; Knutson, Gerald, NMENV; Huey, Greg, NMENV; Jordan.arnswald@nnsa.doe.gov; Del Signore, Chris; McGovern, Hugh Albert; Pullen, Steve, NMENV
Subject: RE: Request for Information: Former Septic System at TA-50

Steve,

Yes, my understanding is consistent with yours: the entire septic system was removed with the exception of the perforated pipe. The site is a SWMU and will be investigated once the facility is closed.

Bob

From: Huddleson, Steven, NMENV [mailto:Steven.Huddleson@state.nm.us]
Sent: Thursday, February 04, 2016 4:40 PM
To: Beers, Bob
Cc: Knutson, Gerald, NMENV; Huey, Greg, NMENV; Pullen, Steve, NMENV; Del Signore, Chris; McGovern, Hugh Albert; Saladen, Michael Thomas; Jordan.arnswald@nnsa.doe.gov
Subject: RE: Request for Information: Former Septic System at TA-50

First, I am impressed you found this so quickly, and second it is not much help. So to alleviate ponding in the leach field they drilled a 50 foot deep dry well that still exists. They installed 8 bore holes and collected geotechnical and characterization samples but no information is presented on the results. Is that what you get out of it?

From: Beers, Bob [mailto:bbeers@lanl.gov]
Sent: Thursday, February 04, 2016 4:15 PM
To: Huddleson, Steven, NMENV
Cc: Knutson, Gerald, NMENV; Huey, Greg, NMENV; Pullen, Steve, NMENV; Del Signore, Chris; McGovern, Hugh Albert; Saladen, Michael Thomas; Jordan.arnswald@nnsa.doe.gov
Subject: Request for Information: Former Septic System at TA-50

Hi Steve,

At our meeting on draft Discharge Permit DP-1132 on January 28, 2016, you requested information on a former septic system at Technical Area (TA)-50.

Attached is a copy of a Solid Waste Management Unit (SWMU) report for the referenced system.

The report indicates that the system operated from 1964 until 1983 when the entire system was removed (with the exception of a perforated pipe installed in the leach field).

Please let me know if you have questions.

Sincerely,

Bob Beers
Los Alamos National Security, LLC

SWMU 50-011(a). septic system

Status: DRAFT

SWMU 50-011(a)

Permit Status: HSWA - Table K-1
Corrective Action Status: In Progress
Technical Area: TA-50 Structure Number: 50-9, 50-10, 50-11
Watershed (Reporting): Mortandad Aggregate Area (Reporting): Upper Mortandad Canyon
Land Transfer?: No Private Property?: No
Sampled by ER Project?: Yes EX-ID/PR-ID Info?: Yes
Dates of Operation: 1964-1983 Former Operable Unit: OU 1147
IP Site? NoPotholing Allowed? No

Unit Description

SWMU 50-011(a) is the location of a former septic system that was installed at TA-50 in 1964 at the south end of the RLWTF (Building 50-1). The septic system consisted of an influent line from Building 50-1 that discharged to a manhole (structure 50-9) and then to a septic tank (structure 50-10). The effluent line from the tank tied to a distribution box (structure 50-11), which discharged to four parallel perforated pipes traversing a leach field.

In 1978, a 4-ft-diameter x 50-ft-deep shaft was drilled at the east end of the leach field to address problems with standing water on the ground surface. A 4-in. perforated pipe was installed in the shaft, and the annulus was backfilled to within 4 ft of the ground surface. The outlets of the four parallel pipes were then tied into the newly installed perforated pipe.

With the exception of the perforated pipe installed in the leach field in 1978, the entire septic system was removed in 1983. Currently, a storage building (Building 50-83) and an asphalt pad cover the area formerly occupied by the septic system. The 50-ft-deep shaft and perforated pipe that remain in place are also located beneath storage Building 50-83.

Previous investigations of the area surrounding SWMU 50-011(a) were conducted in 1986, during decommissioning of the RLW line. Excavated soils were characterized for radioactive constituents and remediated to meet ALARA levels.

Project Activities

The ER Project conducted an RFI at SWMU 50-011(a) in 1994 to determine the presence of and define the nature and extent of any contamination. The ER project conducted supplemental RFI sampling in 2004 and 2005.

In December 2001, geotechnical and waste characterization samples were collected from eight boreholes, including one adjacent to the seepage pit, to determine the feasibility of constructing a new pump house and influent storage tank vault at TA-50.

Site Contamination

Site Contamination is not available.

Site Status

Site Status is not available.

SWMU 50-011(a). septic system

Documents No Photographs No Maps
WBS

NOTE: Information presented on this page was derived from previously published documents and subject matter expert knowledge. Any discussion of BVs, FVs, and SSL/SALs is taken from referenced documents and reflects the values in use at the time the documents were written. If RFI activities were conducted at this site, they are described in detail in the documents listed in the Documents hyperlink above.

<< Back to PRS Home

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(505) 606-0397/Fax (505) 284-7522

Date: APR 2 8 2016
Symbol: EPC-DO-16-095
LA-UR: 16-22163
Locates Action No.: N/A

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Discharge Plan DP-1132 Quarterly Report, First Quarter 2016, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the first quarter 2016 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the first quarter of 2016, no effluent was discharged to either National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at TA-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells

Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial wells MCO-6 and MCO-7 during the first quarter of 2016. No sample was collected from alluvial well MCO-4B because there was insufficient water in the well for sampling. No sample was collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Samples from wells MCO-6 and MCO-7 were submitted to GEL Laboratories LLC for analysis. Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the first quarter of 2016 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the first quarter of 2016 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

John P. McCann
Acting Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security LLC

Sincerely,

Jody M. Pugh
Assistant Manager
National Security Missions
NNSA/Los Alamos Field Office

JPM:JMP:MTS:RSB/lm

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
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Table 1.0. Mortandad Canyon Alluvial Well Sampling, 1st Quarter 2016.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B		Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-6	F	2/12/2016	4.3	0.61	0.20	0.07	287	0.93
MCO-7	F	2/12/2016	8.3	0.90	0.10	0.10	309	0.93
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

Notes:

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

[5]Dry means there was not sufficient water for sampling.

J flag indicates an estimated value.

13271

13272

Environmental Protection & Compliance Division
Environmental Compliance Programs (EPC-CP)
PO Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666

National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87544
(505) 606-0397/Fax (505) 284-7522

Date: JUN 0 3 2016
Symbol: EPC-DO-16-133
LA-UR: 16-23627
Locates Action No.: NA

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Supplemental Information for Discharge Permit Application DP-1132, Radioactive Liquid Waste Treatment Facility, Los Alamos National Laboratory

In February 2012 the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) submitted a discharge permit application to the New Mexico Environment Department (NMED) for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Subsequently, in August 2012 DOE/LANS submitted supplemental information to the above-referenced discharge permit application (ENV-RCRA-12-0173). A copy is provided as Enclosure 1. It is necessary for DOE/LANS to revise discharge permit application DP-1132 again, with the removal of the Polishing Ion Exchange treatment unit, to reflect current operating conditions at the RLWTF.

The Polishing Ion Exchange treatment unit (Main Treatment Unit M9) was listed Section B-7 and Appendix B of the February 2012 permit application as an ion exchange (IX) treatment unit for the removal of zinc (Zn) and copper (Cu). With the issuance of the new National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 (effective 10-1-2014), this treatment step is no longer required to meet the applicable permit limits for Outfall 051. About two-thirds of the unit's equipment has been decommissioned and the remaining equipment remains locked out-of-service. A revised discharge permit application, process schematic, and scaled floor plan are provided in Enclosures 2, 3, 4, and 5.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this information.

Sincerely,

John P. McCann
Acting Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security, LLC

Sincerely,

Jody M. Pugh
Assistant Manager
National Security Missions
NNSA/Los Alamos Field Office

JPM:JMP:MTS:RSB/lm

Enclosures: (1) Supplemental Information for Discharge Permit Application DP-1132, Radioactive Liquid Waste Treatment Facility (RLWTF) and Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, ENV-RCRA-12-0173, August 10, 2012
(2) Revised Section B-7—Redline and Final
(3) Revised RLWTF Processes and Units—Appendix B – Redline and Final
(4) Revised Process Schematic—Appendix B
(5) Revised Scaled Floor Plan—Appendix B

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)
Stephen M. Yanicak, NMED/DOE/OB, (E-File)
Jody Pugh, NA-LA, (E-File)
Jordan Arnswald, NA-LA, (E-File)
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Date: AUG 1 0 2012
Refer To: ENV-RCRA-12-0173
LAUR: 12-21591

Mr. Jerry Schoeppner, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Mr. Schoeppner:

SUBJECT: SUPPLEMENTAL INFORMATION FOR DISCHARGE PERMIT APPLICATION DP-1132, RADIOACTIVE LIQUID WASTE TREATMENT FACILITY (RLWTF) AND ZERO LIQUID DISCHARGE (ZLD) SOLAR EVAPORATION TANKS

On November 18, 2011, the New Mexico Environment Department (NMED) notified the U. S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) that a comprehensive, up-to-date application was required to issue Discharge Permit (DP)-1132 for the Technical Area 50 (TA-50) Radioactive Liquid Waste Treatment Facility and the TA-52 Zero Liquid Discharge Solar Evaporation Tanks. A Discharge Permit application (ENV-DO-12-0005) and supplement (ENV-DO-12-0019) were submitted to NMED by DOE/LANS on February 16, 2012, and April 2, 2012, respectively. After the above-referenced application and supplement were submitted, DOE/LANS confirmed that they could replace seven vessels at the TA-50 RLWTF with two new storage tank systems with leak detection capability located at the TA-50 Waste Mitigation and Risk Management (WMRM) Facility. This significant and improved change requires DOE/LANS to submit the enclosed supplement and modification to its existing permit application.

ENCLOSURE 1

Supplemental Information for Discharge Permit Application DP-1132, Radioactive Liquid Waste Treatment Facility (RLWTF) and Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, ENV-RCRA-12-0173, August 10, 2012

EPC-DO-16-133

LA-UR-16-23627

Date: JUN 0 3 2016

The table below lists the seven vessels DOE/LANS propose to remove from service and the corresponding replacement vessels. These modifications will also remove from service a single-wall pipe that connects the 75,000-gal. influent tank to the clarifiers. Engineering design is currently underway to affect the above-referenced modifications to the TA-50 RLWTF. In the interim, wastewater storage and treatment processes at the TA-50 RLWTF will be conducted in accordance with processes and units described in the DP-1132 permit application and supplement submitted on February 16, 2012, and April 2, 2012, respectively.

Existing Vessel				Replacement Vessel		
Location	**Vessel**	**Vessel Use**	**Volume (gal.)**	**Location**	**Vessel**	**Volume (gal.)**
TA-50-02	75K tank	Influent storage	75,000	TA-50-250	WMRM Tanks (2)	50,000[1]
TA-50-02	WM2-North	Effluent storage	25,000	na	na	na
TA-50-02	WM2-South	Effluent storage	25,000	na	na	na
TA-50-01	Clarifier #1	Chemical precipitation	20,000	TA-50-01	TK71	10,000
TA-50-01	Clarifier #2	Chemical precipitation	20,000	TA-50-01	TK72	10,000
TA-50-01	Gravity Filter	Solids separation	7,000	TA-50-01	filter/sludge/clean[2]	40/500/200[1]
TA-50-90	100K Tank	Influent storage	100,000	na	na	na

[1]Capacity is for each tank.
[2]Microfilter

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this information.

Sincerely,

Alison M. Dorries
Division Leader
Environmental Protection Division
Los Alamos National Security, LLC

Sincerely,

Peter Maggiore for

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
U.S. Department of Energy

AMD:GET:RSB/lm

Enclosures:

1. Supplemental Information, DP-1132 Application, Revised Sections A-8, A-9, and B-12.
2. Supplemental Information, DP-1132 Application, Revised Section B-7.
3. Supplemental Information, DP-1132 Application, Revised RLWTF Processes and Units—Appendix B.
4. Supplemental Information, DP-1132 Application, Revised Process Schematic—Appendix B.
5. Supplemental Information, DP-1132 Application, Revised Scaled Floor Plan—Appendix B.

Cy: Joni Arends, Concerned Citizens for Nuclear Safety, Santa Fe, NM, w/enc.
Jonathan M. Block, New Mexico Environmental Law Center, Santa Fe, NM, w/enc.
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Randal S. Johnson, ENV-ES, w/enc., (E-File)
IRM-RMMSO, w/enc., (E-File)
ENV-RCRA Correspondence File, w/enc., K490

ENCLOSURE 1

Supplemental Information, DP-1132 Application

Revised Sections A-8, A-9, and B-12 – Redline

Revised Sections A-8, A-9, and B-12 – Final

ENV-RCRA-12-0173

LAUR-12-21591

Date: AUG 1 0 2012

A-8. Processing, Treatment, Storage and Disposal System. Briefly describe how wastewater, sludge, etc. is processed, treated, stored, and/or disposed of at your facility. See Supplemental Instructions for examples of system components.

The Radioactive Liquid Waste Treatment Facility (RLWTF) consists of (a) an underground collection system that conveys water to Technical Area (TA) 50 from generators at LANL, (b) structures at TA-50, and (c) Zero Liquid Discharge Solar Evaporation Tanks at TA- 52. At Technical Area 50, Building 50-01 is the primary structure; it houses treatment equipment, process tanks, analytical laboratories, and offices. Adjacent TA-50 structures primarily provide for additional water storage: ~~50-02 (influent),~~ 50-66 (influent), ~~50- 90 (influent),~~ 50-248 (secondary waters), and 50-250 (influent and emergency).

The RLWTF receives and treats radioactive liquid waste (RLW) from generators at Los Alamos National Laboratory. RLW includes small volumes, less than one percent of total influent, that are also characteristically hazardous for corrosivity, which are treated using elementary neutralization. The RLWTF has (1) a main treatment process for low-level RLW, (2) a process for treating transuranic RLW, and (3) a secondary treatment process for waste streams from both the low-level and transuranic processes.

1) The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. ~~Treatment~~ Process steps include treatment with chemicals in a reaction tank, ~~clarification~~, filtration, ion exchange, and reverse osmosis. Discharge to the environment is via NPDES Outfall #051, solar evaporation at the TA-52 Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, or ~~mechanical~~ evaporation using natural gas at TA-50-257. Two secondary streams are generated by primary treatment, sludge and reverse osmosis concentrate; they are sent to the secondary treatment process.

2) Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant as a solid transuranic waste.

3) The secondary treatment process treats wastes from the primary and transuranic treatment lines. It consists of a rotary vacuum filter to treat sludge from the main treatment process, secondary reverse osmosis to treat reverse osmosis concentrate from the main process and/or effluent from the transuranic process, and a bottoms disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

A-9. **Discharge Locations.** List the locations of your facility and of all components of your processing, treatment, storage and/or disposal system. Examples of components include septic tanks, lagoons, leachfields, irrigation sites, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Latitude and longitude are optional unless township, range and section are not available.

Components	Township	Range	Section(s)	Latitude	Longitude
~~RLWTF Mechanical~~ Natural Gas Evaporator (50-257)	19N	6E	22	~~35° 51' 58.3"~~ 35° 51' 43.4"	~~-106° 17' 48.5"~~ -106° 17' 51.8"
NPDES Outfall #051 (NM0028355)	19N	6E	22	35° 51' 54"	-106° 17' 52"
TA-52 Zero Liquid Discharge Solar Evaporation Tanks (currently under construction)	19N	6E	22	35° 51' 36"	-106° 17' 12"

B-12. **Discharge Volumes.** Describe how and where the monthly discharge volume at your facility will be. For all measuring devices, provide type, location, and units of measure including multipliers (e.g., gallons, gallons x 100, acre-ft, etc.) See Supplemental Instructions. Attach additional pages, if necessary.

Discharges of treated water to the environment are measured by the following methods:

- Low-level influent: ~~Low-level RLW influent volumes are determined by daily water balance. The levels of process vessels and tanks are continuously monitored with information transmitted electronically to the RLWTF control room. Level changes are converted to volume changes, which are summed daily. Influent is determined as the sum of tank volume changes plus volumes of water discharged to the environment and water removed as sludge. Tank level and other volume information is reviewed daily to assure activities and tank level changes agree with actual plant operations.~~

  Low-level RLW influent volumes will be determined by monitoring and recording the change in level of Tank 5 and Tank 6 in the Waste Management and Risk Mitigation (WMRM) Facility. While radioactive liquid waste (RLW) is being fed to the treatment process from one of these two influent tanks (e.g., Tank 5), fresh influent will be received in the other influent tank (e.g., Tank 6). In this illustration, the change in level of Tank 6 from one day to the next will reflect the volume of the influent received.
- Transuranic influent: Transuranic influent is received in batches from TA-55, with influent collected in either the acid tank or caustic tank in Building 50-66. Level probes for these tanks are linked electronically to the RLWTF control room. Operators monitor and record tank level changes during each influent batch transfer. Influent volumes are calculated from the difference between beginning and ending tank levels.

- Discharge to the environment by ~~mechanical~~ evaporation using natural gas at 50-257: Treated water is fed to the evaporator from the effluent Frac tanks in Room 34B; water is typically fed continuously during the normal work week, including overnight. Volumes are read in gallons from a water meter on the evaporator feed line.

- Discharge to the environment by solar evaporation: Treated water is discharged to the TA-52 Zero Liquid Discharge Solar Evaporation Tanks from either of the effluent Frac tanks in Room 34B, or from TK38 in Room 38. Discharges occur in batches. The volume, in gallons, of each discharge is calculated from the change in tank level. If discharges are from the effluent Frac tanks, which are horizontal tanks, before- and after-discharge tank volumes are determined from a table that correlates tank level and volume of water in the tank. If discharges are from TK38, pre and post discharge tank volumes are read directly from markings on this translucent vertical tank.

- Discharge to the environment via NPDES Outfall #051: Treated water is discharged from either of the effluent Frac tanks in Room 34B, or from TK38 in Room 38. Discharges occur in batches. The volume, in gallons, of each discharge is calculated from the change in tank level. If discharges are from the effluent Frac tanks, which are horizontal tanks, before- and after-discharge tank volumes are determined from a table that correlates tank level and volume of water in the tank. If discharges are from TK38, pre and post discharge tank volumes are read directly from markings on this translucent vertical tank.

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The Radioactive Liquid Waste Treatment Facility (RLWTF) consists of (a) an underground collection system that conveys water to Technical Area (TA) 50 from generators at LANL, (b) structures at TA-50, and (c) Zero Liquid Discharge Solar Evaporation Tanks at TA- 52. At Technical Area 50, Building 50-01 is the primary structure; it houses treatment equipment, process tanks, analytical laboratories, and offices. Adjacent TA-50 structures primarily provide for additional water storage: 50-66 (influent), 50-248 (secondary waters), and 50-250 (influent and emergency).

The RLWTF receives and treats radioactive liquid waste (RLW) from generators at Los Alamos National Laboratory. RLW includes small volumes, less than one percent of total influent, that are also characteristically hazardous for corrosivity, which are treated using elementary neutralization: The RLWTF has (1) a main treatment process for low-level RLW, (2) a process for treating transuranic RLW, and (3) a secondary treatment process for waste streams from both the low-level and transuranic processes.

1) The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. Process steps include treatment with chemicals in a reaction tank, filtration, ion exchange, and reverse osmosis.
   Discharge to the environment is via NPDES Outfall 051, solar evaporation at the TA-52 Zero Liquid Discharge (ZLD) Solar Evaporation Tanks or evaporation using natural gas at TA-50-257. Two secondary streams are generated by primary treatment, sludge and reverse osmosis concentrate; they are sent to the secondary treatment process.

2) Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant as a solid transuranic waste.

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A-9. Discharge Locations. List the locations of your facility and of all components of your processing, treatment, storage and/or disposal system. Examples of components include septic tanks, lagoons, leachfields, irrigation sites, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Latitude and longitude are optional unless township, range and section are not available.

Components	Township	Range	Section(s)	Latitude	Longitude
Natural Gas Evaporator (50-257)	19N	6E	22	35° 51' 43.4"	-106° 17' 51.8"
NPDES Outfall #051 (NM0028355)	19N	6E	22	35° 51' 54"	-106° 17' 52"
TA-52 Zero Liquid Discharge Solar Evaporation Tanks (currently under construction)	19N	6E	22	35° 51' 36"	-106° 17' 12"

B-12. Discharge Volumes. Describe how and where the monthly discharge volume at your facility will be. For all measuring devices, provide type, location, and units of measure including multipliers (e.g., gallons, gallons x 100, acre-ft, etc.) See Supplemental Instructions. Attach additional pages, if necessary.

Discharges of treated water to the environment are measured by the following methods:

- **Low-level influent**: Low-level RLW influent volumes will be determined by monitoring and recording the change in level of Tank 5 and Tank 6 in the Waste Management and Risk Mitigation (WMRM) Facility. While radioactive liquid waste (RLW) is being fed to the treatment process from one of these two influent tanks (e.g., Tank 5), fresh influent will be received in the other influent tank (e.g., Tank 6). In this illustration, the change in level of Tank 6 from one day to the next will reflect the volume of the influent received

.

- **Transuranic influent:** Transuranic influent is received in batches from TA-55, with influent collected in either the acid tank or caustic tank in Building 50-66. Level probes for these tanks are linked electronically to the RLWTF control room. Operators monitor and record tank level changes during each influent batch transfer. Influent volumes are calculated from the difference between beginning and ending tank levels.

- **Discharge to the environment by evaporation using natural gas at 50-257**: Treated water is fed to the evaporator from the effluent Frac tanks in Room 34B; water is typically fed continuously during the normal work week, including overnight. Volumes are read in gallons from a water meter on the evaporator feed line.

- **Discharge to the environment by solar evaporation**: Treated water is discharged to the TA-52 Zero Liquid Discharge Solar Evaporation Tanks from either of the effluent Frac tanks in Room 34B, or from TK38 in Room 38. Discharges occur in batches. The volume, in gallons, of each discharge is calculated from the change in tank level. If discharges are from the effluent Frac tanks, which are horizontal tanks, before- and after-discharge tank volumes are determined from a table that correlates tank level and volume of water in the tank. If discharges are from TK38, pre and post discharge tank volumes are read directly from markings on this translucent vertical tank.

- **Discharge to the environment via NPDES Outfall #051:** Treated water is discharged from either of the effluent Frac tanks in Room 34B, or from TK38 in Room 38. Discharges occur in batches. The volume, in gallons, of each discharge is calculated from the change in tank level. If discharges are from the effluent Frac tanks, which are horizontal tanks, before- and after-discharge tank volumes are determined from a table that correlates tank level and volume of water in the tank. If discharges are from TK38, pre and post discharge tank volumes are read directly from markings on this translucent vertical tank.

ENCLOSURE 2

Supplemental Information, DP-1132 Application

Revised Section B-7 – Redline

Revised Section B-7 – Final

ENV-RCRA-12-0173

LAUR-12-21591

Date: AUG 1 0 2012

B-7. Operational Plan. Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include stormwater management, nutrient management plans, method for mixing irrigation and wastewater.

Domestic wastewater treatment facilities: include pre-treatment, solids management, vegetation management for land application.

Facilities using reclaimed domestic wastewater above ground: include proposed water quality classification(s), effluent monitoring, setbacks, irrigation schedules, etc. that will result in protection of public health and the environment. Please refer to *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information. A copy of the guidance document is available on the NMED website www.nmenv.state.nm.us under "Ground Water Quality".

The process description and schematic of the Facility are located in Appendix B (February 16, 2012 Discharge Permit Application for the TA-50 RLWTF). Waste streams are characterized by RLW generators using acceptable EPA characterization methods (sampling and analysis, acceptable knowledge, or both); this characterization data is entered by the generator onto a Waste Profile Form (WPF). The WPF is reviewed by a Waste Management Coordinator, a RCRA subject-matter expert, and RLWTF staff. The waste stream is acceptable for discharge to and treatment at the RLWTF if reviewers approve the WPF.

Influent samples are periodically collected and analyzed at the RLWTF for inorganic and radioactive constituents, as a waste characterization overcheck. Samples of low-level RLW influent are also periodically submitted to an outside chemistry laboratory for analysis of organic constituents.

Generators of low-level RLW prepare and submit a WPF. Once the WPF is approved, the generator is approved to discharge the RLW as generated via the low-level collection system.

If the low-level RLW is to be sent to the RLWTF via truck, the generator must also prepare and submit a Waste Disposal Request form. The Waste Disposal Request is reviewed by a Waste Management Coordinator, transportation, and RLWTF personnel. The shipment is acceptable for transport to the RLWTF if reviewers approve the Waste Disposal Request.

Generators of transuranic RLW also prepare and submit a WPF. In this case, the generator must sample and analyze each batch of transuranic RLW, then submit a request to the RLWTF to transfer that batch to the RLWTF. If analytical results are acceptable, a date and time for transfer is agreed upon. The transfer is controlled by RLWTF personnel who direct TA-55 personnel when to unlock and open the transfer valves; they monitor the level of the acid

waste or caustic waste tank as the transfer is in progress. The TA-55 personnel are directed when to close and lock transfer valves. Transfer valves remain closed and locked until authorized by RLWTF to be opened.

Detailed operating procedures are required for each treatment unit. Procedures are drafted by operators and engineers, then reviewed and approved by safety personnel and management. Before becoming effective, procedures must also be walked down and verified by operators (e.g., valve numbers and sequences). Approved procedures are controlled documents, available at a controlled document website.

Detailed operating procedures follow a mandatory outline, which currently has the following required topics:

- safety and controls
- prerequisite actions (prior to startup)
- detailed operating instructions
- administrative sections such as introduction, definitions, acronyms, references, and record keeping

Detailed operating sections provide step-by-step instructions for operating the treatment equipment, and identify valves by valve number (valves within the facility are labeled), electrical switches by number (electrical components are labeled), and the sequence for opening and closing valves and starting and stopping equipment (e.g., mixers, pumps).

The table below lists procedures currently used for treatment operations at the RLWTF. (The list varies over time, but procedures always exist for each unit operation.)

Operators also inspect equipment each operating day, both informally (as they operate equipment) and formally (as documented on daily inspection round sheets). Inspections include tank level checks, pump operability, alarm tests (horns and lights), leak inspections, levels of combustibles and wastes, and other items. Results of the formal inspections are reviewed with and signed off by management, and corrective maintenance work orders are initiated for deficiencies.

RLWTF Detailed Operating Procedures

Unit Operation	Detailed Operating Procedures
Main Treatment:	
M1 Collection System	Annual Inspection of the RLW Collection System Vaults
M2 Influent Storage	RLWTF Tank Management Sampling at the RLWTF
M3 Emergency Influent Storage	WMRM Facility Status Change WMRM System Alignment Checklist Sampling WMRM Tanks Transferring RLW Form WMRM to RLWTF
M4 Reaction Tanks ~~Clarifiers~~	TK71 Operations TK72 Operations System Alignment Checklist for Reaction Tanks ~~Clarifiers, Gravity Filter, and Gravity Filter Bypass~~ ~~Clarifier Chemicals and NaOH Operations~~
M5 Microfilter ~~Gravity Filter~~	Microfilter Operations System Alignment Checklist for the Microfilter ~~Clarifiers, Gravity Filter, and Gravity Filter Bypass~~
M6 Pressure Filters	Pressure Filter Operations System Alignment Checklist for Pressure Filter Operations
M7 Perchlorate Ion Exchange	Re-Configure Flow Path through the IX Columns in Room 16
M8 Primary Reverse Osmosis	Reverse Osmosis Clean-in-Place System Membrane Maintenance
M9 Polishing Ion Exchange	System Alignment Checklist for RLWTF Effluent Disposition Ion Exchange Treatment of RLWTF Effluent
M10 Effluent Storage	System Alignment Checklist for RLWTF Effluent Disposition
M11 Solar Evaporation at TA-52	ZLD Facility Status Change Transferring Effluent: RLW to ZLD Tanks Sampling ZLD Tanks Transferring Effluent: ZLD Tanks to WMRM

M11 Outfall #051	Frac Tank Operations and Discharge of TK38 TK38 Operations
Transuranic:	
T1 Collection System	WM-201/66/107 System Alignment Checklist Transuranic RLW Transfers from TA-55 to TA-50
T2 Influent Storage	Sampling of the WM66 Influent Tanks
T3 Treatment	Room 60/60A System Alignment Checklist Acid Waste Treatment Caustic Waste Treatment Operations Back flushing the Pressure Filter
T4 Drum Tumbling	Sampling TK-7A, Sludge Mixing, and Sludge Rinsing Water Addition to TK-7A Drum Tumbler Operations
T5 Effluent Storage	Transferring Material from TK3 to the 3K Tank
Secondary Treatment:	
S1 Secondary Reverse Osmosis	Secondary RO Operations Secondary RO Cleaning and Maintenance
S2 Rotary Vacuum Filter	Vacuum Filter System
S3 Bottoms Storage	Sampling TK-SE Loading Evaporator Bottoms into a Tanker

☐ Operational plan is attached.

☐ Operational plan was previously submitted. Submittal date(s): ____________________

B-7. Operational Plan. Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include stormwater management, nutrient management plans, method for mixing irrigation and wastewater.

Domestic wastewater treatment facilities: include pre-treatment, solids management, vegetation management for land application.

Facilities using reclaimed domestic wastewater above ground: include proposed water quality classification(s), effluent monitoring, setbacks, irrigation schedules, etc. that will result in protection of public health and the environment. Please refer to *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information. A copy of the guidance document is available on the NMED website www.nmenv.state.nm.us under "Ground Water Quality".

The process description and schematic of the Facility are located in Appendix B (February 16, 2012 Discharge Permit Application for the TA-50 RLWTF). Waste streams are characterized by RLW generators using acceptable EPA characterization methods (sampling and analysis, acceptable knowledge, or both); this characterization data is entered by the generator onto a Waste Profile Form (WPF). The WPF is reviewed by a Waste Management Coordinator, a RCRA subject-matter expert, and RLWTF staff. The waste stream is acceptable for discharge to and treatment at the RLWTF if reviewers approve the WPF.

Influent samples are periodically collected and analyzed at the RLWTF for inorganic and radioactive constituents, as a waste characterization overcheck. Samples of low-level RLW influent are also periodically submitted to an outside chemistry laboratory for analysis of organic constituents.

Generators of low-level RLW prepare and submit a WPF. Once the WPF is approved, the generator is approved to discharge the RLW as generated via the low-level collection system.

If the low-level RLW is to be sent to the RLWTF via truck, the generator must also prepare and submit a Waste Disposal Request form. The Waste Disposal Request is reviewed by a Waste Management Coordinator, transportation, and RLWTF personnel. The shipment is acceptable for transport to the RLWTF if reviewers approve the Waste Disposal Request.

Generators of transuranic RLW also prepare and submit a WPF. In this case, the generator must sample and analyze each batch of transuranic RLW, then submit a request to the RLWTF to transfer that batch to the RLWTF. If analytical results are acceptable, a date and time for transfer is agreed upon. The transfer is controlled by RLWTF personnel who direct TA-55 personnel when to unlock and open the transfer valves; they monitor the level of the acid

waste or caustic waste tank as the transfer is in progress. The TA-55 personnel are directed when to close and lock transfer valves. Transfer valves remain closed and locked until authorized by RLWTF to be opened.

Detailed operating procedures are required for each treatment unit. Procedures are drafted by operators and engineers, then reviewed and approved by safety personnel and management. Before becoming effective, procedures must also be walked down and verified by operators (e.g., valve numbers and sequences). Approved procedures are controlled documents, available at a controlled document website.

Detailed operating procedures follow a mandatory outline, which currently has the following required topics:

- safety and controls
- prerequisite actions (prior to startup)
- detailed operating instructions
- administrative sections such as introduction, definitions, acronyms, references, and record keeping

Detailed operating sections provide step-by-step instructions for operating the treatment equipment, and identify valves by valve number (valves within the facility are labeled), electrical switches by number (electrical components are labeled), and the sequence for opening and closing valves and starting and stopping equipment (e.g., mixers, pumps).

The table below lists procedures currently used for treatment operations at the RLWTF. (The list varies over time, but procedures always exist for each unit operation.)

Operators also inspect equipment each operating day, both informally (as they operate equipment) and formally (as documented on daily inspection round sheets). Inspections include tank level checks, pump operability, alarm tests (horns and lights), leak inspections, levels of combustibles and wastes, and other items. Results of the formal inspections are reviewed with and signed off by management, and corrective maintenance work orders are initiated for deficiencies.

RLWTF Detailed Operating Procedures

Unit Operation	Detailed Operating Procedures
Main Treatment:	
M1 Collection System	Annual Inspection of the RLW Collection System Vaults
M2 Influent Storage	RLWTF Tank Management Sampling at the RLWTF
M3 Emergency Influent Storage	WMRM Facility Status Change WMRM System Alignment Checklist Sampling WMRM Tanks Transferring RLW Form WMRM to RLWTF
M4 Reaction Tanks	TK71 Operations TK72 Operations System Alignment Checklist for Reaction Tanks
M5 Microfilter	Microfilter Operations System Alignment Checklist for the Microfilter
M6 Pressure Filters	Pressure Filter Operations System Alignment Checklist for Pressure Filter Operations
M7 Perchlorate Ion Exchange	Re-Configure Flow Path through the IX Columns in Room 16
M8 Primary Reverse Osmosis	Reverse Osmosis Clean-in-Place System Membrane Maintenance
M9 Polishing Ion Exchange	System Alignment Checklist for RLWTF Effluent Disposition Ion Exchange Treatment of RLWTF Effluent
M10 Effluent Storage	System Alignment Checklist for RLWTF Effluent Disposition
M11 Solar Evaporation at TA-52	ZLD Facility Status Change Transferring Effluent: RLW to ZLD Tanks Sampling ZLD Tanks Transferring Effluent: ZLD Tanks to WMRM
M11 Outfall #051	Frac Tank Operations and Discharge of TK38 TK38 Operations

Transuranic:	
T1 Collection System	WM-201/66/107 System Alignment Checklist Transuranic RLW Transfers from TA-55 to TA-50
T2 Influent Storage	Sampling of the WM66 Influent Tanks
T3 Treatment	Room 60/60A System Alignment Checklist Acid Waste Treatment Caustic Waste Treatment Operations Back flushing the Pressure Filter
T4 Drum Tumbling	Sampling TK-7A, Sludge Mixing, and Sludge Rinsing Water Addition to TK-7A Drum Tumbler Operations
T5 Effluent Storage	Transferring Material from TK3 to the 3K Tank
Secondary Treatment:	
S1 Secondary Reverse Osmosis	Secondary RO Operations Secondary RO Cleaning and Maintenance
S2 Rotary Vacuum Filter	Vacuum Filter System
S3 Bottoms Storage	Sampling TK-SE Loading Evaporator Bottoms into a Tanker

☐ Operational plan is attached.

☐ Operational plan was previously submitted. Submittal date(s): ____________________

ENCLOSURE 3

Supplemental Information, DP-1132 Application

Revised RLWTF Processes and Units—Appendix B – Redline
Revised RLWTF Processes and Units—Appendix B – Final

ENV-RCRA-12-0173

LAUR-12-21591

Date: AUG 1 0 2012

Appendix B – TA-50 RLWTF Processes and Units

The Radioactive Liquid Waste Treatment Facility (RLWTF) consists of: (a) an underground collection system that conveys water to Technical Area (TA) 50 from generators at LANL, (b) structures at TA-50, and (c) the Zero Liquid Discharge Solar Evaporation Tanks at TA-52. At TA- 50, Building 50-01 is the primary structure; it houses treatment equipment, process tanks, analytical laboratories, and offices. Adjacent TA-50 structures primarily provide for additional water storage: ~~50-02 (influent),~~ 50-66 (influent), ~~50-90 (influent)~~, 50-248 (secondary waters), and 50-250 (influent and emergency~~emergency~~).

The RLWTF receives and treats radioactive liquid waste (RLW) from generators at Los Alamos National Laboratory. RLW includes small volumes, less than one percent of total influent, that are also characteristically hazardous for corrosivity, which are treated using elementary neutralization. The RLWTF has (1) a main treatment process for low-level RLW, (2) a process for treating transuranic RLW, and (3) a secondary treatment process for waste streams from both the low-level and transuranic processes. The units within each of these process lines are summarized in Table 1 and described in the paragraphs that follow. Table 2 provides additional information for each unit operation, including location, treatment and storage vessels, construction materials, and sizes.

Table 1: Summary of RLWTF Treatment Units

Unit Operation	Location
Main Treatment:	
M1 Collection System	TA-03, 35, 48, 50, 55, 59
M2 Influent Storage	~~50-02, 50-90~~ TA-50-250
M3 Emergency Influent Storage	50-250
M4 Reaction Tanks ~~Clarifiers~~	50-01
M5 Microfilter ~~Gravity Filter~~	50-01
M6 Pressure Filters	50-01
M7 Perchlorate Ion Exchange	50-01
M8 Primary Reverse Osmosis	50-01
M9 ~~Polishing~~ Cu-Zn Ion Exchange	50-01
M10 Effluent Storage	50-01, ~~50-02~~
M11 Effluent Evaporator	50-257
M11 ~~Zero Liquid Discharge~~ Solar Evaporation ~~Tanks~~	TA-52
M11 NPDES Outfall #051	Mortandad Canyon
Transuranic:	
T1 Collection System	TA-50, TA-55
T2 Influent Storage	50-66
T3 Treatment	50-01
T4 Drum Tumbling	50-01
T5 Effluent Storage	50-01
Secondary Treatment:	
S1 Secondary Reverse Osmosis	50-01
S2 Rotary Vacuum Filter	50-01
S3 Bottoms Disposal	50-248

MAIN TREATMENT PROCESS

The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. ~~Treatment~~ Process steps include treatment with chemicals in a reaction tank ~~clarification~~, filtration, ion exchange, and reverse osmosis. Discharge to the environment is via NPDES Outfall #051, solar evaporation at the TA-52 Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, or ~~mechanical~~ evaporation using natural gas at TA-50-257. Two secondary streams are generated by primary treatment, sludge and reverse osmosis concentrate; they are sent to the secondary treatment process.

M1. Radioactive Liquid Waste Collection System

The majority of RLW is transferred by direct pipeline between generator facilities and the RLWTF. The remaining RLW, typically less than 1,000 gallons per month, is transferred from small generators via truck. The pipeline system, installed in 1982, connects the TA-50 RLWTF to buildings in six TAs using approximately four miles of underground piping. Piping is essentially an underground pipeline within a pipeline. Primary piping is six- or eight-inch-diameter polyethylene encased within 10- or 12-inch polyethylene secondary piping. The primary piping transitions to stainless steel in each of the 62 underground valve stations (also referred to as vaults), then back to polyethylene. ~~Underground v~~Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room.

M2. Influent Storage

Influent flows from vault 50-72 through an underground, double-walled pipe, into two influent storage tanks in ~~the neutralization tank (TK-13) in Room 16 of TA-50-01, and then beneath the RLWTF into the influent tanks at~~ the basement of the Waste Management and Risk Mitigation (WMRM) Facility (50-250) ~~building 50-02~~. ~~There are two influent tanks, an in-ground concrete vessel with a capacity of 75,000 gallons, and a 17,000-gallon steel vessel set within a below-grade concrete containment vault.~~ Both are fiberglass, and each has a capacity of 50,000 gallons. ~~Influent may also be stored in Structure 50-90, which is an above-ground steel vessel with secondary containment and a capacity of 100,000 gallons. Low-level influent may be subjected to pH adjustment and/or oxidation. Typically, sodium hydroxide (25% solution) is used to adjust the influent pH; chemicals such as sodium permanganate may be used for oxidation. These two steps may be carried out in the neutralization tank, or the chemicals may be added directly to the influent tanks.~~ Influent is fed to the low-level treatment process in Building 50-01 via another underground, double-walled pipe.

M3. Emergency Influent Storage

Building 50-250, the Waste Management and Risk Mitigation (WMRM) facility, is located about 50 meters southeast of Building 50-01. WMRM houses six ~~emergency~~ influent storage tanks with a capacity of 50,000 gallons each; four of these are held in reserve for use in emergency situations. ~~Low-level influent can be shunted to these fiberglass tanks at vault 50-72, upstream of the 17K and 75K influent storage~~

~~tanks.~~ WMRM is a steel frame structure designed to withstand seismic, wind, and snow load criteria. The concrete basement houses the two influent and six emergency storage tanks, and acts as secondary containment. Tanks would receive influent by gravity flow from WM-72.

M4. Reaction Tanks ~~Clarifiers~~

Influent is mixed with treatment chemicals in the reaction tanks, TK71 and TK72, to remove insoluble constituents, including more than 90% of the radioactivity. There are two reaction tanks. Both are above-grade, carbon-steel vessels, ~10,000 gallons each. Influent and chemicals enter from above; the tank mixer brings the streams into contact. Chemicals such as sodium hydroxide, ferric sulfate, and magnesium sulfate are typically added to adjust pH, precipitate metals, and promote particle growth. Contaminants precipitate as sludge, which is kept in suspension by the tank mixer. The sludge-water mixture is fed to the next treatment step, the microfilter. ~~The clarifier acts as the workhorse of the Main Treatment Plant, removing insoluble constituents, including more than 90% of the radioactivity. There are two concrete clarifiers. Each is 20 feet in diameter with a working volume of about 20,000 gallons, and each is designed to operate at 120 gallons per minute. Influent and chemicals enter from above through a flash mixer into a center well. (Chemicals such as ferric sulfate and magnesium sulfate are added at the clarifier, to promote particle growth and to adjust pH.) Contaminants precipitate as sludge, which settles to the bottom of the clarifier. Treated waters flow to the bottom of the center well, rise in the outer portion of the clarifier, and overflow to the gravity filter. Sludge is periodically removed to TK8 for subsequent treatment in the rotary vacuum filter.~~

M5. Microfilter ~~Gravity~~ Filter

From the reaction tanks, treated influent is pumped to a microfilter to separate sludge from water. The microfilter employs polyvinylidene fluoride, or PVDF, membranes to separate solids from water. The membranes can withstand pH ranges from 0-14, are non-plugging, and are chlorine resistant; they remove particles as small as 0.1 micron, and can handle feed streams with up to 5% solids. A fully automatic backpulse of air periodically sends a reverse flow of filtrate across the membrane, dislodging contaminants and moving solids to the sludge tank. A clean-in-place system enables the periodic cleaning of membranes using acids, bases, or bleach.

Filtrate from the microfilter is fed to TK9, and from TK9 to either perchlorate ion exchange orf the primary reverse osmosis unit. Sludge from the microfilter is periodically removed to TK8 for subsequent treatment in the rotary vacuum filter.

~~The dual media gravity filter is used to remove suspended solids in overflow water from the clarifier. The gravity filter contains two filtration cells of 45 square feet each. The filter bed consists of layers of anthracite, sand, and gravel resting on an underdrain grate. Water flows by gravity into the top and exits at the bottom of the bed. Backwashing is needed periodically to remove solids and to reconstitute the~~

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~~bed. When properly maintained and operated, the gravity filter removes particles down to 10 microns in size. The gravity filter is sized to process up to 250 gallons of water per minute.~~

M6. Pressure Filters

Three pressure media filters, which operate in parallel or singly, can be used to remove suspended solids in water in the reaction tanks ~~from either the clarifier or the gravity filter~~. Water is pumped from either ~~two feed tanks,~~ TK71 or ~~and~~ TK72, through the media in an enclosed steel vessel at a pressure of about 30 psig. ~~Feed tanks are above grade, carbon-steel vessels, ~10,000 gallons each.~~ Pressure filters are 30 inches in diameter and ~five feet high, and are constructed of carbon steel lined with plasite (an epoxy). The media in the pressure filter consists of coarse and fine sized particles of sand, garnet, coal, and gravel. Backwashing is needed periodically to remove solids and to reconstitute the bed. Each filter can process up to 50 gallons per minute.

M7. Perchlorate Ion Exchange

Ion-exchange columns located in Room 16 are used to remove perchlorates. Six of the 12 fiberglass reinforced plastic (FRP) ion exchange vessels are typically in service. Vessels range in size to nine cubic feet of ion exchange resin, and can treat up to 60 gallons of water per minute. The columns are installed downstream of TK9, and prior to treatment by the Reverse Osmosis. TK9 is a 9000-gallon, carbon-steel, above-grade vessel located in Room 61. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.

M8. Primary Reverse Osmosis

The Reverse Osmosis unit removes soluble contaminants, and produces a high quality effluent that approaches and sometimes meets EPA primary drinking water standards. The Reverse Osmosis unit uses commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The unit has three 8-inch-diameter pressure vessels, and operates at pressures of about 400 psig. Each pressure vessel contains four membranes in series; each membrane is 40 inches in length. The Reverse Osmosis is a two-stage membrane unit; the third pressure vessel receives reject from the first two. Feed may first be pH-adjusted at the perchlorate ion exchange feed tank, TK-9. Permeate is sent to storage tanks in Room 34B; concentrate is ~~either recycled to the 75K influent storage tank, or~~ is processed through the secondary Reverse Osmosis unit. The primary Reverse Osmosis has a capacity up to 60 gallons per minute.

M9. Copper-Zinc Ion Exchange

NPDES Permit effluent limits for the discharge of treated water to NPDES Outfall #051 in Mortandad Canyon became more restrictive on 08-01-2010. As a result of acute aquatic life water quality standards being applied to ephemeral streams, discharge limits for copper and zinc were decreased to levels more than 2,000 times lower than EPA's secondary drinking water standards. In order to meet these new effluent limits, an ion exchange system was installed to polish permeate from the primary Reverse

Osmosis unit. The system consists of two banks; each bank has five 3.5-cubic foot fiberglass. The ion exchange system draws water from one of the Frac tanks that holds Reverse Osmosis permeate, pumps the water through one, or if needed, both ion exchange banks, and then into TK38. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.

M10. Effluent Storage

~~Five~~Three tanks are available for the storage of treated water. Two Frac tanks (north tank and south tank) receive permeate from the primary reverse osmosis unit. Frac tanks are horizontal carbon steel tanks located in Room 34B; each has a capacity of ~20,000 gallons. Water that receives post-Reverse Osmosis treatment (i.e., copper-zinc ion exchange) is collected in a 1000-gallon tank, TK38 in Room 38.~~,~~ TK38 is constructed of high-density polyethylene.. ~~Two additional storage tanks (WM2-N and WM2-S) are located in Building 50-02. These are below-grade concrete tanks with a nominal capacity of 25,000 gallons each.~~

M11. Discharge of Treated Water to the Environment

11a. Discharge Via ~~Mechanical~~ Effluent Evaporator ~~at TA-50-257~~ Using Natural Gas

Treated water may be discharged to the environment via an effluent ~~thermal~~ evaporator located outside Room 34 of Building 50-01. Water is heated using natural gas in a 4.5 million Btu/hr low NOx gas burner that can evaporate up to 400 gallons of water per hour. The unit is constructed of stainless steel, and has received a No Permit Required Determination from the NMED Air Quality Bureau.

11b. Discharge Via ~~Zero Liquid Discharge~~ Solar Evaporation ~~Tanks at TA52~~

Zero-Liquid-Discharge Solar Evaporation Tanks for solar evaporation of treated water are currently being constructed. The tanks are located on a site of approximately one acre, about two-thirds of a mile from the TA-50 RLWTF within TA-52 at LANL. The Zero Liquid Discharge Solar Evaporation Tanks have concrete walls approximately four feet high, and have a double liner with leak detection; each is approximately 70' x 250' in size, with a usable capacity of about 380,000 gallons. The pump house has the capability of returning the contents of the tanks to the TA-50 RLWTF for storage and retreatment, if necessary. Approximately 3500 feet of high-density polyethylene (HDPE) transfer piping connect the Zero Liquid Discharge Solar Evaporation Tanks and the TA-50 RLWTF.

11c. Discharge Via NPDES Outfall #051

Treated water that meets NPDES and DOE discharge standards can be discharged to the environment via NPDES Permitted Outfall #051 in Mortandad Canyon. Water is pumped to the outfall through approximately 1400 feet of three-inch-diameter, carbon steel pipe. NPDES samples are collected at TA-50 while water is discharging to the canyon.

TRANSURANIC TREATMENT PROCESS

Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant (WIPP) as a solid transuranic waste.

T1. Transuranic Collection System

The transuranic collection system runs from Building 55-04 through below-grade, double-contained transfer lines, through a valve pit ~~and vault~~ at 50-201, and into influent storage tanks at Building 50-66. One transfer line is dedicated for acid waste, and a second for caustic waste. Both are two-inch-diameter pipes. The acid waste lines are constructed of polyvinylidene fluoride (PVDF); the caustic lines are constructed of polypropylene (PP).

~~TRU wastewater is not freely drained to the RLWTF. Instead,~~ TA55 and RLWTF personnel coordinate batch wastewater transfers in advance. Once a transfer is coordinated, a batch of known volume, typically less than 100 gallons, is discharged through the system by gravity to the TRU influent storage tanks in Building 50-66. Transuranic influent is not trucked.

T2. Transuranic Influent Storage

Two influent storage tanks are located in Building 50-66, one for acid waste (~3900 gallons) and the other for caustic waste (~3000 gallons). Each tank has enough capacity to hold more than ~~two~~ one year~~s~~ of transuranic influent. Both tanks are cylindrical, cone-bottomed tanks, and each has a mixer~~,~~ and a HEPA-filtered vent. The sump in Building 50-66 has a leak detector that is linked to the RLWTF control room.

T3. Transuranic Treatment

Acid waste is pumped from Building 50-66 into TK1 in Room 60. The acid waste is neutralized by mixing it with liquid sodium hydroxide (nominal 25%). ~~C~~Other chemicals (ferric sulfate or polymer) may be added to promote particle growth. Solids that form in the neutralized waste settle, and are then pumped to the sludge tank, TK-7A. Clear liquid is pumped through a pressure filter into a receiving tank, TK3.

Caustic waste is pumped from Building 50-66 to Tank TK1 in Room 60, and then into the sludge-settling tank, TK-7A. The treated caustic waste is allowed to stand in the tank, which allows most of the solid particles to deposit on the bottom of the tank as sludge. In order to facilitate particle growth, TK-7A may be seeded with sludge left over from the previous treatment campaign. Chemicals (lime, ferric sulfate, or polymer) may also be added to TK-7A for this purpose.

T4. Transuranic Sludge

Sludge collects in TK-7A, a 900-gallon carbon-steel tank in Room 60. Excess water is decanted from TK-7A, then transferred to the effluent storage tank, TK3. The sludge itself is added to cement and sodium silicate, then tumbled and allowed to cure. After curing, drums of cemented sludge are transported to TA-54 to await shipment to and disposal at the Waste Isolation Pilot Plant as a solid transuranic waste.

T5. Transuranic Effluent

Effluent from the transuranic treatment process is collected in TK3 in Room 60, a 1000-gallon, horizontal fiberglass tank. Having been treated, effluent is no longer transuranic waste. The effluent either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms.

SECONDARY TREATMENT PROCESSES

The secondary treatment process treats wastes from the primary and transuranic treatment lines. It consists of a rotary vacuum filter to treat sludge from main process, secondary reverse osmosis to treat reverse osmosis concentrate from the main process and/or effluent from the transuranic process, and a bottoms disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

S1. Secondary Reverse Osmosis

These two Reverse Osmosis units, each with a capacity of up to five gallons per minute, recover much of the concentrate from the primary Reverse Osmosis unit, thereby reducing the volume of bottoms that must be disposed of. Effluent from the transuranic process may also be treated. Secondary Reverse Osmosis units use commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The units have two 4-inch-diameter pressure vessels, and operate at pressures of about ~~3~~200 psig. Each pressure vessel has a single membrane 40 inches in length. They are two-stage membrane units; the second pressure vessel receives reject from the first. Concentrate from the primary Reverse Osmosis unit is collected in TK73 (3700 gallons, lined steel), then fed to a smaller feed tank (300 gallons, polyethylene) in Room 24, adjacent to the secondary Reverse Osmosis (SRO) units. Permeate from the SRO is sent to the feed tank for the perchlorate ion exchange system (TK9), for re-treatment through the MTP. Reject is sent to storage tanks in Building 50-248 to await shipment as bottoms.

S2. Rotary Vacuum Filter

Solids ~~that settle to the bottom of the MTP clarifier~~ frm the microfilter (or pressure filters) are separated from water and then disposed as low-level radioactive solid waste. This sludge treatment operation includes the TK8 storage tank (capacity of 8,000 gallons) in Room 61 and the rotary vacuum filter in

Room 116. Low-level sludge contains more than 90% of the radioactivity present in low-level influent; it does not contain hazardous chemical constituents above RCRA limits, and is not a mixed waste.

S3. Bottoms ~~Disposal~~Storage

RLWTF bottoms are stored in tanks in Building 50-248 until shipped to a commercial waste treatment facility using a commercial tanker truck; shipments typically range from 4,000 to 5,000 gallons each. The commercial waste treatment facility processes bottoms to a solid form, and disposes of the solids as low-level radioactive waste at a Department of Energy or commercial disposal site.

Table 2: Vessel Information for RLWTF Treatment Units

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Main Treatment:						
M1 Collection System	Piping	—	Polyethylene	B	Polyethylene	
	Vaults (62)	—	Concrete	B	—	x
M2 Influent Storage	~~W5~~WMRM Tanks (2)	50,000	Fiberglass	B	Concrete	z
	~~TK13~~	~~400~~	~~Stainless Steel~~			
	~~W6~~	~~50,000~~	~~Fiberglass~~	~~B~~	~~Concrete~~	
	~~17K tank~~	~~17,000~~	~~Steel~~			
	~~75K tank~~	~~75,000~~	~~Concrete~~	B	—	
	~~100K tank~~	~~100,000~~	~~Steel~~	A	Concrete	
M3 Emergency Influent Storage	WMRM tanks (4 ~~6~~)	50,000	Fiberglass	B	Concrete	z
M4 Reaction Tanks	TK71, TK72	10,000	Steel	A	Concrete-w	v, z
~~Clarifiers~~	~~Clarifiers (2)~~	~~26,000~~	~~Concrete~~			
M5 Microfilter	Filter	40	Steel	A	Concrete-w	
~~Gravity Filter~~	Sludge tank	500	Polyethylene	A	Concrete-w	
	Cleaning tanks	200	Polyethylene	A	Concrete-w	z,
	~~Gravity Filter~~	~~7,000~~	~~Concrete~~	A	~~Concrete~~	v
M6 Pressure Filters	Filters (3)	100	Lined Steel	A	Concrete-w	z
	TK71, TK72	10,000	Steel	A	Concrete-w	z
M7 Perchlorate Ion Exchange	Ion Exchange Vessels(12)	50	Fiberglass	A	Concrete-w	z
	TK09	10,000	Steel	A	Concrete-w	
M8 Primary Reverse Osmosis	RO Vessel	40	Steel	A	Concrete-w	
M9 ~~Polishing~~ Cu-Zn Ion Exchange	Ion Exchange Columns (10)	200	Fiberglass	A	Concrete-w	
M10 Effluent Storage	N. Frac, S. Frac	20,000	Steel	A	Concrete-w	z
	TK-38	1,000	HDPE	A	Concrete-w	
	~~WM2-N, WM2-S~~	~~25,000~~	~~Concrete~~	~~B~~	~~—~~	~~z~~
M11 Effluent Evaporator	—	1,200	Stainless Steel	A	Hypalon, Asphalt	
M11 Solar Evaporation ~~at TA-52~~	E. Tank, W. Tank	380,000	HDPE	A	HDPE, Concrete	z
M12 NPDES Outfall #051	—	—	—	B	—	y

Notes:

v: Two concrete bottom slabs, with compacted tuff between.
w: Floor of Building 50-01, with floor drains, provides secondary containment.
x: Vaults provide secondary containment.
y: Pipe is below grade; the outfall is at the surface.
z: Capacity is for each vessel.

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Table 2: Vessel Information for RLWTF Treatment Units (Continued)

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Transuranic:						
T1 Collection System	Piping	----	PVDF , PP	B	PVDF, PP	
T2 Influent Storage	Acid Tank	3,900	Steel	B	Concrete	
	Caustic Tank	3,000	Steel	B	Concrete	
T3 Treatment	TK1	900	Steel	A	Concrete-w	
	TK2	800	Fiberglass	A	Concrete-w	
T4 Drum Tumbling	TK-7A	900	Steel	A	Concrete-w	
T5 Effluent Storage	TK3	1,000	Fiberglass	A	Concrete-w	
Secondary Treatment:						
S1 Secondary Reverse Osmosis	RO Vessel	10	Fiberglass	A	Concrete-w	
	~~TK2401~~ TK25	300	Polyethylene	A	Concrete-w	
	TK73	3,700	Steel	A	Concrete-w	
S2 Rotary Vacuum Filter	Rotary Vacuum Filter	900	Stainless Steel	A	Concrete-w	
	TK8	8,000	Steel	A	Concrete-w	
S3 Bottoms Storage	TK-NE, SE, SW, NW	20,000	Steel	A	Concrete	z
	3K tank	3,000	Steel	A	Concrete	
	17k tank	17,000	Steel	A	Concrete	

Notes:

w: Floor of Building 50-01, with floor drains, provides secondary containment.

Z: Capacity is for each vessel.

: 13305

Appendix B – TA-50 RLWTF Processes and Units

The Radioactive Liquid Waste Treatment Facility (RLWTF) consists of: (a) an underground collection system that conveys water to Technical Area (TA) 50 from generators at LANL, (b) structures at TA-50, and (c) the Zero Liquid Discharge Solar Evaporation Tanks at TA-52. At TA- 50, Building 50-01 is the primary structure; it houses treatment equipment, process tanks, analytical laboratories, and offices. Adjacent TA-50 structures primarily provide for additional water storage: 50-66 (influent), 50-248 (secondary waters), and 50-250 (influent and emergency).

The RLWTF receives and treats radioactive liquid waste (RLW) from generators at Los Alamos National Laboratory. RLW includes small volumes, less than one percent of total influent, that are also characteristically hazardous for corrosivity, which are treated using elementary neutralization. The RLWTF has (1) a main treatment process for low-level RLW, (2) a process for treating transuranic RLW, and (3) a secondary treatment process for waste streams from both the low-level and transuranic processes. The units within each of these process lines are summarized in Table 1 and described in the paragraphs that follow. Table 2 provides additional information for each unit operation, including location, treatment and storage vessels, construction materials, and sizes.

Table 1: Summary of RLWTF Treatment Units

Unit Operation	Location
Main Treatment:	
M1 Collection System	TA-03, 35, 48, 50, 55, 59
M2 Influent Storage	TA-50-250
M3 Emergency Influent Storage	50-250
M4 Reaction Tanks	50-01
M5 Microfilter	50-01
M6 Pressure Filters	50-01
M7 Perchlorate Ion Exchange	50-01
M8 Primary Reverse Osmosis	50-01
M9 Cu-Zn Ion Exchange	50-01
M10 Effluent Storage	50-01,
M11 Effluent Evaporator	50-257
M11 Solar Evaporation	TA-52
M11 NPDES Outfall #051	Mortandad Canyon
Transuranic:	
T1 Collection System	TA-50, TA-55
T2 Influent Storage	50-66
T3 Treatment	50-01
T4 Drum Tumbling	50-01
T5 Effluent Storage	50-01
Secondary Treatment:	
S1 Secondary Reverse Osmosis	50-01
S2 Rotary Vacuum Filter	50-01
S3 Bottoms Disposal	50-248

MAIN TREATMENT PROCESS

The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. Process steps include treatment with chemicals in a reaction tank, filtration, ion exchange, and reverse osmosis. Discharge to the environment is via NPDES Outfall #051, solar evaporation at the TA-52 Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, or evaporation using natural gas at TA-50-257. Two secondary streams are generated by primary treatment, sludge and reverse osmosis concentrate; they are sent to the secondary treatment process.

M1. Radioactive Liquid Waste Collection System

The majority of RLW is transferred by direct pipeline between generator facilities and the RLWTF. The remaining RLW, typically less than 1,000 gallons per month, is transferred from small generators via truck. The pipeline system, installed in 1982, connects the TA-50 RLWTF to buildings in six TAs using approximately four miles of underground piping. Piping is essentially an underground pipeline within a pipeline. Primary piping is six- or eight-inch-diameter polyethylene encased within 10- or 12-inch polyethylene secondary piping. The primary piping transitions to stainless steel in each of the 62 underground valve stations (also referred to as vaults), then back to polyethylene. Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room.

M2. Influent Storage

Influent flows from vault 50-72 through an underground, double-walled pipe, into two influent storage tanks in the basement of the Waste Management and Risk Mitigation (WMRM) Facility (50-250). Both are fiberglass, and each has a capacity of 50,000 gallons. Influent is fed to the low-level treatment process in Building 50-01 via another underground, double-walled pipe.

M3. Emergency Influent Storage

Building 50-250, the Waste Management and Risk Mitigation (WMRM) facility, is located about 50 meters southeast of Building 50-01. WMRM houses six influent storage tanks with a capacity of 50,000 gallons each; four of these are held in reserve for use in emergency situations. WMRM is a steel frame structure designed to withstand seismic, wind, and snow load criteria. The concrete basement houses the two influent and six emergency storage tanks, and acts as secondary containment. Tanks would receive influent by gravity flow from WM-72.

M4. Reaction Tanks

Influent is mixed with treatment chemicals in the reaction tanks, TK71 and TK72, to remove insoluble constituents, including more than 90% of the radioactivity. There are two reaction tanks. Both are above-grade, carbon-steel vessels, ~10,000 gallons each. Influent and chemicals enter from above; the tank mixer brings the streams into contact. Chemicals such as sodium hydroxide, ferric sulfate, and magnesium sulfate are typically added to adjust pH, precipitate metals, and promote particle growth. Contaminants precipitate as sludge, which is kept in suspension by the tank mixer. The sludge-water mixture is fed to the next treatment step, the microfilter.

M5. Microfilter Filter

From the reaction tanks, treated influent is pumped to a microfilter to separate sludge from water. The microfilter employs polyvinylidene fluoride, or PVDF, membranes to separate solids from water. The membranes can withstand pH ranges from 0-14, are non-plugging, and are chlorine resistant; they remove particles as small as 0.1 micron, and can handle feed streams with up to 5% solids. A fully automatic backpulse of air periodically sends a reverse flow of filtrate across the membrane, dislodging contaminants and moving solids to the sludge tank. A clean-in-place system enables the periodic cleaning of membranes using acids, bases, or bleach.

Filtrate from the microfilter is fed to TK9, and then from TK9 to either perchlorate ion exchange or the primary reverse osmosis unit. Sludge from the microfilter is periodically removed to TK8 for subsequent treatment in the rotary vacuum filter.

M6. Pressure Filters

Three pressure media filters, which operate in parallel or singly, can be used to remove suspended solids in water in the reaction tanks. Water is pumped from either TK71 or TK72, through the media in an enclosed steel vessel at a pressure of about 30 psig. Pressure filters are 30 inches in diameter and ~five feet high, and are constructed of carbon steel lined with plasite (an epoxy). The media in the pressure filter consists of coarse and fine sized particles of sand, garnet, coal, and gravel. Backwashing is needed periodically to remove solids and to reconstitute the bed. Each filter can process up to 50 gallons per minute.

M7. Perchlorate Ion Exchange

Ion-exchange columns located in Room 16 are used to remove perchlorates. Six of the 12 fiberglass reinforced plastic (FRP) ion exchange vessels are typically in service. Vessels range in size to nine cubic feet of ion exchange resin, and can treat up to 60 gallons of water per minute. The columns are installed downstream of TK9, and prior to treatment by the Reverse Osmosis. TK9 is a 9000-gallon, carbon-steel, above-grade vessel located in Room 61. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.

M8. Primary Reverse Osmosis

The Reverse Osmosis unit removes soluble contaminants, and produces a high quality effluent that approaches and sometimes meets EPA primary drinking water standards. The Reverse Osmosis unit uses commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The unit has three 8-inch-diameter pressure vessels, and operates at pressures of about 400 psig. Each pressure vessel contains four membranes in series; each membrane is 40 inches in length. The Reverse Osmosis is a two-stage membrane unit; the third pressure vessel receives reject from the first two. Feed may first be pH-adjusted at the perchlorate ion exchange feed tank, TK-9. Permeate is sent to storage tanks in Room 34B; concentrate is processed through the secondary Reverse Osmosis (SRO) unit. The primary Reverse Osmosis has a capacity up to 60 gallons per minute.

M9. Copper-Zinc Ion Exchange

NPDES Permit effluent limits for the discharge of treated water to NPDES Outfall #051 in Mortandad Canyon became more restrictive on 08-01-2010. As a result of acute aquatic life water quality standards being applied to ephemeral streams, discharge limits for copper and zinc were decreased to levels more than 2,000 times lower than EPA's secondary drinking water standards. In order to meet these new effluent limits, an ion exchange system was installed to polish permeate from the primary Reverse Osmosis unit. The system consists of two banks; each bank has five 3.5-cubic foot fiberglass. The ion exchange system draws water from one of the Frac tanks that holds Reverse Osmosis permeate, pumps the water through one, or if needed, both ion exchange banks, and then into TK38. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.

M10. Effluent Storage

Three tanks are available for the storage of treated water. Two Frac tanks (north tank and south tank) receive permeate from the primary reverse osmosis unit. Frac tanks are horizontal carbon steel tanks located in Room 34B; each has a capacity of ~20,000 gallons. Water that receives post-Reverse Osmosis treatment (i.e., copper-zinc ion exchange) is collected in a 1000-gallon tank, TK38 in Room 38. TK38 is constructed of high-density polyethylene.

M11. Discharge of Treated Water to the Environment

11a. Discharge Via Effluent Evaporator Using Natural Gas

Treated water may be discharged to the environment via an effluent evaporator located outside Room 34 of Building 50-01. Water is heated using natural gas in a 4.5 million Btu/hr low NOx gas burner that can evaporate up to 400 gallons of water per hour. The unit is constructed of stainless steel, and has received a No Permit Required Determination from the NMED Air Quality Bureau.

11b. Discharge Via Solar Evaporation

Zero-Liquid-Discharge Solar Evaporation Tanks for solar evaporation of treated water are currently being constructed. The tanks are located on a site of approximately one acre, about two-thirds of a mile from the TA-50 RLWTF within TA-52 at LANL. The Zero Liquid Discharge Solar Evaporation Tanks have concrete walls approximately four feet high, and have a double liner with leak detection; each is approximately 70' x 250' in size, with a usable capacity of about 380,000 gallons. The pump house has the capability of returning the contents of the tanks to the TA-50 RLWTF for storage and retreatment, if necessary. Approximately 3500 feet of high-density polyethylene (HDPE) transfer piping connect the Zero Liquid Discharge Solar Evaporation Tanks and the TA-50 RLWTF.

11c. Discharge Via NPDES Outfall #051

Treated water that meets NPDES and DOE discharge standards can be discharged to the environment via NPDES Permitted Outfall #051 in Mortandad Canyon. Water is pumped to the outfall through approximately 1400 feet of three-inch-diameter, carbon steel pipe. NPDES samples are collected at TA-50 while water is discharging to the canyon.

TRANSURANIC TREATMENT PROCESS

Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant (WIPP) as a solid transuranic waste.

T1. Transuranic Collection System

The transuranic collection system runs from Building 55-04 through below-grade, double-contained transfer lines, through a valve pit at 50-201, and into influent storage tanks at Building 50-66. One transfer line is dedicated for acid waste, and a second for caustic waste. Both are two-inch-diameter pipes. The acid waste lines are constructed of polyvinylidene fluoride (PVDF); the caustic lines are constructed of polypropylene (PP).

TA55 and RLWTF personnel coordinate batch wastewater transfers in advance. Once a transfer is coordinated, a batch of known volume, typically less than 100 gallons, is discharged through the system by gravity to the TRU influent storage tanks in Building 50-66. Transuranic influent is not trucked.

T2. Transuranic Influent Storage

Two influent storage tanks are located in Building 50-66, one for acid waste (~3900 gallons) and the other for caustic waste (~3000 gallons). Each tank has enough capacity to hold more than one year of transuranic influent. Both tanks are cylindrical, cone-bottomed tanks, and each has a mixer and a HEPA-filtered vent. The sump in Building 50-66 has a leak detector that is linked to the RLWTF control room.

T3. Transuranic Treatment

Acid waste is pumped from Building 50-66 into TK1 in Room 60. The acid waste is neutralized by mixing it with liquid sodium hydroxide (nominal 25%). Other chemicals (ferric sulfate or polymer) may be added to promote particle growth. Solids that form in the neutralized waste settle, and are then pumped to the sludge tank, TK-7A. Clear liquid is pumped through a pressure filter into a receiving tank, TK3.

Caustic waste is pumped from Building 50-66 to Tank TK1 in Room 60, and then into the sludge-settling tank, TK-7A. The treated caustic waste is allowed to stand in the tank, which allows most of the solid particles to deposit on the bottom of the tank as sludge. In order to facilitate particle growth, TK-7A may be seeded with sludge left over from the previous treatment campaign. Chemicals (lime, ferric sulfate, or polymer) may also be added to TK-7A for this purpose.

T4. Transuranic Sludge

Sludge collects in TK-7A, a 900-gallon carbon-steel tank in Room 60. Excess water is decanted from TK-7A, then transferred to the effluent storage tank, TK3. The sludge itself is added to cement and sodium silicate, then tumbled and allowed to cure. After curing, drums of cemented sludge are transported to TA-54 to await shipment to and disposal at the Waste Isolation Pilot Plant as a solid transuranic waste.

T5. Transuranic Effluent

Effluent from the transuranic treatment process is collected in TK3 in Room 60, a 1000-gallon, horizontal fiberglass tank. Having been treated, effluent is no longer transuranic waste. The effluent either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms.

SECONDARY TREATMENT PROCESSES

The secondary treatment process treats wastes from the primary and transuranic treatment lines. It consists of a rotary vacuum filter to treat sludge from main process, secondary reverse osmosis to treat reverse osmosis concentrate from the main process and/or effluent from the transuranic process, and a bottoms disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

S1. Secondary Reverse Osmosis

These two Reverse Osmosis units, each with a capacity of up to five gallons per minute, recover much of the concentrate from the primary Reverse Osmosis unit, thereby reducing the volume of bottoms that must be disposed of. Effluent from the transuranic process may also be treated. Secondary Reverse Osmosis units use commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The units have two 4-inch-diameter pressure vessels, and operate at pressures of about 200 psig. Each pressure vessel has a single membrane 40 inches in length. They are two-stage membrane units; the second pressure vessel receives reject from the first. Concentrate from the primary Reverse Osmosis unit is collected in TK73 (3700 gallons, lined steel), then fed to a smaller feed tank (300 gallons, polyethylene) in Room 24, adjacent to the secondary Reverse Osmosis (SRO) units. Permeate from the SRO is sent to the feed tank for the perchlorate ion exchange system (TK9), for re-treatment through the MTP. Reject is sent to storage tanks in Building 50-248 to await shipment as bottoms.

S2. Rotary Vacuum Filter

Solids from the microfilter (or pressure filters) are separated from water and then disposed as low-level radioactive solid waste. This sludge treatment operation includes the TK8 storage tank (capacity of 8,000 gallons) in Room 61 and the rotary vacuum filter in Room 116. Low-level sludge contains more than 90% of the radioactivity present in low-level influent; it does not contain hazardous chemical constituents above RCRA limits, and is not a mixed waste.

S3. Bottoms Storage

RLWTF bottoms are stored in tanks in Building 50-248 until shipped to a commercial waste treatment facility using a commercial tanker truck; shipments typically range from 4,000 to 5,000 gallons each. The commercial waste treatment facility processes bottoms to a solid form, and disposes of the solids as low-level radioactive waste at a Department of Energy or commercial disposal site.

Table 2: Vessel Information for RLWTF Treatment Units

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Main Treatment:						
M1 Collection System	Piping	—	Polyethylene	B	Polyethylene	
	Vaults (62)	—	Concrete	B	—	x
M2 Influent Storage	WMRM Tanks (2)	50,000	Fiberglass	B	Concrete	z
M3 Emergency Influent Storage	WMRM tanks (4)	50,000	Fiberglass	B	Concrete	z
M4 Reaction Tanks	TK71, TK72	10,000	Steel	A	Concrete-w	z
M5 Microfilter	Filter	40	Steel	A	Concrete-w	
	Sludge tank	500	Polyethylene	A	Concrete-w	
	Cleaning tanks	200	Polyethylene	A	Concrete-w	z
M6 Pressure Filters	Filters (3)	100	Lined Steel	A	Concrete-w	z
	TK71, TK72	10,000	Steel	A	Concrete-w	z
M7 Perchlorate Ion Exchange	Ion Exchange Vessels (12)	50	Fiberglass	A	Concrete-w	z
	TK09	10,000	Steel	A	Concrete-w	
M8 Primary Reverse Osmosis	RO Vessel	40	Steel	A	Concrete-w	
M9 Cu-Zn Ion Exchange	Ion Exchange Columns (10)	200	Fiberglass	A	Concrete-w	
M10 Effluent Storage	N. Frac, S. Frac	20,000	Steel	A	Concrete-w	z
	TK-38	1,000	HDPE	A	Concrete-w	
M11 Effluent Evaporator	—	1,200	Stainless Steel	A	Hypalon, Asphalt	
M11 Solar Evaporation	E. Tank, W. Tank	380,000	HDPE	A	HDPE, Concrete	z
M12 NPDES Outfall #051	—	—	—	B	—	y

Notes:

v: Two concrete bottom slabs, with compacted tuff between.
w: Floor of Building 50-01, with floor drains, provides secondary containment.
x: Vaults provide secondary containment.
y: Pipe is below grade; the outfall is at the surface.
z: Capacity is for each vessel.

Table 2: Vessel Information for RLWTF Treatment Units (Continued)

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Transuranic:						
T1 Collection System	Piping	----	PVDF , PP	B	PVDF, PP	
T2 Influent Storage	Acid Tank	3,900	Steel	B	Concrete	
	Caustic Tank	3,000	Steel	B	Concrete	
T3 Treatment	TK1	900	Steel	A	Concrete-w	
	TK2	800	Fiberglass	A	Concrete-w	
T4 Drum Tumbling	TK-7A	900	Steel	A	Concrete-w	
T5 Effluent Storage	TK3	1,000	Fiberglass	A	Concrete-w	
Secondary Treatment:						
S1 Secondary Reverse Osmosis	RO Vessel	10	Fiberglass	A	Concrete-w	
	TK25	300	Polyethylene	A	Concrete-w	
	TK73	3,700	Steel	A	Concrete-w	
S2 Rotary Vacuum Filter	Rotary Vacuum Filter	900	Stainless Steel	A	Concrete-w	
	TK8	8,000	Steel	A	Concrete-w	
S3 Bottoms Storage	TK-NE, SE, SW, NW	20,000	Steel	A	Concrete	z
	3K tank	3,000	Steel	A	Concrete	
	17k tank	17,000	Steel	A	Concrete	

Notes:

w: Floor of Building 50-01, with floor drains, provides secondary containment.

Z: Capacity is for each vessel.

13315

ENCLOSURE 4

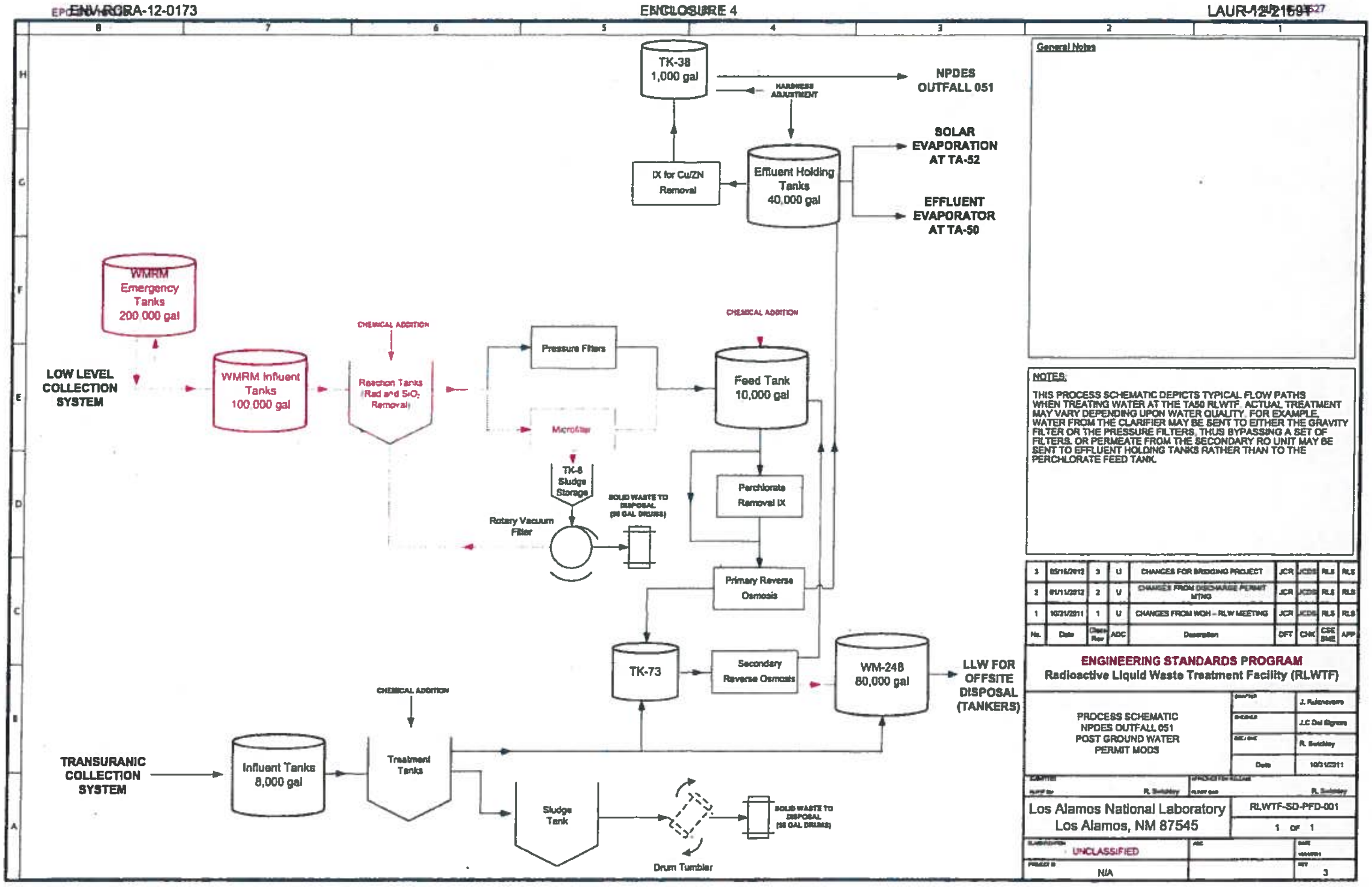
Supplemental Information, DP-1132 Application

Revised Process Schematic—Appendix B

ENV-RCRA-12-0173

LAUR-12-21591

Date: AUG 1 0 2012


TK-38
1,000 gal
NPDES
OUTFALL 051
HARDNESS ADJUSTMENT
IX for Cu/ZN Removal
Effluent Holding Tanks
40,000 gal
SOLAR
EVAPORATION
AT TA-52
EFFLUENT
EVAPORATOR
AT TA-50
WMRM
Emergency
Tanks
200,000 gal
LOW LEVEL
COLLECTION
SYSTEM
WMRM Influent
Tanks
100,000 gal
CHEMICAL ADDITION
Reaction Tanks
(Rad and SiO_2 Removal)
Pressure Filters
Microfilter
CHEMICAL ADDITION
Feed Tank
10,000 gal
TK-8
Sludge
Storage
SOLID WASTE TO DISPOSAL (55 GAL DRUMS)
Rotary Vacuum Filter
Perchlorate Removal IX
Primary Reverse Osmosis
TK-73
Secondary Reverse Osmosis
WM-248
80,000 gal
LLW FOR
OFFSITE
DISPOSAL
(TANKERS)
CHEMICAL ADDITION
TRANSURANIC
COLLECTION
SYSTEM
Influent Tanks
8,000 gal
Treatment Tanks
Sludge Tank
SOLID WASTE TO DISPOSAL (55 GAL DRUMS)
Drum Tumbler
General Notes
NOTES:
THIS PROCESS SCHEMATIC DEPICTS TYPICAL FLOW PATHS WHEN TREATING WATER AT THE TA50 RLWTF. ACTUAL TREATMENT MAY VARY DEPENDING UPON WATER QUALITY. FOR EXAMPLE, WATER FROM THE CLARIFIER MAY BE SENT TO EITHER THE GRAVITY FILTER OR THE PRESSURE FILTERS, THUS BYPASSING A SET OF FILTERS. OR PERMEATE FROM THE SECONDARY RO UNIT MAY BE SENT TO EFFLUENT HOLDING TANKS RATHER THAN TO THE PERCHLORATE FEED TANK.
3 05/15/2012 3 U CHANGES FOR BRIDGING PROJECT JCR JCDS RLS RLS
2 01/11/2012 2 U CHANGES FROM DISCHARGE PERMIT MTNG JCR JCDS RLS RLS
1 10/31/2011 1 U CHANGES FROM WOH – RLW MEETING JCR JCDS RLS RLS
No. Date Class Rev ADC Description DFT CHK CSE SME APP
ENGINEERING STANDARDS PROGRAM
Radioactive Liquid Waste Treatment Facility (RLWTF)
PROCESS SCHEMATIC
NPDES OUTFALL 051
POST GROUND WATER
PERMIT MODS
J. Rubinovero
J.C Del Signore
R. Switchley
Date 10/31/2011
R. Switchley
R. Switchley
Los Alamos National Laboratory
Los Alamos, NM 87545
RLWTF-SD-PFD-001
1 OF 1
UNCLASSIFIED
N/A
3

13317

ENCLOSURE 5

Supplemental Information, DP-1132 Application
Revised Scaled Floor Plan—Appendix B

ENV-RCRA-12-0173

LAUR-12-21591

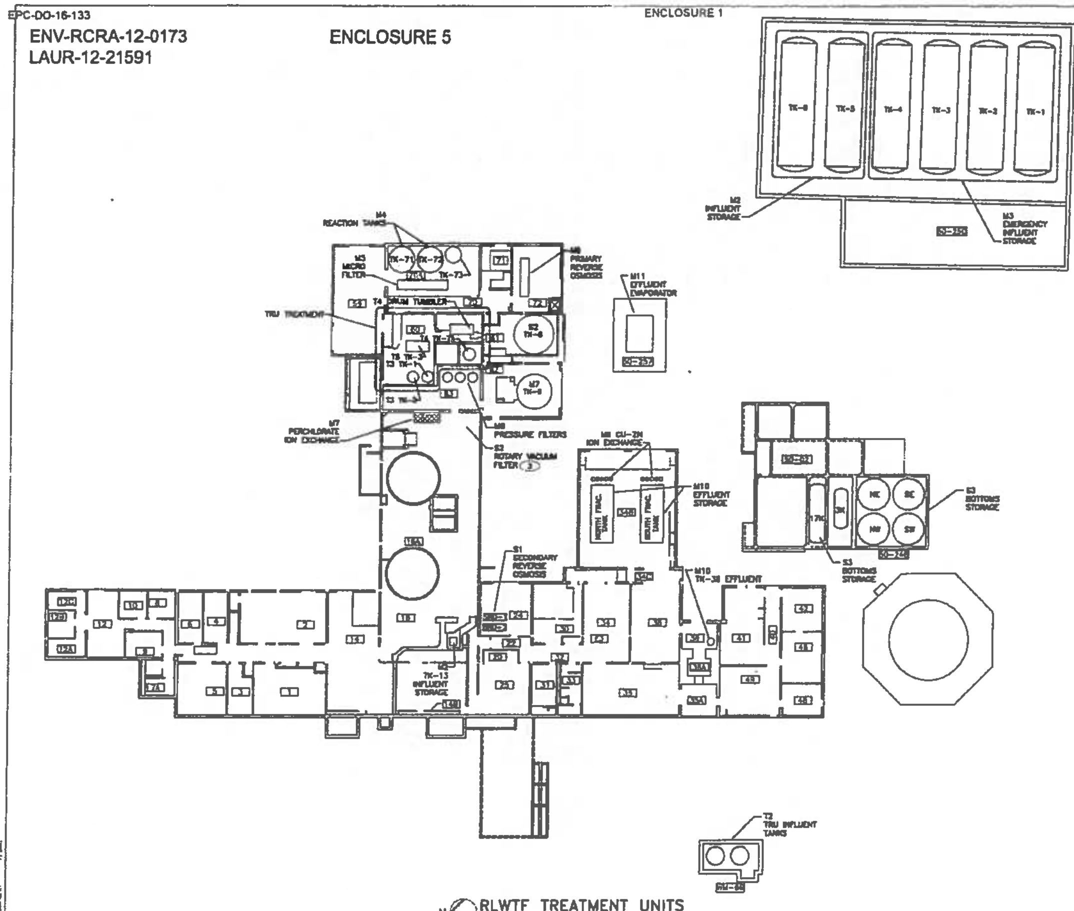
Date: AUG 1 0 2012

EPC-DO-16-133

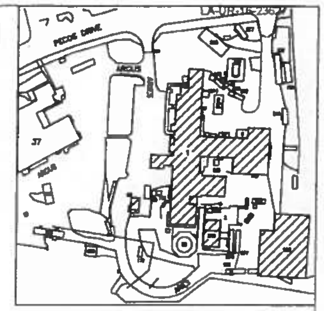
ENCLOSURE 1

ENV-RCRA-12-0173
LAUR-12-21591

ENCLOSURE 5



RLWTF TREATMENT UNITS
SCALE: 1/8" = 4'-4" (1)



LOCATION PLAN
SCALE: NONE TA-50

GENERAL NOTES

1. IF THIS SHEET IS NOT 11X17, THEN IT IS A REDUCED OR ENLARGED SIZE PLOT. USE INDICATED SCALE ACCORDINGLY.

KEYED NOTES

(1) SCALE APPLIES TO BUILDING STRUCTURES AND RELATIVE BUILDING LOCATIONS WITHIN THE SITE. DEPICTED SIZE OF TREATMENT UNITS AND STORAGE TANKS ARE FOR REFERENCE ONLY.

(2) TREATMENT UNIT NOT SHOWN ON SKETCH.

(3) ROTARY VACUUM FILTER LOCATED THIS AREA SOUTH-EAST CORNER RM. 118A

	RLWTF TREATMENT UNITS	
(2)	M1	COLLECTION SYSTEM
	M2	INFLUENT STORAGE
	M3	EMERGENCY INFLUENT STORAGE
	M4	REACTION TANKS
	M5	MICRO FILTER
	M6	PRESSURE FILTERS
	M7	PERCHLORATE ION EXCHANGE
	M8	PRIMARY REVERSE OSMOSIS
	M9	COPPER ZINC ION EXCHANGE
	M10	EFFLUENT STORAGE
	M11	EFFLUENT EVAPORATOR
(2)	M11	SOLAR EVAPORATION
(2)	M11	NPDES OUTFALL #051
(2)	T1	TRU COLLECTION SYSTEM
	T2	TRU INFLUENT STORAGE
	T3	TRU TREATMENT
	T4	TRU SLUDGE
	T5	TRU EFFLUENT
	S1	SECONDARY REVERSE OSMOSIS
(3)	S2	ROTARY VACUUM FILTER
	S3	BOTTOMS STORAGE

Los Alamos
NATIONAL LABORATORY
EST.1943

COPY

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: AUG 1 0 2012
Refer To: ENV-RCRA-12-0173
LAUR: 12-21591

GROUND WATER
AUG 10 2012
BUREAU

Mr. Jerry Schoeppner, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Mr. Schoeppner:

SUBJECT: SUPPLEMENTAL INFORMATION FOR DISCHARGE PERMIT APPLICATION DP-1132, RADIOACTIVE LIQUID WASTE TREATMENT FACILITY (RLWTF) AND ZERO LIQUID DISCHARGE (ZLD) SOLAR EVAPORATION TANKS

On November 18, 2011, the New Mexico Environment Department (NMED) notified the U. S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) that a comprehensive, up-to-date application was required to issue Discharge Permit (DP)-1132 for the Technical Area 50 (TA-50) Radioactive Liquid Waste Treatment Facility and the TA-52 Zero Liquid Discharge Solar Evaporation Tanks. A Discharge Permit application (ENV-DO-12-0005) and supplement (ENV-DO-12-0019) were submitted to NMED by DOE/LANS on February 16, 2012, and April 2, 2012, respectively. After the above-referenced application and supplement were submitted, DOE/LANS confirmed that they could replace seven vessels at the TA-50 RLWTF with two new storage tank systems with leak detection capability located at the TA-50 Waste Mitigation and Risk Management (WMRM) Facility. This significant and improved change requires DOE/LANS to submit the enclosed supplement and modification to its existing permit application.

Los Alamos NATIONAL LABORATORY EST 1943

Signature/Review/Coordination Sheet

This form is to accompany all documents requiring review, approval, or signature by the Laboratory Director or Designee.

Date 7/19/12	Deadline NA	Is this a response to an action item? Yes ☐ No ☒
From: ENV-RCRA Name: Robert S. Beers MS: K490		☒ Call for Pick-up Name: Linda M. Salazar Phone: 7-7407

Title: Identify document, briefly describing subject matter.

ENV-RCRA-12-0173 Supplemental Information for Discharge Permit Application DP-1132

☐ Action ☒ Information Only

Background/Issues:

At the NMED's request, in February 2012 the Laboratory submitted a new Discharge Permit Application for the TA-50 RLWTF and the TA-52 ZLD Solar Evaporation Tanks. Subsequent to the application's submittal and in conjunction with settlement negotiations between the DOJ, NMED, and DOE/LANS, the Laboratory agreed to remove 7 RLWTF tanks without secondary containment from service and replace them with two of the WMRM tanks. These changes are being communicated to the NMED in this letter and enclosures.

Routine Report.

The date is left blank on this correspondence pending routing approval and will be stamped before release

ACTION requested of Laboratory Director or Designee:

Review and Endorse

Approved by Craig Leasure 8/9/12

PAD Endorsement

Name (print)	Signature	Date
Carl A. Beard For		8/9/12

AD Endorsement

Name (print)	Signature	Date
Michael T. Brandt		8/8/12

Coordinated with

Name (print)	Signature	Date
1. Alison M. Dorries		8/7/12
2. Anthony R. Grieggs	ARG	8/6/12
3. Susan L. McMichael	See attached email	
4. Clifford W. Kirkland		8/2/12
5. Michael T. Saladen/Robert S. Beers	7/23/12	7/24/12

Please ensure appropriate inter/intra Directorate/Divisional coordination and review prior to submittal to the Director's Office.

Form 1824 (1/07)

PADOPS 061 8/8/12

13321

ENCLOSURE 2

Revised Section B-7 – Redline
Revised Section B-7 – Final

EPC-CP-16-133

LA-UR-16-23627

Date: JUN 0 3 2016

13322

B-7. Operational Plan. Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include stormwater management, nutrient management plans, method for mixing irrigation and wastewater.

Domestic wastewater treatment facilities: include pre-treatment, solids management, vegetation management for land application.

Facilities using reclaimed domestic wastewater above ground: include proposed water quality classification(s), effluent monitoring, setbacks, irrigation schedules, etc. that will result in protection of public health and the environment. Please refer to *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information. A copy of the guidance document is available on the NMED website www.nmenv.state.nm.us under "Ground Water Quality".

The process description and schematic of the Facility are located in Appendix B (February 16, 2012 Discharge Permit Application for the TA-50 RLWTF). Waste streams are characterized by RLW generators using acceptable EPA characterization methods (sampling and analysis, acceptable knowledge, or both); this characterization data is entered by the generator onto a Waste Profile Form (WPF). The WPF is reviewed by a Waste Management Coordinator, a RCRA subject-matter expert, and RLWTF staff. The waste stream is acceptable for discharge to and treatment at the RLWTF if reviewers approve the WPF.

Influent samples are periodically collected and analyzed at the RLWTF for inorganic and radioactive constituents, as a waste characterization overcheck. Samples of low-level RLW influent are also periodically submitted to an outside chemistry laboratory for analysis of organic constituents.

Generators of low-level RLW prepare and submit a WPF. Once the WPF is approved, the generator is approved to discharge the RLW as generated via the low-level collection system.

If the low-level RLW is to be sent to the RLWTF via truck, the generator must also prepare and submit a Waste Disposal Request form. The Waste Disposal Request is reviewed by a Waste Management Coordinator, transportation, and RLWTF personnel. The shipment is acceptable for transport to the RLWTF if reviewers approve the Waste Disposal Request.

Generators of transuranic RLW also prepare and submit a WPF. In this case, the generator must sample and analyze each batch of transuranic RLW, then submit a request to the RLWTF to transfer that batch to the RLWTF. If analytical results are acceptable, a date and time for transfer is agreed upon. The transfer is controlled by RLWTF personnel who direct TA-55 personnel when to unlock and open the transfer valves; they monitor the level of the acid

waste or caustic waste tank as the transfer is in progress. The TA-55 personnel are directed when to close and lock transfer valves. Transfer valves remain closed and locked until authorized by RLWTF to be opened.

Detailed operating procedures are required for each treatment unit. Procedures are drafted by operators and engineers, then reviewed and approved by safety personnel and management. Before becoming effective, procedures must also be walked down and verified by operators (e.g., valve numbers and sequences). Approved procedures are controlled documents, available at a controlled document website.

Detailed operating procedures follow a mandatory outline, which currently has the following required topics:

- safety and controls
- prerequisite actions (prior to startup)
- detailed operating instructions
- administrative sections such as introduction, definitions, acronyms, references, and record keeping

Detailed operating sections provide step-by-step instructions for operating the treatment equipment, and identify valves by valve number (valves within the facility are labeled), electrical switches by number (electrical components are labeled), and the sequence for opening and closing valves and starting and stopping equipment (e.g., mixers, pumps).

The table below lists procedures currently used for treatment operations at the RLWTF. (The list varies over time, but procedures always exist for each unit operation.)

Operators also inspect equipment each operating day, both informally (as they operate equipment) and formally (as documented on daily inspection round sheets). Inspections include tank level checks, pump operability, alarm tests (horns and lights), leak inspections, levels of combustibles and wastes, and other items. Results of the formal inspections are reviewed with and signed off by management, and corrective maintenance work orders are initiated for deficiencies.

RLWTF Detailed Operating Procedures

Unit Operation	Detailed Operating Procedures
Main Treatment:	
M1 Collection System	Annual Inspection of the RLW Collection System Vaults
M2 Influent Storage	RLWTF Tank Management Sampling at the RLWTF
M3 Emergency Influent Storage	WMRM Facility Status Change WMRM System Alignment Checklist Sampling WMRM Tanks Transferring RLW Form WMRM to RLWTF
M4 Reaction Tanks	TK71 Operations TK72 Operations System Alignment Checklist for Reaction Tanks
M5 Microfilter	Microfilter Operations System Alignment Checklist for the Microfilter
M6 Pressure Filters	Pressure Filter Operations System Alignment Checklist for Pressure Filter Operations
M7 Perchlorate Ion Exchange	Re-Configure Flow Path through the IX Columns in Room 16
M8 Primary Reverse Osmosis	Reverse Osmosis Clean-in-Place System Membrane Maintenance
~~M9 Polishing Ion Exchange~~	~~System Alignment Checklist for RLWTF Effluent Disposition~~ ~~Ion Exchange Treatment of RLWTF Effluent~~
M10 Effluent Storage	System Alignment Checklist for RLWTF Effluent Disposition
M11 Solar Evaporation at TA-52	ZLD Facility Status Change Transferring Effluent: RLW to ZLD Tanks Sampling ZLD Tanks Transferring Effluent: ZLD Tanks to WMRM
M11 Outfall #051	Frac Tank Operations and Discharge of TK38 TK38 Operations

Transuranic:	
T1 Collection System	WM-201/66/107 System Alignment Checklist Transuranic RLW Transfers from TA-55 to TA-50
T2 Influent Storage	Sampling of the WM66 Influent Tanks
T3 Treatment	Room 60/60A System Alignment Checklist Acid Waste Treatment Caustic Waste Treatment Operations Back flushing the Pressure Filter
T4 Drum Tumbling	Sampling TK-7A, Sludge Mixing, and Sludge Rinsing Water Addition to TK-7A Drum Tumbler Operations
T5 Effluent Storage	Transferring Material from TK3 to the 3K Tank
Secondary Treatment:	
S1 Secondary Reverse Osmosis	Secondary RO Operations Secondary RO Cleaning and Maintenance
S2 Rotary Vacuum Filter	Vacuum Filter System
S3 Bottoms Storage	Sampling TK-SE Loading Evaporator Bottoms into a Tanker

☐ Operational plan is attached.

☐ Operational plan was previously submitted. Submittal date(s): ____________________

B-7. Operational Plan. Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include stormwater management, nutrient management plans, method for mixing irrigation and wastewater.

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waste or caustic waste tank as the transfer is in progress. The TA-55 personnel are directed when to close and lock transfer valves. Transfer valves remain closed and locked until authorized by RLWTF to be opened.

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M4 Reaction Tanks	TK71 Operations TK72 Operations System Alignment Checklist for Reaction Tanks
M5 Microfilter	Microfilter Operations System Alignment Checklist for the Microfilter
M6 Pressure Filters	Pressure Filter Operations System Alignment Checklist for Pressure Filter Operations
M7 Perchlorate Ion Exchange	Re-Configure Flow Path through the IX Columns in Room 16
M8 Primary Reverse Osmosis	Reverse Osmosis Clean-in-Place System Membrane Maintenance
M9 RESERVED	
M10 Effluent Storage	System Alignment Checklist for RLWTF Effluent Disposition
M11 Solar Evaporation at TA-52	ZLD Facility Status Change Transferring Effluent: RLW to ZLD Tanks Sampling ZLD Tanks Transferring Effluent: ZLD Tanks to WMRM
M11 Outfall #051	Frac Tank Operations and Discharge of TK38 TK38 Operations

Transuranic:	
T1 Collection System	WM-201/66/107 System Alignment Checklist Transuranic RLW Transfers from TA-55 to TA-50
T2 Influent Storage	Sampling of the WM66 Influent Tanks
T3 Treatment	Room 60/60A System Alignment Checklist Acid Waste Treatment Caustic Waste Treatment Operations Back flushing the Pressure Filter
T4 Drum Tumbling	Sampling TK-7A, Sludge Mixing, and Sludge Rinsing Water Addition to TK-7A Drum Tumbler Operations
T5 Effluent Storage	Transferring Material from TK3 to the 3K Tank
Secondary Treatment:	
S1 Secondary Reverse Osmosis	Secondary RO Operations Secondary RO Cleaning and Maintenance
S2 Rotary Vacuum Filter	Vacuum Filter System
S3 Bottoms Storage	Sampling TK-SE Loading Evaporator Bottoms into a Tanker

☐ Operational plan is attached.

☐ Operational plan was previously submitted. Submittal date(s): ____________________

ENCLOSURE 3

Revised RLWTF Processes and Units—Appendix B – Redline
Revised RLWTF Processes and Units—Appendix B – Final

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Appendix B – TA-50 RLWTF Processes and Units

The Radioactive Liquid Waste Treatment Facility (RLWTF) consists of: (a) an underground collection system that conveys water to Technical Area (TA) 50 from generators at LANL, (b) structures at TA-50, and (c) the Zero Liquid Discharge Solar Evaporation Tanks at TA-52. At TA- 50, Building 50-01 is the primary structure; it houses treatment equipment, process tanks, analytical laboratories, and offices. Adjacent TA-50 structures primarily provide for additional water storage: 50-66 (influent), 50-248 (secondary waters), and 50-250 (influent and emergency).

The RLWTF receives and treats radioactive liquid waste (RLW) from generators at Los Alamos National Laboratory. RLW includes small volumes, less than one percent of total influent, that are also characteristically hazardous for corrosivity, which are treated using elementary neutralization. The RLWTF has (1) a main treatment process for low-level RLW, (2) a process for treating transuranic RLW, and (3) a secondary treatment process for waste streams from both the low-level and transuranic processes. The units within each of these process lines are summarized in Table 1 and described in the paragraphs that follow. Table 2 provides additional information for each unit operation, including location, treatment and storage vessels, construction materials, and sizes.

Table 1: Summary of RLWTF Treatment Units

Unit Operation	Location
Main Treatment:	
M1 Collection System	TA-03, 35, 48, 50, 55, 59
M2 Influent Storage	TA-50-250
M3 Emergency Influent Storage	50-250
M4 Reaction Tanks	50-01
M5 Microfilter	50-01
M6 Pressure Filters	50-01
M7 Perchlorate Ion Exchange	50-01
M8 Primary Reverse Osmosis	50-01
~~M9 Cu-Zn Ion Exchange~~	~~50-01~~
M10 Effluent Storage	50-01,
M11 Effluent Evaporator	50-257
M11 Solar Evaporation	TA-52
M11 NPDES Outfall #051	Mortandad Canyon
Transuranic:	
T1 Collection System	TA-50, TA-55
T2 Influent Storage	50-66
T3 Treatment	50-01
T4 Drum Tumbling	50-01
T5 Effluent Storage	50-01
Secondary Treatment:	
S1 Secondary Reverse Osmosis	50-01
S2 Rotary Vacuum Filter	50-01
S3 Bottoms Disposal	50-248

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MAIN TREATMENT PROCESS

The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. Process steps include treatment with chemicals in a reaction tank, filtration, ion exchange, and reverse osmosis. Discharge to the environment is via NPDES Outfall #051, solar evaporation at the TA-52 Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, or evaporation using natural gas at TA-50-257. Two secondary streams are generated by primary treatment, sludge and reverse osmosis concentrate; they are sent to the secondary treatment process.

M1. Radioactive Liquid Waste Collection System

The majority of RLW is transferred by direct pipeline between generator facilities and the RLWTF. The remaining RLW, typically less than 1,000 gallons per month, is transferred from small generators via truck. The pipeline system, installed in 1982, connects the TA-50 RLWTF to buildings in six TAs using approximately four miles of underground piping. Piping is essentially an underground pipeline within a pipeline. Primary piping is six- or eight-inch-diameter polyethylene encased within 10- or 12-inch polyethylene secondary piping. The primary piping transitions to stainless steel in each of the 62 underground valve stations (also referred to as vaults), then back to polyethylene. Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room.

M2. Influent Storage

Influent flows from vault 50-72 through an underground, double-walled pipe, into two influent storage tanks in the basement of the Waste Management and Risk Mitigation (WMRM) Facility (50-250). Both are fiberglass, and each has a capacity of 50,000 gallons. Influent is fed to the low-level treatment process in Building 50-01 via another underground, double-walled pipe.

M3. Emergency Influent Storage

Building 50-250, the Waste Management and Risk Mitigation (WMRM) facility, is located about 50 meters southeast of Building 50-01. WMRM houses six influent storage tanks with a capacity of 50,000 gallons each; four of these are held in reserve for use in emergency situations. WMRM is a steel frame structure designed to withstand seismic, wind, and snow load criteria. The concrete basement houses the two influent and six emergency storage tanks, and acts as secondary containment. Tanks would receive influent by gravity flow from WM-72.

M4. Reaction Tanks

Influent is mixed with treatment chemicals in the reaction tanks, TK71 and TK72, to remove insoluble constituents, including more than 90% of the radioactivity. There are two reaction tanks. Both are above-grade, carbon-steel vessels, ~10,000 gallons each. Influent and chemicals enter from above; the tank mixer brings the streams into contact. Chemicals such as sodium hydroxide, ferric sulfate, and magnesium sulfate are typically added to adjust pH, precipitate metals, and promote particle growth. Contaminants precipitate as sludge, which is kept in suspension by the tank mixer. The sludge-water mixture is fed to the next treatment step, the microfilter.

M5. Microfilter Filter

From the reaction tanks, treated influent is pumped to a microfilter to separate sludge from water. The microfilter employs polyvinylidene fluoride, or PVDF, membranes to separate solids from water. The membranes can withstand pH ranges from 0-14, are non-plugging, and are chlorine resistant; they remove particles as small as 0.1 micron, and can handle feed streams with up to 5% solids. A fully automatic backpulse of air periodically sends a reverse flow of filtrate across the membrane, dislodging contaminants and moving solids to the sludge tank. A clean-in-place system enables the periodic cleaning of membranes using acids, bases, or bleach.

Filtrate from the microfilter is fed to TK9, and then from TK9 to either perchlorate ion exchange or the primary reverse osmosis unit. Sludge from the microfilter is periodically removed to TK8 for subsequent treatment in the rotary vacuum filter.

M6. Pressure Filters

Three pressure media filters, which operate in parallel or singly, can be used to remove suspended solids in water in the reaction tanks. Water is pumped from either TK71 or TK72, through the media in an enclosed steel vessel at a pressure of about 30 psig. Pressure filters are 30 inches in diameter and ~five feet high, and are constructed of carbon steel lined with plasite (an epoxy). The media in the pressure filter consists of coarse and fine sized particles of sand, garnet, coal, and gravel. Backwashing is needed periodically to remove solids and to reconstitute the bed. Each filter can process up to 50 gallons per minute.

M7. Perchlorate Ion Exchange

Ion-exchange columns located in Room 16 are used to remove perchlorates. Six of the 12 fiberglass reinforced plastic (FRP) ion exchange vessels are typically in service. Vessels range in size to nine cubic feet of ion exchange resin, and can treat up to 60 gallons of water per minute. The columns are installed downstream of TK9, and prior to treatment by the Reverse Osmosis. TK9 is a 9000-gallon, carbon-steel, above-grade vessel located in Room 61. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.

M8. Primary Reverse Osmosis

The Reverse Osmosis unit removes soluble contaminants, and produces a high quality effluent that approaches and sometimes meets EPA primary drinking water standards. The Reverse Osmosis unit uses commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The unit has three 8-inch-diameter pressure vessels, and operates at pressures of about 400 psig. Each pressure vessel contains four membranes in series; each membrane is 40 inches in length. The Reverse Osmosis is a two-stage membrane unit; the third pressure vessel receives reject from the first two. Feed may first be pH-adjusted at the perchlorate ion exchange feed tank, TK-9. Permeate is sent to storage tanks in Room 34B; concentrate is processed through the secondary Reverse Osmosis (SRO) unit. The primary Reverse Osmosis has a capacity up to 60 gallons per minute.

~~**M9. Copper-Zinc Ion Exchange**~~

~~NPDES Permit effluent limits for the discharge of treated water to NPDES Outfall #051 in Mortandad Canyon became more restrictive on 08-01-2010. As a result of acute aquatic life water quality standards being applied to ephemeral streams, discharge limits for copper and zinc were decreased to levels more than 2,000 times lower than EPA's secondary drinking water standards. In order to meet these new effluent limits, an ion exchange system was installed to polish permeate from the primary Reverse Osmosis unit. The system consists of two banks; each bank has five 3.5-cubic foot fiberglass. The ion exchange system draws water from one of the Frac tanks that holds Reverse Osmosis permeate, pumps the water through one, or if needed, both ion exchange banks, and then into TK38. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.~~

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M10. Effluent Storage

Three tanks are available for the storage of treated water. Two Frac tanks (north tank and south tank) receive permeate from the primary reverse osmosis unit. Frac tanks are horizontal carbon steel tanks located in Room 34B; each has a capacity of ~20,000 gallons. Water that receives post-Reverse Osmosis treatment (i.e., copper-zinc ion exchange) is collected in a 1000-gallon tank, TK38 in Room 38. TK38 is constructed of high-density polyethylene.

M11. Discharge of Treated Water to the Environment

11a. Discharge Via Effluent Evaporator Using Natural Gas

Treated water may be discharged to the environment via an effluent evaporator located outside Room 34 of Building 50-01. Water is heated using natural gas in a 4.5 million Btu/hr low NOx gas burner that can evaporate up to 400 gallons of water per hour. The unit is constructed of stainless steel, and has received a No Permit Required Determination from the NMED Air Quality Bureau.

11b. Discharge Via Solar Evaporation

Zero-Liquid-Discharge Solar Evaporation Tanks for solar evaporation of treated water are currently being constructed. The tanks are located on a site of approximately one acre, about two-thirds of a mile from the TA-50 RLWTF within TA-52 at LANL. The Zero Liquid Discharge Solar Evaporation Tanks have concrete walls approximately four feet high, and have a double liner with leak detection; each is approximately 70' x 250' in size, with a usable capacity of about 380,000 gallons. The pump house has the capability of returning the contents of the tanks to the TA-50 RLWTF for storage and retreatment, if necessary. Approximately 3500 feet of high-density polyethylene (HDPE) transfer piping connect the Zero Liquid Discharge Solar Evaporation Tanks and the TA-50 RLWTF.

11c. Discharge Via NPDES Outfall #051

Treated water that meets NPDES and DOE discharge standards can be discharged to the environment via NPDES Permitted Outfall #051 in Mortandad Canyon. Water is pumped to the outfall through approximately 1400 feet of three-inch-diameter, carbon steel pipe. NPDES samples are collected at TA-50 while water is discharging to the canyon.

TRANSURANIC TREATMENT PROCESS

Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant (WIPP) as a solid transuranic waste.

T1. Transuranic Collection System

The transuranic collection system runs from Building 55-04 through below-grade, double-contained transfer lines, through a valve pit at 50-201, and into influent storage tanks at Building 50-66. One transfer line is dedicated for acid waste, and a second for caustic waste. Both are two-inch-diameter pipes. The acid waste lines are constructed of polyvinylidene fluoride (PVDF); the caustic lines are constructed of polypropylene (PP).

TA55 and RLWTF personnel coordinate batch wastewater transfers in advance. Once a transfer is coordinated, a batch of known volume, typically less than 100 gallons, is discharged through the system by gravity to the TRU influent storage tanks in Building 50-66. Transuranic influent is not trucked.

T2. Transuranic Influent Storage

Two influent storage tanks are located in Building 50-66, one for acid waste (~3900 gallons) and the other for caustic waste (~3000 gallons). Each tank has enough capacity to hold more than one year of transuranic influent. Both tanks are cylindrical, cone-bottomed tanks, and each has a mixer and a HEPA-filtered vent. The sump in Building 50-66 has a leak detector that is linked to the RLWTF control room.

T3. Transuranic Treatment

Acid waste is pumped from Building 50-66 into TK1 in Room 60. The acid waste is neutralized by mixing it with liquid sodium hydroxide (nominal 25%). Other chemicals (ferric sulfate or polymer) may be added to promote particle growth. Solids that form in the neutralized waste settle, and are then pumped to the sludge tank, TK-7A. Clear liquid is pumped through a pressure filter into a receiving tank, TK3.

Caustic waste is pumped from Building 50-66 to Tank TK1 in Room 60, and then into the sludge-settling tank, TK-7A. The treated caustic waste is allowed to stand in the tank, which allows most of the solid particles to deposit on the bottom of the tank as sludge. In order to facilitate particle growth, TK-7A may be seeded with sludge left over from the previous treatment campaign. Chemicals (lime, ferric sulfate, or polymer) may also be added to TK-7A for this purpose.

T4. Transuranic Sludge

Sludge collects in TK-7A, a 900-gallon carbon-steel tank in Room 60. Excess water is decanted from TK-7A, then transferred to the effluent storage tank, TK3. The sludge itself is added to cement and sodium silicate, then tumbled and allowed to cure. After curing, drums of cemented sludge are transported to TA-54 to await shipment to and disposal at the Waste Isolation Pilot Plant as a solid transuranic waste.

T5. Transuranic Effluent

Effluent from the transuranic treatment process is collected in TK3 in Room 60, a 1000-gallon, horizontal fiberglass tank. Having been treated, effluent is no longer transuranic waste. The effluent either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms.

<u>SECONDARY TREATMENT PROCESSES</u>

The secondary treatment process treats wastes from the primary and transuranic treatment lines. It consists of a rotary vacuum filter to treat sludge from main process, secondary reverse osmosis to treat reverse osmosis concentrate from the main process and/or effluent from the transuranic process, and a bottoms disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

S1. Secondary Reverse Osmosis

These two Reverse Osmosis units, each with a capacity of up to five gallons per minute, recover much of the concentrate from the primary Reverse Osmosis unit, thereby reducing the volume of bottoms that must be disposed of. Effluent from the transuranic process may also be treated. Secondary Reverse Osmosis units use commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The units have two 4-inch-diameter pressure vessels, and operate at pressures of about 200 psig. Each pressure vessel has a single membrane 40 inches in length. They are two-stage membrane units; the second pressure vessel receives reject from the first. Concentrate from the primary Reverse Osmosis unit is collected in TK73 (3700 gallons, lined steel), then fed to a smaller feed tank (300 gallons, polyethylene) in Room 24, adjacent to the secondary Reverse Osmosis (SRO) units. Permeate from the SRO is sent to the feed tank for the perchlorate ion exchange system (TK9), for re-treatment through the MTP. Reject is sent to storage tanks in Building 50-248 to await shipment as bottoms.

S2. Rotary Vacuum Filter

Solids from the microfilter (or pressure filters) are separated from water and then disposed as low-level radioactive solid waste. This sludge treatment operation includes the TK8 storage tank (capacity of 8,000 gallons) in Room 61 and the rotary vacuum filter in Room 116. Low-level sludge contains more than 90% of the radioactivity present in low-level influent; it does not contain hazardous chemical constituents above RCRA limits, and is not a mixed waste.

S3. Bottoms Storage

RLWTF bottoms are stored in tanks in Building 50-248 until shipped to a commercial waste treatment facility using a commercial tanker truck; shipments typically range from 4,000 to 5,000 gallons each. The commercial waste treatment facility processes bottoms to a solid form, and disposes of the solids as low-level radioactive waste at a Department of Energy or commercial disposal site.

Table 2: Vessel Information for RLWTF Treatment Units

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Main Treatment:						
M1 Collection System	Piping	----	Polyethylene	B	Polyethylene	
	Vaults (62)	----	Concrete	B	----	x
M2 Influent Storage	WMRM Tanks (2)	50,000	Fiberglass	B	Concrete	z
M3 Emergency Influent Storage	WMRM tanks (4)	50,000	Fiberglass	B	Concrete	z
M4 Reaction Tanks	TK71, TK72	10,000	Steel	A	Concrete-w	z
M5 Microfilter	Filter	40	Steel	A	Concrete-w	
	Sludge tank	500	Polyethylene	A	Concrete-w	
	Cleaning tanks	200	Polyethylene	A	Concrete-w	z
M6 Pressure Filters	Filters (3)	100	Lined Steel	A	Concrete-w	z
	TK71, TK72	10,000	Steel	A	Concrete-w	z
M7 Perchlorate Ion Exchange	Ion Exchange Vessels (12)	50	Fiberglass	A	Concrete-w	z
	TK09	10,000	Steel	A	Concrete-w	
M8 Primary Reverse Osmosis	RO Vessel	40	Steel	A	Concrete-w	
~~M9 Cu-Zn Ion Exchange~~	~~Ion Exchange Columns (10)~~	~~200~~	~~Fiberglass~~	~~A~~	~~Concrete-w~~	
M10 Effluent Storage	N. Frac, S. Frac	20,000	Steel	A	Concrete-w	z
	TK-38	1,000	HDPE	A	Concrete-w	
M11 Effluent Evaporator	----	1,200	Stainless Steel	A	Hypalon, Asphalt	
M11 Solar Evaporation	E. Tank, W. Tank	380,000	HDPE	A	HDPE, Concrete	z
M12 NPDES Outfall #051	----	----	----	B	----	y

Notes:

v: Two concrete bottom slabs, with compacted tuff between.
w: Floor of Building 50-01, with floor drains, provides secondary containment.
x: Vaults provide secondary containment.
y: Pipe is below grade; the outfall is at the surface.
z: Capacity is for each vessel.

Table 2: Vessel Information for RLWTF Treatment Units (Continued)

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Transuranic:						
T1 Collection System	Piping	—	PVDF , PP	B	PVDF, PP	
T2 Influent Storage	Acid Tank	3,900	Steel	B	Concrete	
	Caustic Tank	3,000	Steel	B	Concrete	
T3 Treatment	TK1	900	Steel	A	Concrete-w	
	TK2	800	Fiberglass	A	Concrete-w	
T4 Drum Tumbling	TK-7A	900	Steel	A	Concrete-w	
T5 Effluent Storage	TK3	1,000	Fiberglass	A	Concrete-w	
Secondary Treatment:						
S1 Secondary Reverse Osmosis	RO Vessel	10	Fiberglass	A	Concrete-w	
	TK25	300	Polyethylene	A	Concrete-w	
	TK73	3,700	Steel	A	Concrete-w	
S2 Rotary Vacuum Filter	Rotary Vacuum Filter	900	Stainless Steel	A	Concrete-w	
	TK8	8,000	Steel	A	Concrete-w	
S3 Bottoms Storage	TK-NE, SE, SW, NW	20,000	Steel	A	Concrete	z
	3K tank	3,000	Steel	A	Concrete	
	17k tank	17,000	Steel	A	Concrete	

Notes:

w: Floor of Building 50-01, with floor drains, provides secondary containment.

Z: Capacity is for each vessel.

Appendix B – TA-50 RLWTF Processes and Units

The Radioactive Liquid Waste Treatment Facility (RLWTF) consists of: (a) an underground collection system that conveys water to Technical Area (TA) 50 from generators at LANL, (b) structures at TA-50, and (c) the Zero Liquid Discharge Solar Evaporation Tanks at TA-52. At TA- 50, Building 50-01 is the primary structure; it houses treatment equipment, process tanks, analytical laboratories, and offices. Adjacent TA-50 structures primarily provide for additional water storage: 50-66 (influent), 50-248 (secondary waters), and 50-250 (influent and emergency).

The RLWTF receives and treats radioactive liquid waste (RLW) from generators at Los Alamos National Laboratory. RLW includes small volumes, less than one percent of total influent, that are also characteristically hazardous for corrosivity, which are treated using elementary neutralization. The RLWTF has (1) a main treatment process for low-level RLW, (2) a process for treating transuranic RLW, and (3) a secondary treatment process for waste streams from both the low-level and transuranic processes. The units within each of these process lines are summarized in Table 1 and described in the paragraphs that follow. Table 2 provides additional information for each unit operation, including location, treatment and storage vessels, construction materials, and sizes.

Table 1: Summary of RLWTF Treatment Units

Unit Operation	Location
Main Treatment:	
M1 Collection System	TA-03, 35, 48, 50, 55, 59
M2 Influent Storage	TA-50-250
M3 Emergency Influent Storage	50-250
M4 Reaction Tanks	50-01
M5 Microfilter	50-01
M6 Pressure Filters	50-01
M7 Perchlorate Ion Exchange	50-01
M8 Primary Reverse Osmosis	50-01
M9 RESERVED	
M10 Effluent Storage	50-01,
M11 Effluent Evaporator	50-257
M11 Solar Evaporation	TA-52
M11 NPDES Outfall #051	Mortandad Canyon
Transuranic:	
T1 Collection System	TA-50, TA-55
T2 Influent Storage	50-66
T3 Treatment	50-01
T4 Drum Tumbling	50-01
T5 Effluent Storage	50-01
Secondary Treatment:	
S1 Secondary Reverse Osmosis	50-01
S2 Rotary Vacuum Filter	50-01
S3 Bottoms Disposal	50-248

MAIN TREATMENT PROCESS

The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. Process steps include treatment with chemicals in a reaction tank, filtration, ion exchange, and reverse osmosis. Discharge to the environment is via NPDES Outfall #051, solar evaporation at the TA-52 Zero Liquid Discharge (ZLD) Solar Evaporation Tanks, or evaporation using natural gas at TA-50-257. Two secondary streams are generated by primary treatment, sludge and reverse osmosis concentrate; they are sent to the secondary treatment process.

M1. Radioactive Liquid Waste Collection System

The majority of RLW is transferred by direct pipeline between generator facilities and the RLWTF. The remaining RLW, typically less than 1,000 gallons per month, is transferred from small generators via truck. The pipeline system, installed in 1982, connects the TA-50 RLWTF to buildings in six TAs using approximately four miles of underground piping. Piping is essentially an underground pipeline within a pipeline. Primary piping is six- or eight-inch-diameter polyethylene encased within 10- or 12-inch polyethylene secondary piping. The primary piping transitions to stainless steel in each of the 62 underground valve stations (also referred to as vaults), then back to polyethylene. Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room.

M2. Influent Storage

Influent flows from vault 50-72 through an underground, double-walled pipe, into two influent storage tanks in the basement of the Waste Management and Risk Mitigation (WMRM) Facility (50-250). Both are fiberglass, and each has a capacity of 50,000 gallons. Influent is fed to the low-level treatment process in Building 50-01 via another underground, double-walled pipe.

M3. Emergency Influent Storage

Building 50-250, the Waste Management and Risk Mitigation (WMRM) facility, is located about 50 meters southeast of Building 50-01. WMRM houses six influent storage tanks with a capacity of 50,000 gallons each; four of these are held in reserve for use in emergency situations. WMRM is a steel frame structure designed to withstand seismic, wind, and snow load criteria. The concrete basement houses the two influent and six emergency storage tanks, and acts as secondary containment. Tanks would receive influent by gravity flow from WM-72.

M4. Reaction Tanks

Influent is mixed with treatment chemicals in the reaction tanks, TK71 and TK72, to remove insoluble constituents, including more than 90% of the radioactivity. There are two reaction tanks. Both are above-grade, carbon-steel vessels, ~10,000 gallons each. Influent and chemicals enter from above; the tank mixer brings the streams into contact. Chemicals such as sodium hydroxide, ferric sulfate, and magnesium sulfate are typically added to adjust pH, precipitate metals, and promote particle growth. Contaminants precipitate as sludge, which is kept in suspension by the tank mixer. The sludge-water mixture is fed to the next treatment step, the microfilter.

M5. Microfilter Filter

From the reaction tanks, treated influent is pumped to a microfilter to separate sludge from water. The microfilter employs polyvinylidene fluoride, or PVDF, membranes to separate solids from water. The membranes can withstand pH ranges from 0-14, are non-plugging, and are chlorine resistant; they remove particles as small as 0.1 micron, and can handle feed streams with up to 5% solids. A fully automatic backpulse of air periodically sends a reverse flow of filtrate across the membrane, dislodging contaminants and moving solids to the sludge tank. A clean-in-place system enables the periodic cleaning of membranes using acids, bases, or bleach.

Filtrate from the microfilter is fed to TK9, and then from TK9 to either perchlorate ion exchange or the primary reverse osmosis unit. Sludge from the microfilter is periodically removed to TK8 for subsequent treatment in the rotary vacuum filter.

M6. Pressure Filters

Three pressure media filters, which operate in parallel or singly, can be used to remove suspended solids in water in the reaction tanks. Water is pumped from either TK71 or TK72, through the media in an enclosed steel vessel at a pressure of about 30 psig. Pressure filters are 30 inches in diameter and ~five feet high, and are constructed of carbon steel lined with plasite (an epoxy). The media in the pressure filter consists of coarse and fine sized particles of sand, garnet, coal, and gravel. Backwashing is needed periodically to remove solids and to reconstitute the bed. Each filter can process up to 50 gallons per minute.

M7. Perchlorate Ion Exchange

Ion-exchange columns located in Room 16 are used to remove perchlorates. Six of the 12 fiberglass reinforced plastic (FRP) ion exchange vessels are typically in service. Vessels range in size to nine cubic feet of ion exchange resin, and can treat up to 60 gallons of water per minute. The columns are installed downstream of TK9, and prior to treatment by the Reverse Osmosis. TK9 is a 9000-gallon, carbon-steel, above-grade vessel located in Room 61. Resins are not re-generated. Instead, columns are drained of water, then disposed as solid radioactive waste.

M8. Primary Reverse Osmosis

The Reverse Osmosis unit removes soluble contaminants, and produces a high quality effluent that approaches and sometimes meets EPA primary drinking water standards. The Reverse Osmosis unit uses commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The unit has three 8-inch-diameter pressure vessels, and operates at pressures of about 400 psig. Each pressure vessel contains four membranes in series; each membrane is 40 inches in length. The Reverse Osmosis is a two-stage membrane unit; the third pressure vessel receives reject from the first two. Feed may first be pH-adjusted at the perchlorate ion exchange feed tank, TK-9. Permeate is sent to storage tanks in Room 34B; concentrate is processed through the secondary Reverse Osmosis (SRO) unit. The primary Reverse Osmosis has a capacity up to 60 gallons per minute.

M9. RESERVED

M10. Effluent Storage

Three tanks are available for the storage of treated water. Two Frac tanks (north tank and south tank) receive permeate from the primary reverse osmosis unit. Frac tanks are horizontal carbon steel tanks located in Room 34B; each has a capacity of ~20,000 gallons. Water that receives post-Reverse Osmosis treatment (i.e., copper-zinc ion exchange) is collected in a 1000-gallon tank, TK38 in Room 38. TK38 is constructed of high-density polyethylene.

M11. Discharge of Treated Water to the Environment

11a. Discharge Via Effluent Evaporator Using Natural Gas

Treated water may be discharged to the environment via an effluent evaporator located outside Room 34 of Building 50-01. Water is heated using natural gas in a 4.5 million Btu/hr low NOx gas burner that can evaporate up to 400 gallons of water per hour. The unit is constructed of stainless steel, and has received a No Permit Required Determination from the NMED Air Quality Bureau.

11b. Discharge Via Solar Evaporation

Zero-Liquid-Discharge Solar Evaporation Tanks for solar evaporation of treated water are currently being constructed. The tanks are located on a site of approximately one acre, about two-thirds of a mile from the TA-50 RLWTF within TA-52 at LANL. The Zero Liquid Discharge Solar Evaporation Tanks have concrete walls approximately four feet high, and have a double liner with leak detection; each is approximately 70' x 250' in size, with a usable capacity of about 380,000 gallons. The pump house has the capability of returning the contents of the tanks to the TA-50 RLWTF for storage and retreatment, if necessary. Approximately 3500 feet of high-density polyethylene (HDPE) transfer piping connect the Zero Liquid Discharge Solar Evaporation Tanks and the TA-50 RLWTF.

11c. Discharge Via NPDES Outfall #051

Treated water that meets NPDES and DOE discharge standards can be discharged to the environment via NPDES Permitted Outfall #051 in Mortandad Canyon. Water is pumped to the outfall through approximately 1400 feet of three-inch-diameter, carbon steel pipe. NPDES samples are collected at TA-50 while water is discharging to the canyon.

TRANSURANIC TREATMENT PROCESS

Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant (WIPP) as a solid transuranic waste.

T1. Transuranic Collection System

The transuranic collection system runs from Building 55-04 through below-grade, double-contained transfer lines, through a valve pit at 50-201, and into influent storage tanks at Building 50-66. One transfer line is dedicated for acid waste, and a second for caustic waste. Both are two-inch-diameter pipes. The acid waste lines are constructed of polyvinylidene fluoride (PVDF); the caustic lines are constructed of polypropylene (PP).

TA55 and RLWTF personnel coordinate batch wastewater transfers in advance. Once a transfer is coordinated, a batch of known volume, typically less than 100 gallons, is discharged through the system by gravity to the TRU influent storage tanks in Building 50-66. Transuranic influent is not trucked.

T2. Transuranic Influent Storage

Two influent storage tanks are located in Building 50-66, one for acid waste (~3900 gallons) and the other for caustic waste (~3000 gallons). Each tank has enough capacity to hold more than one year of transuranic influent. Both tanks are cylindrical, cone-bottomed tanks, and each has a mixer and a HEPA-filtered vent. The sump in Building 50-66 has a leak detector that is linked to the RLWTF control room.

T3. Transuranic Treatment

Acid waste is pumped from Building 50-66 into TK1 in Room 60. The acid waste is neutralized by mixing it with liquid sodium hydroxide (nominal 25%). Other chemicals (ferric sulfate or polymer) may be added to promote particle growth. Solids that form in the neutralized waste settle, and are then pumped to the sludge tank, TK-7A. Clear liquid is pumped through a pressure filter into a receiving tank, TK3.

Caustic waste is pumped from Building 50-66 to Tank TK1 in Room 60, and then into the sludge-settling tank, TK-7A. The treated caustic waste is allowed to stand in the tank, which allows most of the solid particles to deposit on the bottom of the tank as sludge. In order to facilitate particle growth, TK-7A may be seeded with sludge left over from the previous treatment campaign. Chemicals (lime, ferric sulfate, or polymer) may also be added to TK-7A for this purpose.

T4. Transuranic Sludge

Sludge collects in TK-7A, a 900-gallon carbon-steel tank in Room 60. Excess water is decanted from TK-7A, then transferred to the effluent storage tank, TK3. The sludge itself is added to cement and sodium silicate, then tumbled and allowed to cure. After curing, drums of cemented sludge are transported to TA-54 to await shipment to and disposal at the Waste Isolation Pilot Plant as a solid transuranic waste.

T5. Transuranic Effluent

Effluent from the transuranic treatment process is collected in TK3 in Room 60, a 1000-gallon, horizontal fiberglass tank. Having been treated, effluent is no longer transuranic waste. The effluent either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms.

SECONDARY TREATMENT PROCESSES

The secondary treatment process treats wastes from the primary and transuranic treatment lines. It consists of a rotary vacuum filter to treat sludge from main process, secondary reverse osmosis to treat reverse osmosis concentrate from the main process and/or effluent from the transuranic process, and a bottoms disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

S1. Secondary Reverse Osmosis

These two Reverse Osmosis units, each with a capacity of up to five gallons per minute, recover much of the concentrate from the primary Reverse Osmosis unit, thereby reducing the volume of bottoms that must be disposed of. Effluent from the transuranic process may also be treated. Secondary Reverse Osmosis units use commercially available high-rejection membranes, typically rated at nominal NaCl rejection of 90-99%. The units have two 4-inch-diameter pressure vessels, and operate at pressures of about 200 psig. Each pressure vessel has a single membrane 40 inches in length. They are two-stage membrane units; the second pressure vessel receives reject from the first. Concentrate from the primary Reverse Osmosis unit is collected in TK73 (3700 gallons, lined steel), then fed to a smaller feed tank (300 gallons, polyethylene) in Room 24, adjacent to the secondary Reverse Osmosis (SRO) units. Permeate from the SRO is sent to the feed tank for the perchlorate ion exchange system (TK9), for re-treatment through the MTP. Reject is sent to storage tanks in Building 50-248 to await shipment as bottoms.

S2. Rotary Vacuum Filter

Solids from the microfilter (or pressure filters) are separated from water and then disposed as low-level radioactive solid waste. This sludge treatment operation includes the TK8 storage tank (capacity of 8,000 gallons) in Room 61 and the rotary vacuum filter in Room 116. Low-level sludge contains more than 90% of the radioactivity present in low-level influent; it does not contain hazardous chemical constituents above RCRA limits, and is not a mixed waste.

S3. Bottoms Storage

RLWTF bottoms are stored in tanks in Building 50-248 until shipped to a commercial waste treatment facility using a commercial tanker truck; shipments typically range from 4,000 to 5,000 gallons each. The commercial waste treatment facility processes bottoms to a solid form, and disposes of the solids as low-level radioactive waste at a Department of Energy or commercial disposal site.

Table 2: Vessel Information for RLWTF Treatment Units

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Main Treatment:						
M1 Collection System	Piping	----	Polyethylene	B	Polyethylene	
	Vaults (62)	----	Concrete	B	----	x
M2 Influent Storage	WMRM Tanks (2)	50,000	Fiberglass	B	Concrete	z
M3 Emergency Influent Storage	WMRM tanks (4)	50,000	Fiberglass	B	Concrete	z
M4 Reaction Tanks	TK71, TK72	10,000	Steel	A	Concrete-w	z
M5 Microfilter	Filter	40	Steel	A	Concrete-w	
	Sludge tank	500	Polyethylene	A	Concrete-w	
	Cleaning tanks	200	Polyethylene	A	Concrete-w	z
M6 Pressure Filters	Filters (3)	100	Lined Steel	A	Concrete-w	z
	TK71, TK72	10,000	Steel	A	Concrete-w	z
M7 Perchlorate Ion Exchange	Ion Exchange Vessels (12)	50	Fiberglass	A	Concrete-w	z
	TK09	10,000	Steel	A	Concrete-w	
M8 Primary Reverse Osmosis	RO Vessel	40	Steel	A	Concrete-w	
M9 RESERVED						
M10 Effluent Storage	N. Frac, S. Frac	20,000	Steel	A	Concrete-w	z
	TK-38	1,000	HDPE	A	Concrete-w	
M11 Effluent Evaporator	----	1,200	Stainless Steel	A	Hypalon, Asphalt	
M11 Solar Evaporation	E. Tank, W. Tank	380,000	HDPE	A	HDPE, Concrete	z
M12 NPDES Outfall #051	----	----	----	B	----	y

Notes:

v: Two concrete bottom slabs, with compacted tuff between.
w: Floor of Building 50-01, with floor drains, provides secondary containment.
x: Vaults provide secondary containment.
y: Pipe is below grade; the outfall is at the surface.
z: Capacity is for each vessel.

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Table 2: Vessel Information for RLWTF Treatment Units (Continued)

Unit Operation	Vessel	Capacity (gallons)	Material	Above (A) Below (B)	Secondary Containment	Note
Transuranic:						
T1 Collection System	Piping	----	PVDF , PP	B	PVDF, PP	
T2 Influent Storage	Acid Tank	3,900	Steel	B	Concrete	
	Caustic Tank	3,000	Steel	B	Concrete	
T3 Treatment	TK1	900	Steel	A	Concrete-w	
	TK2	800	Fiberglass	A	Concrete-w	
T4 Drum Tumbling	TK-7A	900	Steel	A	Concrete-w	
T5 Effluent Storage	TK3	1,000	Fiberglass	A	Concrete-w	
Secondary Treatment:						
S1 Secondary Reverse Osmosis	RO Vessel	10	Fiberglass	A	Concrete-w	
	TK25	300	Polyethylene	A	Concrete-w	
	TK73	3,700	Steel	A	Concrete-w	
S2 Rotary Vacuum Filter	Rotary Vacuum Filter	900	Stainless Steel	A	Concrete-w	
	TK8	8,000	Steel	A	Concrete-w	
S3 Bottoms Storage	TK-NE, SE, SW, NW	20,000	Steel	A	Concrete	z
	3K tank	3,000	Steel	A	Concrete	
	17k tank	17,000	Steel	A	Concrete	

Notes:

w: Floor of Building 50-01, with floor drains, provides secondary containment.

Z: Capacity is for each vessel.

ENCLOSURE 4

Revised Process Schematic – Appendix B

EPC-DO-16-133

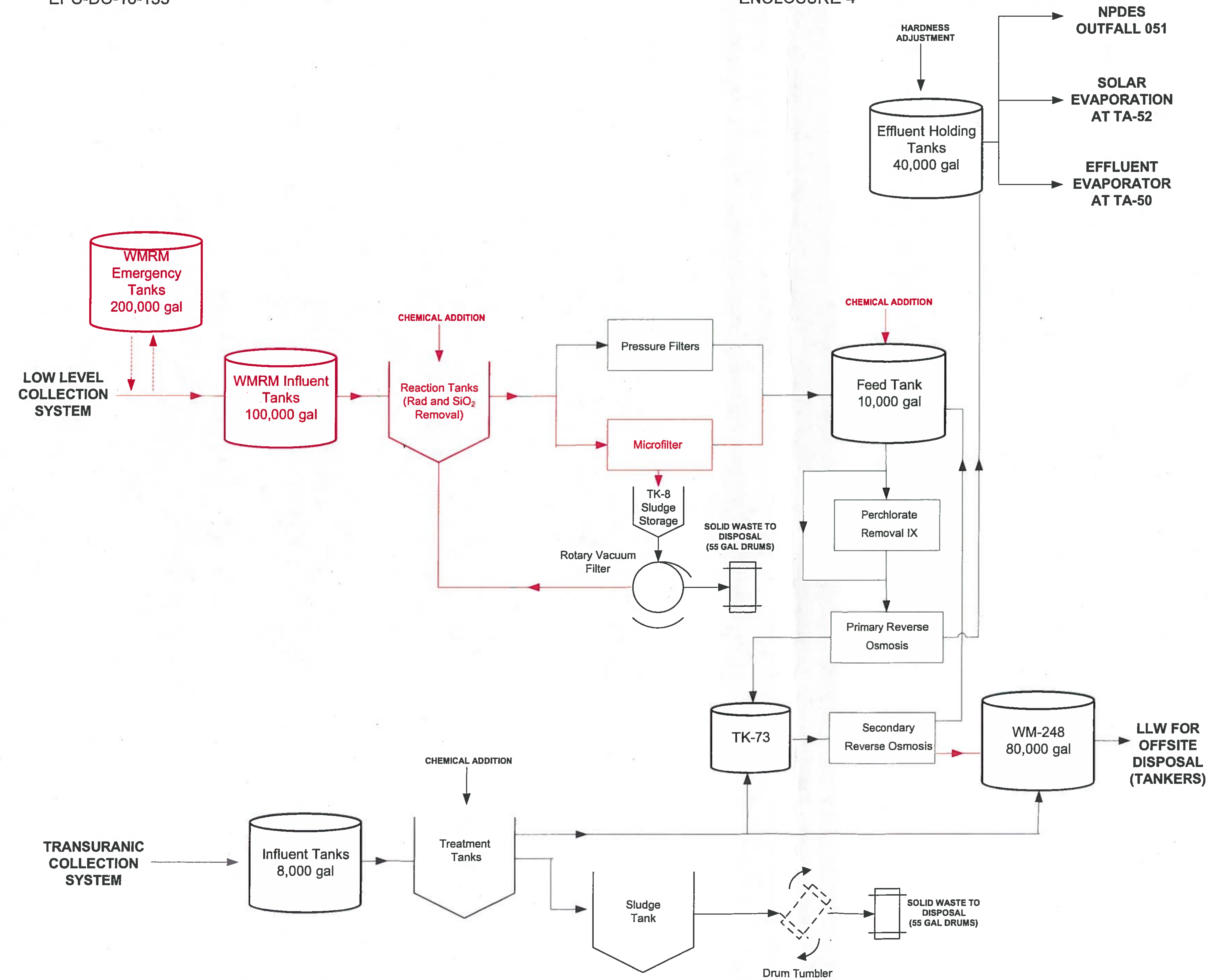
LA-UR-16-23627

Date: JUN 0 3 2016

EPC-DO-16-133

ENCLOSURE 4

LA-UR-16-23627



General Notes

NOTES:

THIS PROCESS SCHEMATIC DEPICTS TYPICAL FLOW PATHS WHEN TREATING WATER AT THE TA50 RLWTF. ACTUAL TREATMENT MAY VARY DEPENDING UPON WATER QUALITY. FOR EXAMPLE, WATER FROM THE CLARIFIER MAY BE SENT TO EITHER THE GRAVITY FILTER OR THE PRESSURE FILTERS, THUS BYPASSING A SET OF FILTERS. OR PERMEATE FROM THE SECONDARY RO UNIT MAY BE SENT TO EFFLUENT HOLDING TANKS RATHER THAN TO THE PERCHLORATE FEED TANK.

No.	Date	Class Rev	ADC	Description	DFT	CHK	CSE SME	APP
4	08/24/2015	4	U	CHANGES FOR CLOSURE PLAN	CCDN	JCDS	JCR	JCR
3	05/15/2012	3	U	CHANGES FOR BRIDGING PROJECT	JCR	JCDS	RLS	RLS
2	01/11/2012	2	U	CHANGES FROM DISCHARGE PERMIT MTNG	JCR	JCDS	RLS	RLS
1	10/31/2011	1	U	CHANGES FROM WQH – RLW MEETING	JCR	JCDS	RLS	RLS

ENGINEERING STANDARDS PROGRAM

Radioactive Liquid Waste Treatment Facility (RLWTF)

PROCESS SCHEMATIC
NPDES OUTFALL 051
POST GROUND WATER
PERMIT MODS

DRAFTER	J. Ruiznavarro
CHECKER	J.C Del Signore
CSE / SME	R. Swickley
Date	10/31/2011

SUBMITTED RLWTF EM R. Swickley

APPROVED FOR RELEASE RLWTF DAR R. Swickley

Los Alamos National Laboratory
Los Alamos, NM 87545

RLWTF-SD-PFD-001

1 OF 1

CLASSIFICATION UNCLASSIFIED

ADC

DATE 10/31/2011

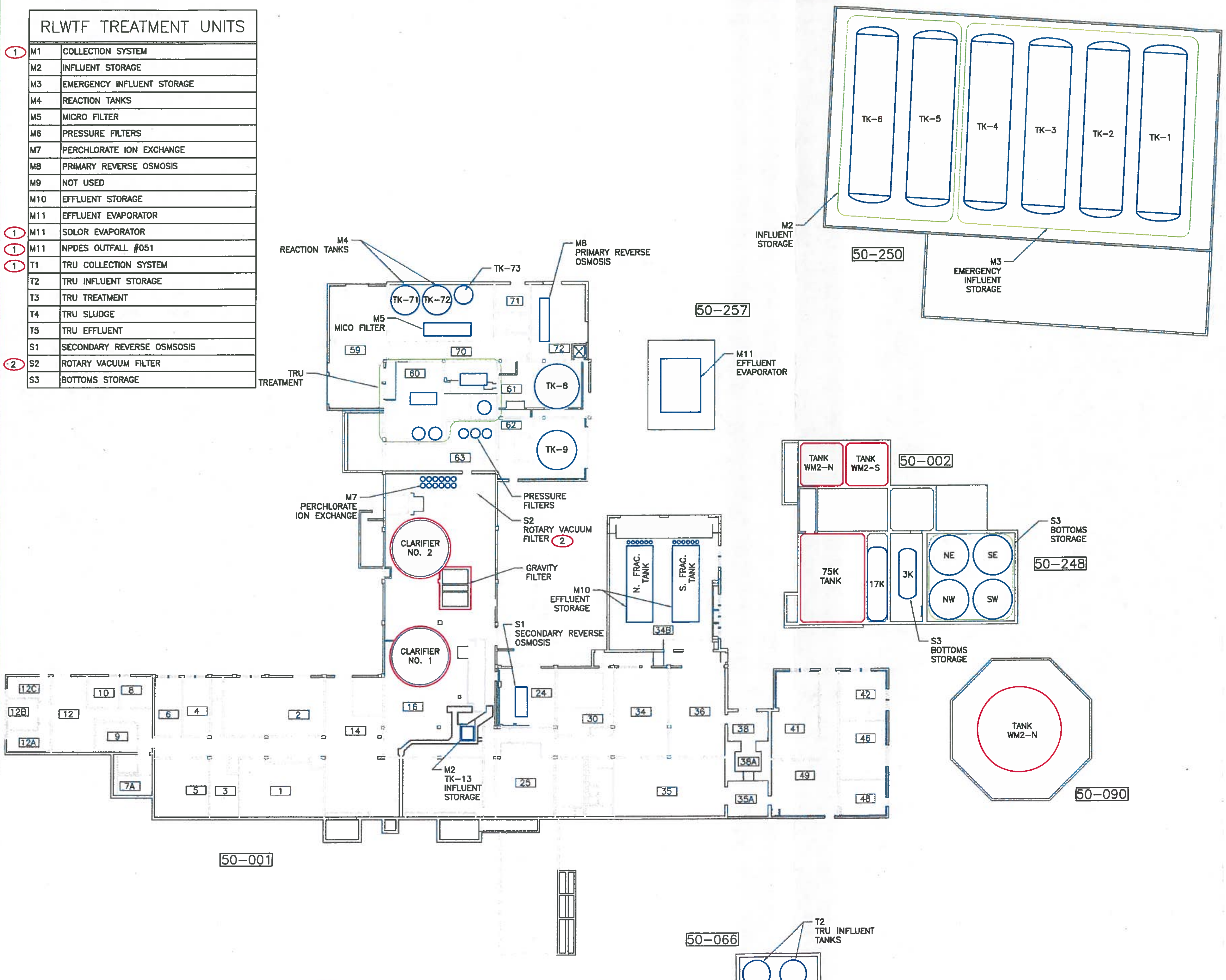
PROJECT ID N/A

REV 4

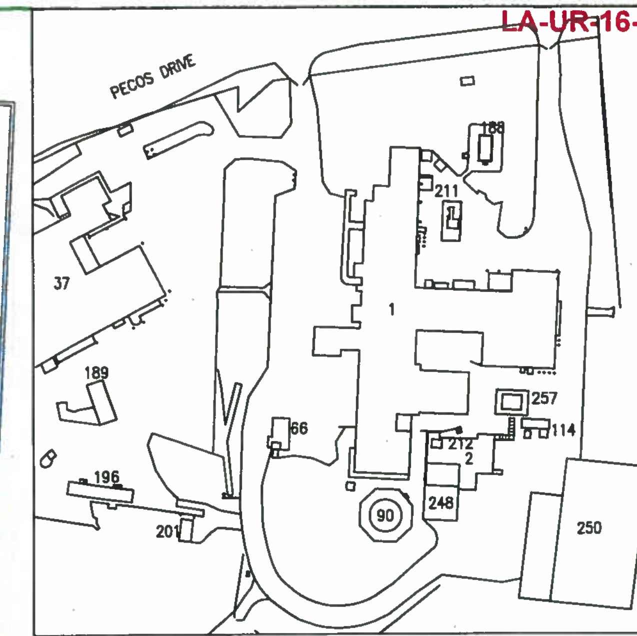
: 13353

EPC-DO-16-133 **ENCLOSURE 5** **LA-UR-16-23627**

RLWTF TREATMENT UNITS	
(1) M1	COLLECTION SYSTEM
M2	INFLUENT STORAGE
M3	EMERGENCY INFLUENT STORAGE
M4	REACTION TANKS
M5	MICRO FILTER
M6	PRESSURE FILTERS
M7	PERCHLORATE ION EXCHANGE
M8	PRIMARY REVERSE OSMOSIS
M9	NOT USED
M10	EFFLUENT STORAGE
M11	EFFLUENT EVAPORATOR
(1) M11	SOLOR EVAPORATOR
(1) M11	NPDES OUTFALL #051
(1) T1	TRU COLLECTION SYSTEM
T2	TRU INFLUENT STORAGE
T3	TRU TREATMENT
T4	TRU SLUDGE
T5	TRU EFFLUENT
S1	SECONDARY REVERSE OSMOSIS
(2) S2	ROTARY VACUUM FILTER
S3	BOTTOMS STORAGE



RLWTF TREATMENT UNIT LOCATIONS
SCALE: 1/8" = 1'-10"



LOCATION PLAN
SCALE: NONE TA-50

GENERAL NOTES

1. IF SHEET IS NOT AN 11X17, THEN IT IS A REDUCED OR ENLARGED SIZE PLOT. USE INDICATED SCALE APPROPRIATELY.
2. SCALE APPLIES TO BUILDING STRUCTURES AND RELATIVE BUILDING LOCATIONS WITHIN THE SITE. DEPICTED SIZE OF TREATMENT UNITS AND STORAGE TANKS ARE FOR REFERENCE ONLY.

KEYED NOTES

(1) TREATMENT UNIT NOT SHOWN ON SKETCH.
(2) ROTARY VACUUM FILTER LOCATED NEAR THIS AREA SOUTH-EAST CORNER RM. 116A.

ENGINEERING SERVICES

TA-50 BLDG. 1 DATE:08-31-15

Los Alamos NATIONAL LABORATORY PO Box 1663 Los Alamos, New Mexico 87545

13354

ENCLOSURE 5

Revised Scaled Floor Plan—Appendix B

EPC-DO-16-133

LA-UR-16-23627

Date: JUN 0 3 2016

:13356

Beers, Bob

From: Saladen, Michael Thomas
Sent: Wednesday, July 06, 2016 11:46 AM
To: Huddleson, Steven, NMENV; Beers, Bob; Del Signore, Chris
Cc: Huey, Greg, NMENV; Pullen, Steve, NMENV
Subject: RE: List of SWMU associated with RLWTF
Attachments: RLWTF SWMUs.pdf

Steve,

Per your request, attached is the list of SWMUs. Bob will not be back in the office until next week. Please let me know if you have questions or need additional information. Thanks!!!

Mike

From: Huddleson, Steven, NMENV [mailto:Steven.Huddleson@state.nm.us]
Sent: Friday, July 01, 2016 11:04 AM
To: Beers, Bob; Del Signore, Chris; Saladen, Michael Thomas
Cc: Huey, Greg, NMENV; Pullen, Steve, NMENV
Subject: List of SWMU associated with RLWTF

Welcome back from your respective vacations. I continue to review the closure plan and plan revisions to DP-1132. In light of the new consent order, I am trying to locate a list of SWMU's associated with the RLWTF. The new consent order table in Appendix A is not descriptive enough to determine which units at RLWTF are actually identified in the consent order. This will be helpful..

Happy July 4..

Steve Huddleson, P.G., C.P.G.
Manager, Pollution Prevention Section
Ground Water Quality Bureau
New Mexico Environment Department
(505) 827-2936

SWMUs and AOCs in Upper Mortandad Canyon Aggregate Area associated with RLWTF

- SWMU 50-001(a) – RLWTF (Building 50-1)
- AOC 50-001(b) – Active RLW waste lines connected to Building 50-1
- SWMU 50-002(a) – Concrete vault containing waste tanks (Building 50-2)
- SWMU 50-002(b) – Vaulted underground waste tank (50-67) and inlet and outlet lines
- SWMU 50-002(c) – Vaulted underground waste tank (50-68) and inlet and outlet lines
- AOC 50-002(d) – Decommissioned aboveground nitric acid tank (50-5)
- SWMU 50-004(a) – Former underground RLW waste lines connected to Building 50-1
- SWMU 50-004(b) – Decommissioned underground vault (50-3)
- SWMU 50-004(c) – Former waste lines connected to vault 50-3
- SWMU 50-006(d) – RLWTF outfall

Consent Order Status of RLWTF SWMUs and AOCs

- SWMU 50-001(a) – Investigation delayed under D&D of facility.
- AOC 50-001(b) – Investigation delayed until D&D of facility.
- SWMU 50-002(a) – Investigation delayed until D&D of facility.
- SWMU 50-002(b) – Investigation delayed until D&D of facility.
- SWMU 50-002(c) – Investigation delayed until D&D of facility.
- AOC 50-002(d) – Investigation delayed until tank is removed.
- SWMU 50-004(a) – Supplemental investigation report for Upper Mortandad Canyon Aggregate Area.
- SWMU 50-004(b) – Supplemental investigation report for Upper Mortandad Canyon Aggregate Area.
- SWMU 50-004(c) – Supplemental investigation report for Upper Mortandad Canyon Aggregate Area.
- SWMU 50-006(d) – Supplemental investigation report for Upper Mortandad Canyon Aggregate Area.

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NATIONAL LABORATORY
EST. 1943

RECEIVED

JUL 19 2016

NM Environment Department
Office of the Secretary

Environmental Protection & Compliance Division
Environmental Compliance Programs (EPC-CP)
PO Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666

National Nuclear Security Administration
Los Alamos Field Office, A316
3747 West Jemez Road
Los Alamos, New Mexico, 87544
(505) 606-0397/Fax (505) 284-7522

Date: July 19, 2016
Symbol: EPC-DO-16-208
LA-UR: 16-21315
Locates Action No.: N/A

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Revised Closure Plan for Draft Discharge Permit DP-1132

On December 23, 2015, the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) submitted a Closure Plan (ENV-DO-15-0356) to the New Mexico Environment Department (NMED) to satisfy Condition No. 42 of Draft Discharge Permit DP-1132. At a subsequent meeting between NMED and DOE/LANS on January 28, 2016, NMED Ground Water Quality Bureau staff requested that DOE/LANS modify the above-referenced Closure Plan. A revised Closure Plan was submitted to NMED on March 24, 2016 (EPC-DO-16-062). Due to the recently issued Compliance Order on Consent (Consent Order, June 2016) by the NMED to the U.S. Department of Energy it is necessary for DOE/LANS to revise the Closure Plan once again. Enclosure 1 provides a revised Closure Plan with updated references.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding the revised Closure Plan.

Sincerely,

John P. McCann
Acting Division Leader
Environmental Protection & Compliance Division
Los Alamos National Security, LLC

Sincerely,

Peter Maggiore for

Jody M. Pugh
Assistant Manager
National Security Missions
NNSA/Los Alamos Field Office

JPM:JMP:RSB/lm

Enclosures: (1) Revised Closure Plan for draft Discharge Permit DP-1132, July 2016

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ENCLOSURE 1

Revised Closure Plan for draft Discharge Permit DP-1132,
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Radioactive Liquid Waste Treatment Facility

Closure Plan

DP-1132

July 2016

Los Alamos
NATIONAL LABORATORY
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DOE	U.S. Department of Energy
DOP	Detailed Operating Procedures
DOT	U.S. Department of Transportation
EDR	electrodialysis reversal
EPA	U.S. Environmental Protection Agency
IWD	Integrated Work Document
IX	ion exchange
LANL	Los Alamos National Laboratory
LDR	Land Disposal Restrictions
LLRLW	low-level radioactive liquid waste
LLRW	low-level radioactive waste
LLW	low-level waste
NE	northeast
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
NW	northwest
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RLWCS	Radioactive Liquid Waste Collection System
RLWTF	Radioactive Liquid Waste Treatment Facility
RO	reverse osmosis
RWP	Radiation Work Permit
SCADA	supervisory control and data acquisition
SE	southeast
SET	solar evaporator treatment
SW	southwest
TA	Technical Area
TRU	transuranic
WAC	waste acceptance criteria
WIPP	Waste Isolation Pilot Plant

1. Introduction

This Closure Plan describes the future activities to close the Low-Level Radioactive Liquid Waste Treatment Facility (RLWTF) at Technical Area (TA)-50 at Los Alamos National Laboratory (LANL). The Plan describes actions necessary to close the existing RLWTF, and controls that will be implemented during and following closure activities to comply with the provisions specified in Conditions 42 and 43 in the Draft Discharge Permit DP-1132, issued by New Mexico Environment Department (NMED) (2015).

Closure activities include the removal of treatment units, support systems, and structures comprising the existing RLWTF, thereby removing potential sources of releases of contaminants to soil and groundwater. Following completion of closure activities, the footprint area occupied by the current RLWTF will be backfilled to conform to surrounding grades, and revegetated. Following completion of closure activities, a Closure Report will be submitted to the NMED for review and approval.

A consolidated closure schedule is discussed in Section 5 and presented in Figure 4; it presents simultaneous closure of all RLWTF units, systems, and facilities. History and current planning, however, both point to another possibility, that major facility components may be replaced at different times. Such changes will be accompanied by amendment of this Plan, as required by Condition 42 of DP-1132.

2. Overview of RLWTF

The RLWTF is located at Technical Area 50 along Pecos Drive within LANL boundaries. The facility was designed, constructed, and commissioned to replace a treatment facility that had been located in the Los Alamos townsite, near the current intersection of Canyon Road and Central Avenue. The RLWTF has been in operation since 1963.

2.1 Treatment Processes and Facilities

An aerial view of the RLWTF structures at TA50 is presented in Figure 1.The location and generalized layout of buildings and structures, and RLWTF treatment units comprising the RLWTF are depicted on Figure 2. Information in these two figures in discussed in the following two sections..

2.1.1 Treatment Processes

From a *process* perspective, the RLWTF has two treatment systems, one for low-level radioactive wastewater, and a separate treatment system for transuranic (TRU) radioactive wastewater. The volume of transuranic RLW is small, typically one percent or less of the volume of low-level RLW. Both processes use equipment commonly found in wastewater treatment facilities.

- The main treatment process for low-level radioactive wastes consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. Process steps include treatment with chemicals in a reaction tank, filtration, ion exchange, and reverse osmosis. Discharge to the environment is via NPDES outfall, solar evaporation, or mechanical evaporation using natural gas. Two secondary streams are generated by the main treatment process, solids from the microfilter and reverse osmosis concentrate; they are sent to the secondary treatment process.

  The secondary treatment process for low-level radioactive wastes treats wastes from the main treatment process for low-level RLW, and treated wastewater from the transuranic treatment process. It consists of a rotary vacuum filter to treat solids from the microfilter, secondary reverse osmosis to treat RO concentrate from the main process and/or effluent from the transuranic process, and a bottoms storage and disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

- The transuranic RLW treatment process consists of influent collection and storage, treatment of the transuranic RLW, and the cementation of solids removed during treatment. Treated water, no longer transuranic, is not discharged to the environment. Rather, it is sent to the secondary treatment process for low-level RLW for additional treatment, or for disposition as bottoms. Solids from the transuranic treatment process are concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant (WIPP) as a solid transuranic waste.

2.1.2 Treatment Facilities

From a *facility* perspective, the RLWTF can be viewed as having five major components:

- RLWCS (low-level RLW): The low-level radioactive liquid waste collection system is an underground double-walled pipeline system that connects the TA50 RLWTF to generator buildings in six Technical Areas. The collection system has approximately four miles of underground piping and 62 valve stations (referred to as vaults). Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room.

- WMRM (low-level RLW): The Waste Management and Risk Mitigation Facility is located about 50 meters southeast of Building 50-01. WMRM houses six tanks, with a capacity of 50,000 gallons each, for the storage of low-level RLW influent. Four of these tanks will be held in reserve for use in emergency situations; two will be used for day-to-day influent collection and storage. Tanks are located in the basement of WMRM; the basement provides secondary containment.

- Building 50-001 and nearby support facilities (low-level RLW): These buildings house the primary and secondary processes for the treatment of low-level radioactive wastes, facility support functions such as HVAC and compressed air, chemical laboratories, and personnel offices. Included are:
  - Building TA50-001, low-level treatment, facility support, laboratories, offices
  - Building TA50-002, influent storage for low-level RLW;
  - Structure TA50-090, influent storage for low-level RLW;
  - Building TA50-248, storage for secondary low-level RLW; and
  - Structure TA50-257, natural gas-fired mechanical evaporator.

- Facilities that house the transuranic treatment processes, including
  - the transuranic RLW collection system, an underground pipe system that conveys transuranic RLW from TA55 to TA50;
  - Structure TA50-066 (also: WM66), influent storage for transuranic RLW;
  - Rooms 60 and 60A in Building TA50-001, for treatment of transuranic RLW

- SET (low-level RLW): The Solar Evaporation Tanks, or SET, which will be used to evaporate treated low-level radioactive liquid wastes. Two tanks are located on this approximately one-acre site within Technical Area 52 of LANL. Evaporation tanks have concrete walls approximately four feet high, and have a double liner with leak detection. Each tank is approximately 70' x 250' in size. Approximately 3500 feet of high-density polyethylene transfer piping connect the SET and the TA50 RLWTF.

2.2 Existing Low-Level RLW Treatment

2.2.1 Low-Level RLW Collection System

The RLWCS at LANL consists of approximately four miles of underground, double-walled piping. Primary piping consists of 6- or 8-inch-diameter polyethylene encased within 10- or 12-inch-diameter polyethylene secondary piping. Where the RLWCS piping passes under underground utilities, a minimum clearance (typically 24 inches) is maintained between RLWCS piping and other underground utilities. Where RLWCS piping passes under roadways, piping is installed inside a concrete pipe trench or encased in concrete at sufficient depth to protect the piping from damage from surface vehicle loads.

There are 62 underground valve stations (access vaults) along the four miles of piping. In each vault, primary piping transitions to stainless steel upon entering the vault, then transitions back to polyethylene piping when leaving the vault. Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room. Figure 3 depicts a typical low-level RLW collection system pipe trench and valve station.

2.2.2 Low-Level RLW Influent Storage

Influent low-level RLW streams currently flow from vault WM-72 through an underground, double-walled pipe, into influent storage tanks in Structure 50-002, an underground concrete structure. Four water storage tanks and a pumping station are associated with this structure. Two of the tanks, one with a capacity of 75,000 gal (75K Tank) and the other with a capacity of 17,000 gallons (17K Tank), are used to hold untreated low-level RLW influent streams. Influent is fed from these tanks to the low-level treatment process in Building 50-001 via another underground, double-walled pipe.

This storage arrangement will change when Groundwater Permit DP-1132 is issued. When the permit is issued, low-level influent will be directed from vault WM-72 through an underground, double-walled pipe, into influent storage tanks in Structure TA50-250, the WMRM Facility. The WMRM Facility houses two 50,000-gallon storage tanks to accommodate daily use for receipt and storage of influent that will be processed at RLWTF, and houses four additional 50,000-gallon tanks to provide off-normal influent storage capability in the event of off-normal conditions, including unavailability of the RLWTF.

2.2.3 Low-Level RLW Treatment Processes

The main treatment process includes treatment with chemicals in a reaction tank, filtration, ion exchange, and reverse osmosis (RO). Main treatment occurs primarily in Rooms 16, 70, and 72 of Building TA50-001. Table 2 provides a summary of the principal structures, individual RLW treatment units, and associated components.

Two secondary streams are generated by the main treatment process: filtration solids and RO concentrate. Both of these are piped to the secondary treatment process for additional treatment. Low-level solids are sent to a rotary vacuum filter in Room 116; RO concentrate is piped to a secondary reverse osmosis unit in Room 24. Both of units generate a liquid waste stream clean enough to be re-treated in the low-level main treatment process, and a waste stream that must be disposed as low-level radioactive solid waste.

2.2.4 Discharge of Treated Low-Level RLW

Treated water from primary reverse osmosis is routed to one of the two 20,000-gallon effluent holding tanks (North and South Frac tanks) in Room 34B of Building 50-001. The two frac tanks are horizontal carbon steel tanks. At the present time, treated liquid waste from the frac tanks is conveyed to an mechanical evaporator in Structure 50-257 where the liquid is evaporated using natural gas.

As an alternative to evaporation, treated water that meets regulatory discharge standards (NPDES, DOE, and NMED) can be discharged to the environment through permitted Outfall 051 in Mortandad Canyon. Treated water is pumped to the outfall through approximately 1,400 feet of three-inch-diameter, carbon steel pipe.

A third discharge alternative has been constructed. Treated low-level RLW will be able to be pumped from the Frac tanks to the Solar Evaporator Tanks at TA52. The SET system consists of two open, lined tanks located on a site of approximately 1 acre, about two-thirds of a mile from the TA-50 RLWTF within TA-52 of LANL. As with the WMRM Facility, the solar evaporation tanks are not currently in use.

Table 3 provides information on the historic waste streams handled in each of the LL RLW treatment units and the low-level RLW collection system.

2.3 Existing Transuranic RLW Treatment

2.3.1 Transuranic RLW Collection System

The Transuranic Radioactive Liquid Waste Collection System (TRU RLWCS) is comprised of three underground, double-walled transfer piping systems: one for conveying acid waste, one for caustic waste, and one spare pipe. Each pipe is approximately 1600 feet in length.

Underground piping is double-wall construction with the interior pipe sizes ranging from 1½ inches to 2 inches. Pipe materials consist of either stainless steel (for the acid waste stream) or thermoplastic material. The piping is encased where it passes below Pecos Drive and is positioned at sufficient depth to protect it from damage by surface vehicle loads. The outer pipe of each line is connected to a drip tray located inside the WM-201 vault such that a leak of the inner pipe drains to a sump inside the WM-201 vault.

The valve station structure located in vault WM-201 (structure TA-50-201) is used to isolate the downstream TRU Influent Storage System from the upstream discharge sources at TA-55. Piping inside the WM-201 vault is single-wall construction. Should there be a leak inside the WM-201 vault, it also drains into the sump in the vault. The WM-201 vault is approximately 1.5 meters (5 feet) below grade and serves as secondary confinement.

2.3.2 Transuranic RLW Influent Storage

The TRU Influent Storage System consists of an acid influent storage tank, caustic influent storage tank, and corresponding transfer/recirculation pumps and piping located in vault WM-66 (Structure TA50-66). Piping components include double-walled transfer pipes, one for acid waste streams and one for caustic waste streams, which are used to transfer transuranic RLW influent streams from vault WM66 to Tank TK1 in Building TA50-01, Room 60/60A, for treatment. Both the acid and caustic influent storage tanks are cylindrical in shape and have conical-shaped bottoms.

The initial TRU RLW influent storage tanks and conveyance piping systems to the TRU processing units in Building 50-001were installed in 1979. The caustic influent tank was replaced in 1983 and again in 2007; the acid influent tank was replaced in 1995.

2.3.3 Transuranic RLW Treatment Process

The TRU RLW treatment process consists of 13 individual vessels having a combined total capacity of approximately 14,200 gallons. Table 4 provides a summary of the individual TRU RLW treatment units contained in the existing RLWTF.

Acid wastes are neutralized using sodium hydroxide; caustic wastes are treated with lime to adjust alkalinity. Both of these treatment steps produce transuranic solids. Treated transuranic RLW is pumped from Room 60 to the low-level secondary treatment plant for additional processing (e.g., to secondary reverse osmosis). TRU solids are solidified in 55-gallon drums using cement. After curing, drums are stored to await shipment to and disposal at the Waste Isolation Pilot Plant (WIPP) as a solid TRU waste form (cement monolith).

Table 5 provides information on the historic waste streams handled in each of TRU RLW treatment unit and TRU RLW collection system.

2.4 Chemicals Used in RLWTF Treatment Processes

Various chemicals are used at the RLWTF:

- Bulk process chemicals used for the treatment of RLW;
- Laboratory chemicals used for analysis-related activities; and
- Ancillary chemicals used for maintenance and general facility operations.

Bulk chemicals include gases (e.g., argon and P-10, a methane-argon mixture), liquids, and powders/solids (e.g., perlite, magnesium sulfate heptahydrate [Epsom salt], and cement used for the solidification of TRU solids). Liquid chemicals include sodium hydroxide for neutralization, sodium permanganate for influent oxidation, sodium silicate as cement wetting agent, and sulfuric acid for pH adjustment.

Most of the chemicals used at the RLWTF are found in the low-level treatment areas and processes. Depending on the type and form of chemical, bulk chemicals are stored in tanks, refrigerated tanks (argon), 55-gallon drums, bags (50-lb or 100-lb bulk),and cylinders (gases).

In addition to bulk chemicals, small quantities of chemicals, typically contained in one-gallon or smaller containers, are used in the analytical chemistry laboratories that support the RLW treatment process. These chemicals are handled and used in accordance with consensus industry standards.

2.5 History of RLWTF Operations

Construction of the current Radioactive Liquid Waste Treatment facility, at Technical Area 50, started in July 1961. It was a replacement for a treatment facility that had been located in the Los Alamos townsite, near the current intersection of Canyon Road and Central Avenue.

The original TA50 facility had just two buildings, 50-01 and 50-02. The process, with a capacity of 250 gallons per minute, consisted of influent storage, chemical precipitation, filtration, and effluent storage. The facility also included laboratories for chemical and radioactive analysis of water samples, facility support functions, and offices. Treatment started in June 1963. In 1964, the first full year of operations, the facility treated 13.6 million gallons of radioactive liquid wastes. (For comparison, the RLWTF treated 0.8 million gallon in 2014.)

In the 53 RLW years since treatment began, a number of facility additions and process modifications and improvements have occurred. Table 1 presents a synopsis of major RLWTF activities, facility and process additions, and modifications and improvements. Some of these are discussed in the following paragraphs.

- NPDES compliance (1978): The U.S. Environmental Protection Agency was created in 1970, and surface water regulations soon followed. LANL received its first NPDES Permit in 1974 from the Army Corps of Engineers; the permit included only sanitary outfalls. LANL received its second NPDES Permit four years later from the EPA; this permit created effluent limits for all LANL outfalls, including Outfall 051 from the RLWTF.
- Treatment of transuranic RLW (1979): Processing formerly performed at TA21 was relocated to TA55 beginning in 1977. In order to treat transuranic wastes from the new facility, underground transfer lines were installed between TA55 and the RLWTF, influent tanks were constructed (WM66), and treatment equipment was installed in Room 60. First Room 60 treatment of transuranic wastes occurred in July 1979.
- New collection system (1983): The original collection system for low-level radioactive liquid waste was constructed under specifications for sanitary waste systems. Pipes were vitrified clay pipe with asphalted joints and, for road crossings, cast iron pipe. This original system was replaced by the current collection system in 1983. The current system is double-walled, pipeline within a pipeline. Primary piping is six- or eight-inch-diameter polyethylene encased within 10- or 12-inch polyethylene secondary piping. The primary piping transitions to stainless steel in each of the underground valve stations (also referred to as vaults), then transitions back to polyethylene. Vaults are equipped with leak detection sensors that are linked electronically to the RLWTF control room. The majority of the original collection system piping was decommissioned and removed in 1975; excavated soils were characterized for radioactive constituents and remediated.
- Sanitary waste treatment: A septic system was installed at TA50 in 1964 at the south end of the RLWTF. The septic system consisted of a line from Building 50-01 that discharged to a manhole (structure 50-09) and then to a septic tank (structure 50-10). The effluent line from the tank tied to a distribution box (structure 50-11), which discharged to four parallel perforated pipes traversing a leach field. This septic system was removed in 1983 after the RLWTF had been connected to the sewage treatment facility constructed at TA46.
- Membrane treatment processes (1999): The two-step treatment process (chemical precipitation followed by filtration) was unable to meet new, reduced DOE limits for radioactivity in treated water. In order to achieve compliance, major process modifications

were installed beginning in1996 in treatment rooms at the east end of the RLWTF. Post-filtration treatment units that employed membrane separation technology were installed in these rooms. The additional treatment steps, ultrafiltration to remove smaller particles and reverse osmosis to remove much of the dissolved radioactivity, were placed into service in 1999.

- Improved and emergency influent storage (2010): Building 50-250, the Waste Management and Risk Mitigation (WMRM) facility, is located about 50 meters southeast of Building 50-01. WMRM houses six influent storage tanks with a capacity of 50,000 gallons each. It is planned that two of these will be used as influent tanks, and that four will be held in reserve for use in emergency situations. The two daily-use influent tanks will replace existing in-ground tanks that have been in service since 1963.
- Solar Evaporation (2012): Open tanks for solar evaporation of treated low-level RLW have been constructed on a site about two-thirds of a mile from the TA50 RLWTF within Technical Area 52 of LANL. The SET has two identical evaporation tanks and a pump house. Each tank has concrete walls approximately four feet high, and a double liner with leak detection. Each is approximately 70' x 250' in size. Approximately 3500 feet of high-density polyethylene (HDPE) transfer piping connect the SET and the TA50 RLWTF.

Continued use of the existing RLWTF for the collection, storage, and treatment of RLW is expected until replacement facilities are available. A new treatment facility for low-level RLW is currently under construction to the immediate west of the existing RLWTF. And new facility is being designed for the treatment of transuranic RLW, to replace the current Room 60 operations. The new transuranic facility will be located about 50 feet from the southeast edge of the existing RLWTF.

3. Closure Objectives and Approach

3.1 Closure Considerations

A number of factors are taken into consideration in developing an approach to closure of the RLWTF. These are discussed in the sections below. An overall approach is then presented in Section 3.2.

NMED Consent Order of 2016: In accordance with Condition 46 of the draft Groundwater Permit, closure of the RLWTF shall be conducted solely under the NMED Consent Order of June 2016 (Ref. NMED 2016) and not under the Groundwater Permit. No activities required under the Groundwater Permit shall conflict with or duplicate activities required for solid waste management units (SWMUs) and areas of concern (AOCs) identified under the Consent Order. Through the Consent Order, the NMED establishes priorities for characterization, cleanup, and closure of SWMUs and AOCs across LANL. Closure of the RLWTF will, therefore, be partly or largely dependent upon the Consent Order process used to establish cleanup priorities.

Equipment Stabilization: Condition 43 of the Groundwater Permit will require stabilization of treatment units or systems for which operation has ceased. Stabilization will include emptying the units of solids and liquids, and isolation so new wastes cannot be introduced to the units. The unit may not be physically decommissioned or removed, but it will pose no threat to the environment or groundwater.

Incremental Closure of Facility Components: The consolidated closure schedule discussed in Section 5 and presented in Figure 4 presents simultaneous closure of all RLWTF units, systems, and facilities. In actuality, major facility components may begin operations at different times, and major facility components will likely be replaced at different times. Many factors can contribute to this possible or likely scenario, such as differing construction and startup times, Consent Order prioritization, Federal funding, and a continuing national mission that may outlive some facilities.

As an historical example, the original low-level collection system was installed in 1963, was replaced after approximately 20 years of service, and was subsequently decommissioned. Meanwhile, other parts of the original RLWTF, also put into service in 1963, have continued in use.

Similarly, current plans call for replacement of the treatment processes in the original Buildings 50-001 and 50-002 over the next decade, while the two collection systems (low-level and transuranic) will continue to be used. In the same time horizon, new major facility components, WMRM and the TA52 SET, are planned to begin operations.

3.2 Closure Approach

Consideration and inclusion of the above-listed factors points to an overall closure sequence with the following steps:

- Operation ends for treatment unit(s) or system(s).
- In accordance with the Groundwater Permit, stabilization preparations and activities commence within 120 days of cessation: submittal of a Stabilization Plan, NMED approval, stabilization, submittal of a stabilization report, and NMED approval of the report. The end result of these actions: The unit or system poses no threat to the environment or groundwater.
- The unit(s) or system(s) get added to the list of SWMUs for the RLWTF (if not already included). Closure is then planned, scheduled, and executed pursuant to requirements and processes of the NMED Consent Order of June 2016.
- If a replacement facility component is put into operation (e.g., the new low-level treatment facility), then this Closure Plan will be revised to include the replacement facility, then submitted to the Ground Water Bureau for approval.

Section 5.9 and Figure 4 of this Closure Plan discusses an integrated closure of the RLWTF facility, with all major facility components undergoing closure at the same. (i.e., The RLWTF mission has ended, and radioactive liquid waste treatment is no longer required.) However, the factors identified in Section 3.1 will dictate when closure priorities are assigned, and when closure is initiated.

Condition 43 of DP-1132 will be used to address such uncertainties. Condition 43 provides for amendment of the Closure Plan when changes occur.

3.3 Closure Reports

Closure status reports and final reports will be prepared in accordance with requirements of the NMED Consent Order of June 2016. Reports will be submitted to the NMED Hazardous Waste Bureau and the NMED Ground Water Bureau.

3.4 Closure Completion Standard

Closure of the RLWTF will be deemed complete when RLWTF treatment units and systems, facility units and systems, and aboveground and underground structures associated with the current RLWTF have been removed, and the site regraded and restored for unrestricted use.

3.5 Replacement Low-level Facility

As this Closure Plan is written, construction has begun of a new facility, Building TA50-230, for the treatment of low-level RLW. Construction will be followed by startup testing and commissioning of both facility equipment (e.g., ventilation and air compressors) and treatment equipment. Once the new facility has been commissioned and approved for use by the NMED, low-level RLW influent will be pumped to Building TA50-230 instead of to Building TA50-01 (assuming LANL has received permission to use WMRM). The new facility will then treat low-level influent for a probationary period of approximately one year, to allow increased confidence in the ability of the new facility to perform. During the probationary period, treatment equipment in Building TA50-01 will be maintained in a state or readiness should unanticipated problems be encountered at the new low-level facility. Stabilization of the low-level treatment equipment in Building 50-01 can begin after the replacement treatment facility has proven itself (i.e., after the probationary period).

After low-level treatment has relocated to the new building, Building 50-01 will continue to house transuranic RLW operations. Transuranic treatment will require the use of all Building 50-01 facility systems (ventilation, compressed air, industrial water, change rooms, etc.), the use of chemistry labs, the use of transuranic storage and treatment units, and the use of some low-level treatment units (e.g., secondary reverse osmosis). Personnel offices in Building 50-01 will also continue to be needed and used.

4. Closure of Individual Units and Systems

4.1 Closure Procedure for LL RLW and TRU RLW Collection and Treatment/Storage Units and Systems

The following sections describe the general procedures to be followed during closure of individual units, systems and structures present at the RLWTF. Table 6 provides a listing of the individual LL RLW treatment units and systems to be closed, along with a summary of the closure activities to be undertaken to close and remove each unit. Table 7 provides details pertaining to the treatment/storage capacity and construction of the individual treatment units in the RLWTF facility. Table 8 provides a listing of all the individual TRU RLW treatment units and systems to be closed, along with a summary of the closure activities applicable to each. Table 9 lists the remaining balance of plant features (process systems and utilities) that will be closed and removed.

4.1.1 Removal of Containerized Chemicals/Waste Materials

Containers holding process chemicals or miscellaneous waste materials (e.g., liquid or solid wastes) will be removed; tanks holding process chemicals will be emptied. Depending upon their size, containers will be removed with a forklift, container dollies, air pallets, or manually. Containers will be placed on flatbed trucks, trailers, or other appropriate vehicles for transport from each structure/room. Approved containers holding radioactive waste will be moved to a permitted on-site storage unit or transported to a permitted off-site treatment, storage, or disposal facility. Appropriate shipping documentation will be prepared to accompany the waste containers during their transport and off-site disposal.

4.1.2 Structural Assessments

A structural assessment will be conducted to observe and document the starting physical conditions of the rooms or structures housing closed units. The assessment will include inspecting floors, walls and ceilings, and entrance/exit aprons or ramps for portions of above-ground structures. Photographs will be taken and archived to document existing conditions. The perimeter and the floor of each room will be examined for cracks or conditions that indicate a potential for, or evidence of an actual, prior release of constituents. The characterization program (e.g., radionuclide and chemical screening or sampling and analysis) may be modified as appropriate to reflect the results of the structural/visual assessment.

4.1.3 Preparatory Work

Each unit/system will be isolated and/or de-energized as appropriate prior to removal. Valves will be closed and, if not permanently sealed, a lock out/tag out system will be used as appropriate. Initial survey and sampling activities and radiological screening may be conducted to guide decontamination and closure activities and to identify potential waste dispositioning options.

4.1.4 Removal of Solids and Liquids from Individual Units

Removal of solids and liquids from individual LL RLW and TRU RLW treatment units will be accomplished following the applicable LANL Detailed Operating Procedures (DOP) in effect at the time of final closure. An overview of the removal activities that will be undertaken, in the context of current LANL procedures, is summarized below.

- Liquids will be removed from the tanks or vessels either: (1) in accordance with the current unit DOPs or (2) using a portable pump and hoses to evacuate the liquids into a portable collection tank. Removed liquids will be routed to the replacement RLWTF for treatment;
- Solids, if present, will be removed from the tank or vessel either: (1) in accordance with current unit DOPs or (2) using one or more appropriate methods to evacuate the solid materials into a portable collection tank. Removed solids will be routed to the appropriate solids treatment/process unit(s) in the replacement RLWTF for processing and/or packaged, labeled, and manifested for subsequent transport offsite for disposal;

Liquid and solid removal activities will be performed by personnel wearing personal protective equipment (PPE). Radiological data for the associated treatment units, piping, and other equipment will be used to select the appropriate PPE. A LANL Radiation Work Permit (RWP), if required, and a LANL Integrated Work Document (IWD) will be developed and used in combination with the applicable LANL DOP to guide these activities.

The actions required, and estimated durations, for completing removal of the various LL RLW and TRU RLW treatment units (including evacuation of liquids and solids from the individual treatment units) are presented in Table 6 and Table 8. Further details regarding the schedule for completing final closure of individual RLWTF treatment units, and the RLWTF as a whole, are provided in Section 5 below.

4.1.5 Decontamination

Equipment that may be used to decontaminate tanks and vessels, may include, but not be limited to:

- Remote insertable, rotatable mechanism, positioning/mast tool delivery arm, possibly including a high-pressure hose/nozzle system;
- Portable high-pressure washer;
- Sluicer unit, folding arm, sluicing end effectors, sluicer nozzle, and submersible pumps;
- Video cameras to monitor the effectiveness of washing;
- "Baker" tank(s);
- Concrete scabbling devices;
- Sponge media blasting equipment and blasting materials; and
- Radio decontamination solutions.

For emptying solids and washing one or more larger size tanks (e.g., TK-8, TK-9, or a bottoms storage tank in Building 50-248), a remote mechanism containing a rotating, high-pressure water jet/nozzle system, a mast tool delivery system/arm, or other similar system may be deployed either through the top of the tank or through an access hole cut into the side of the tank. In such a case, a high-pressure hose, sluicer, and/or one or more submersible recirculation pumps may be used to complete removal of solid materials from the tank bottom and adjacent floor/wall joint areas. Sluicer and pump systems employed in this fashion may use submersible pumps to supply excess, dilute tank liquids to wash the internal tank surfaces. This method recycles the tank liquid and avoids adding to the waste volume. Under such a tank decontamination scenario, the tank liquid level during most of the washing activities may be kept at a nominal minimal level (e.g., minimum depth of between approximately 30 cm (12 inches) to 61 cm (24 inches) to ensure uninterrupted sluicing/washing operations.

Specific decontamination activities will be performed by personnel wearing appropriate PPE. Radiological data for the associated treatment units, piping, and other equipment will be used to select appropriate PPE. A LANL RWP, if required, and an IWD will be developed and used in combination with the applicable LANL DOP to guide these activities.

Table 6 and Table 8 summarize decontamination methods and procedures that may be used for decontaminating individual LL RLW and TRU RLW treatment units.

4.1.6 Radiological Surveys

Radiological surveying and sampling to support closure will be done in accordance with existing LANL facility radiation survey plans and procedures. Radiological Control Technicians will perform routine radiation surveys for release of personnel and equipment and general radiological oversight for closure activities. Additional radiological surveys (direct radiological surveying and dose measurements, and smear samples) will be performed following decontamination efforts, to evaluate the effectiveness of decontamination. The results of radiation surveys will be used to support the waste management practices. If practical, radiological release surveys may be conducted on items that may be made available for reuse. Any items or system that cannot be released for reuse will be packaged, labeled, properly manifested, and transported offsite for disposal at an appropriate facility.

4.1.7 Fixative or Paint

Following decontamination of a tank or a vessel, a radionuclide fixative or suitable (e.g., epoxy) paint may be applied to the interior walls and floor of those treatment units/vessels that: (1) were used to store influent; or (2) were used for main (primary) treatment of TRU RLW streams. Application of the fixative is intended to prevent or minimize potential airborne release of radionuclides during activities such as demolition/size-reduction required to assist in minimizing potential exposure to workers, the public, and the environment.

The condition of the fixatives applied to CL-1, CL-2, and the Gravity Filter during the prior stabilization activities (LANL 2015) will be visually inspected. If the fixative in those vessels is determined to have significantly deteriorated, additional fixative may be applied prior to removing the clarifiers and Gravity Filter during closure.

4.1.8 Removal of Conveyance Piping

Piping associated with the RLWTF units and interconnected piping extending between the units comprising the RLWTF facility will be removed, decontaminated if practical and appropriate, and disposed of offsite. Influent conveyance or discharge piping connected to each unit will be removed as part of closure of each unit; some sections of pipe between existing pipe joints may be removed in conjunction with removal of individual treatment vessels/units or may be removed if necessary by making a cut in the piping. In the latter case, valves in the pipe system encompassing the pipe section to be cut will first be closed to isolate the pipe section and any free liquid present in the pipe section will be drained and collected using a portable pump attached via tubing to an appropriate control valve system or by creating a small penetration in the bottom of the pipe section to allow the liquid to be drained and collected into a sealable collection vessel. Other sections of pipe may be temporarily left in place pending removal of other units. In all cases, ends of any pipe sections left in place (e.g., at pipe joints/pipe junctures) or at pipe cut locations will be capped or flanged using a blind flange, or, where necessary, a plug, molded rubber seal, and/or isolation gasket and fitted end cap. All sections of piping will be removed once all connected vessels/units have been removed.

Pipe removal/free liquid evacuation activities will be performed by personnel wearing appropriate PPE. Radiological data for the associated treatment units, piping, and other equipment will be used to determine approaches for piping/liquids removal and capping/flanging of pipe sections and for selecting appropriate PPE. A LANL RWP and IWD will be developed and used as appropriate to guide these activities.

4.1.9 Removal of Units and Associated Components

Following decontamination, units and their associated components will be removed. Depending on the size of the items (support pedestal, pan, palette, etc.) removal may include use of an excavator, forklift, container dollies, or other equipment. It is expected that removal methods will mimic those used to originally place them into each room. Section room walls or ceiling may be removed as necessary, however the integrity of the remaining structure must be maintained, or the entire structure will be removed, along with the unit.

Larger units may require size-reduction to meet transportation or disposal requirements. Specific methods used for size-reducing individual tanks or vessels, will depend on the composition and size of the item. Table 7 provides a summary of the characteristics of the various individual tanks and vessels comprising the LL RLW and TRU RLW treatment units. Equipment that might be used typically includes a diamond wire saw cutting system, metal saw, pipe cutter, or jackhammer.

The original (1963) clarifiers and gravity filter, which provide structural support for the RLWTF, will be size-reduced in place as will be other units. Additional measures may have to be taken for these units, however, in order to assure building structural safety while during cut-up and removal..

Removal of larger underground concrete structures such as the 75K Tank or the N25K and S25K Tanks in Structure 50-002 may involve partial demolition/segmentation of the tanks structures in place. In such instances, an excavator or backhoe with appropriate attachments (e.g., buckets, demolition shears) will be used to breakup and segregate material. If necessary, a Brokk® demolition/crusher unit or similar limited access demolition machine may be utilized to accomplish this task.

Removed tanks, vessels, components, and demolition debris will be segregated and placed into segregated waste staging areas. All waste material will be properly characterized, packaged, labeled, manifested, and transported offsite for disposal.

4.2 Grouping of Individual Units and Systems

4.2.1 LL RLW Units and Systems

The LL RLW collection system components, individual LL RLW treatment units, associated ancillary components to be closed are listed in Table 6. To facilitate closure and scheduling the individual units are grouped into categories or systems which will be closed together. For the LL RLW these categories or systems include:

- LLRLW Collection
- Influent Storage
- Main Treatment (Clarify)
- Main Treatment (IX\RO)
- Main Treatment (Filter)
- Main Treatment (Tanks)
- Secondary Reverse Osmosis
- Clean-in Place System
- Effluent Storage
- Effluent Mechanical Evaporation
- Tank Farm
- Solar evaporation tanks
- Canyon discharge piping and NPDES outfall 051

These groups may not necessarily be closed in sequence, but a basic objective will be to facilitate waste management for similar waste streams that are to be remediated together. A summary of the actions required to complete closure of the individual LL RLW treatment units, and closure duration estimates for completing closure of each group of units are presented in Table 6. Detailed descriptions of the capacity and construction of each individual a treatment unit (e.g., tank or vessel) are provided in Table 7.

4.2.2 TRU RLW Units and Systems

The TRU RLW collection system components, individual treatment units, and associated ancillary components to be closed are listed in Table 8. The individual units were grouped into categories which may be closed together to best facilitate closure. For the TRU RLW these categories include:

- TRU RLW Collection
- TRU Influent Storage
- TRU Treatment
- TRU solids cementation
- TRU Effluent

These groups may not necessarily be closed in sequence, but a basic objective will be to facilitate waste management for similar waste streams that are to be remediated together. Description of the individual unit's capacity and construction material are included in Table 7. A summary of the actions required to complete closure of the individual TRU RLW treatment units, and closure duration estimates for completing closure of each group of units are presented in Table 8.

4.2.3 Removal of Balance of Plant Facilities and Structures

Following removal of the individual treatment system units remaining facility and process systems (e.g., infrastructure, SCADA systems, natural gas system components, utilities, etc.) will be closed and removed. Once all such systems have been removed, the principal building and other major structures (e.g., concrete vaults holding tanks) will be demolished and removed. Table 9 identifies the facilities and support systems addressed as part of these balance of plant closure activities and provides estimated durations for closing these systems and for subsequently demolishing and removing principal structures. The balance of plant systems are grouped into categories to better facilitate description of, and preliminary sequencing of activities for closing these various systems. The general categories of the balance of plant systems to be closed are as follows:

- Processing support
- Infrastructure
- Utilities
- Building components and structures (i.e., the principal structures to be removed following removal of facility-wide and process systems)
- Stormwater systems

The various facility-wide and process systems will be closed once individual treatment units are decontaminated and removed and a structural assessment completed of the structure that housed these units. The facility and process systems exist across the RLWTF and will be closed in a generally sequential order; however, the specific order of systems closed might be adjusted between categories or within a particular group. For example, the schedule for closing and removing specific utilities might be staggered or delayed to allow for extended use for some utilities during a portion of the (subsequent) demolish/remove structures phase. It is projected that closure of all such systems and demolition and removal of all structures will be accomplished within about 420 days, with most of the removal of facility/process systems accomplished during the first 120 days and demolition and removal of principal structures completed within the last 300 days of that period.

Closure of these facility and process systems follows a similar approach as the individual treatment units. Systems will be isolated, drained or de energized as needed. Systems and equipment that may be reused or are sent for disposal as industrial waste would require radiological release surveys, and possibly decontamination. Material packaged and sent for disposal as LLRW or TRU waste, where applicable, may not require decontamination or radiological surveys.

Demolition and removal of principal building structures and other structures will be accomplished using excavators or backhoe fitted with appropriate attachments (e.g., buckets, demolition shears). As described previously, a Brokk® demolition/crusher unit or similar limited access demolition machine may be utilized to accomplish removal of some portions of building structures if necessary.

As above, these removal activities will be performed by personnel wearing appropriate PPE. Radiological data for the associated treatment units, piping, and other equipment will be used to select appropriate PPE. A LANL RWP and an IWD will be developed and used in combination with the applicable LANL DOP to guide these activities.

4.2.4 Processing of Demolition Materials/Debris

Removed sections of building structures and components will be placed into separate controlled staging areas onsite for subsequent processing. Waste will be segregated into the following:

- Uncontaminated bulk material or debris
- Potentially chemically impacted material or debris
- Radiologically contaminated material or debris
- TRU waste

The demolition materials will be segregated according to structure/material type site and based on the results of: (1) history of prior use of the portion of the structure demolished; and (2) results of radiological surveying/swipe samples collected for surfaces of the structures. As required, additional sampling will be conducted during processing of the removed demolition materials to confirm the most appropriate mode of final waste disposition.

Once the disposal requirements and modes are confirmed for materials, and debris, "clean" materials and debris will be loaded into bulk waste transport trucks fitted with proper tarp covers or following size reduction placed into DOT-approved waste shipping containers as required and the containers, labeled, manifested and loaded on flatbed trucks, trailers, or other appropriate vehicles for transport and off-site disposal. Low-level and TRU wastes will be packaged appropriately and staged for shipment to a facility licensed to dispose of such wastes following DOT and marking, labeling, manifesting, and shipping requirements.

4.2.5 Evaluation of Subgrade Conditions

After the removal of the major structures and units the foundation soils, surface or subsurface materials will be sampled to assess the possible residual chemical or radiological constituent concentrations above regulatory and risk-based limits and concentrations that are protective of ground water. NMED requirements for site assessment and verification and confirmation sampling will be followed. This activity is further described in Section 5 below.

5. Other Site Closure Activities

5.1 Surface Water and Groundwater Controls

During removal of treatment tanks and vessels and demolition of the principal structures, erosion control features will be installed around the perimeter of the working areas to contain runoff and migration of (potentially contaminated) sediments from the working areas and to minimize potential erosion of the ground surface from such runoff. Run-on controls will also be established as necessary to manage stormwater during closure.

Provisions will be taken during closure activities to prevent possible failures of temporarily stored waste containers (e.g., extreme weather changes). Such provisions will include management of the containers under a covered area or within an existing structure or the use of a temporary enclosure, or other appropriate controls as necessary.

Closure-generated wastes will be stored in appropriate containers within the facility. Storage vessels used to accumulate soil or liquid wastes will be appropriately containerized in accordance with regulatory requirements and applicable LANL procedures. Waste managed onsite will include the following controls as applicable:

- Wastes generated will be managed in containers within the facility;
- Containers will be compatible with the waste and the containers will remain closed unless being filled;
- Containers will be labeled to identifying the waste by type (e.g., radioactive or non-radioactive); and
- Spill control equipment will be provided adjacent to the container storage area(s).

5.2 Site Investigation/Characterization

The investigation, characterization, cleanup and corrective action requirements for potential releases of contaminants into soil, groundwater and other environmental media from "solid waste management units" (SWMUs) and "areas of concern" (AOCs) associated with the Facility and contained within the Consent Order of June 2016 entered into between the NMED and the Permittees pursuant to the New Mexico Hazardous Waste Act, NMSA 1978, §74-4-10 and the New Mexico Solid Waste Act, NMSA 1978,§74-9-36(D) shall be governed by the Consent Order. The investigation, characterization, cleanup and corrective action of any future SWMUs and AOCs associated with the Facility shall be conducted solely under the Consent Order and not under this Permit until termination of the Consent Order. No activities required under this Permit shall conflict with or duplicate activities required for SWMUs and AOCs identified under the Consent Order. Permittees shall provide information regarding which units and systems are covered by the Consent Order in the submittals required by Conditions VI.D.41 and VI.D.42 of this permit, along with a description of the investigation and characterization that will occur under the Consent Order for each unit and system.

5.3 Decontamination Methods

All equipment used during closure will be decontaminated and radiologically released in accordance with applicable LANL procedures. Where practical, volumetric release surveys as detailed in MARSAME may be used to support release. Any equipment, item or structure which cannot be decontaminated, or radiologically released will be packaged as waste and sent for disposal.

Portable berms or other such devices (e.g., membrane-wrapped hay bales, existing secondary containment) will be used to collect excess wash water derived from decontamination activities. Decontamination waste will be collected managed and segregated characterized in the same manner as closure waste. Based on the results of the analysis, the decontamination waste will be managed as low-level radioactive, non-hazardous, or TRU waste.

Decontamination of Equipment

Existing RLWTF equipment which is eligible for reuse may also be decontaminated and radiologically released. Operating machinery, equipment, tools and reusable sampling equipment, that is not sensitive to water intrusion, may be decontaminated by pressure washing or steam cleaning with a solution consisting of a surfactant detergent (e.g., Alconox®) or a decontamination solution (e.g., Radiacwash) and water mixed in accordance with the manufacturer's recommendations. Portable berms, or other such devices (e.g., absorbent socks, plastic sheeting, wading pools, existing secondary containment), will be used collect all wash water and provide containment during the decontamination process.

Equipment that is sensitive to water intrusion, e.g., electronic devices, some tools, will be decontaminated by washing using a wipe-down method with a solution consisting of a surfactant detergent or decontamination solution and water mixed in accordance with the manufacturer's recommendations. Quantities of wash solution used will be minimized by using buckets, spray bottles, or other types of containers. Cleaning cloths, or other absorbent cleaning devices, will not be reused to wipe down the equipment after being wetted in the wash solution or after spraying solution onto the equipment.

Decontamination of Structures

Decontaminating the interior structure may be accomplished using high-pressure washing, sponge media blasting, sluicing, scabbling (e.g., of a portion of the interior walls of a concrete treatment unit or secondary concrete containment structure), or similar processes. All decontamination waste, e.g., water and debris will be contained and properly characterized for disposal. Structures will be radiological surveyed and released in accordance with applicable LANL procedures. Structures and related equipment that are radiologically released will be considered industrial wastes. Any structure that is not radiologically released may be demolished and sent for disposal as LLRW or TRU waste.

Subgrade Conditions Assessment and Excavation

The foundation (subgrade) soils beneath the removed structures will be sampled to identify residual contamination in soils. Samples will be collected of the subgrade soils in accordance with requirements specified in a Sampling and Analysis Plan (See Section 5) and may include sampling in areas considered most susceptible for exhibiting residual contamination. If deemed appropriate at the time of the sampling assessment, soil samples may be collected from other locations exhibiting visible soil staining or at suspected or known locations of past spills (based on facility operational records) and submitted for laboratory analysis.

If soil is confirmed as being radiologically impacted or exhibiting hazardous constituent concentrations above regulatory or risk-based limits it will be removed and containerized, labeled, and properly manifested pending its final transport and disposal at an appropriate off-site disposal facility. The facility footprint will be radiological surveyed following removal of the identified residual contamination and be released in accordance with applicable DOE and LANL procedures.

5.4 Site Reclamation

Upon completion of the removal of systems, structures or contaminated subgrade soils, the footprint area formerly occupied by the current RLWTF will be regraded to conform with the surrounding natural site grade and conditions and minimize water run-on and run-off. Soil will be placed backfilled and compacted as engineered fill.

Depending on the desired end use, specific regraded areas will then either receive a layer of topsoil and the area will be reseeded with native plant species seeds to promote vegetation growth, or, the area may be regraded to appropriate engineered specifications to accommodate future facility use.

5.5 Post-Closure Monitoring, Maintenance and Repair, and Controls

Final closure of the RLWTF will result in the complete removal of all existing LL RLW and TRU RLW treatment units, process systems and structures comprising the existing RLWTF. Additionally, potential residual contamination in subgrade soils underlying the removed RLWTF structures will be characterized and assessed in accordance with requirements established under the Consent Order (See Section 5.2.) Corrective actions for soils exhibiting radiological and/or chemical constituents at concentrations above regulatory and risk-based limits and/or concentrations that are protective of ground water will be established in accordance with the Consent Order and DOE Order 458.1.

Implementation of the final closure activities will effectively remove all sources of potential radiological or chemical constituents to air, soil and groundwater, and surface water. This should minimize the need for completing post-closure monitoring, maintenance and repairs, and implementation of active or administrative post-closure controls within the footprint area of the existing RLWTF.

5.6 Groundwater Monitoring Plan

Post-closure groundwater monitoring will be conducted at the same wells as that used for operational monitoring, specifically:

- Two new alluvial wells (currently unnamed) located hydrologically downgradient of Outfall 051;
- MCOI-6 - previously constructed and located within perched-intermediate groundwater beneath Mortandad Canyon;
- R-46 - located in the regional aquifer downgradient of the RLWTF;
- R-60 - located in the regional aquifer downgradient of the RLWTF;
- R-1 - located in the regional aquifer downgradient of the RLWTF; and
- R-14 - located in the regional aquifer downgradient of the RLWTF

The groundwater monitoring plan will focus on contaminants that were associated with RLWTF and have the potential to migrate to groundwater (e.g., nitrate, perchlorate, flouride). In the event that groundwater contaminants associated with operations conducted at RLWTF under this permit are detected in any of the wells, an assessment of the condition would be performed, and mitigation may be conducted. An important part of the assessment would be the evaluation of whether a new condition(s) arose in any of the wells associated with operations under the groundwater discharge permit. If mitigation is necessary, sampling will be conducted at applicable wells on a quarterly basis for a minimum of eight consecutive quarters after achieving the standards of NMSA 20.6.2.3103.

5.7 Characterization of Wastes Generated

For documentation purposes, wastes generated during final closure (e.g., treatment residues, contaminated demolition debris, contaminated soil, etc.) will be characterized through sampling and analysis of the wastes to verify waste constituents present and to identify appropriate disposal options for those wastes. Wastes generated during closure will be characterized as follows:

- Representative samples of water, solids, or bottoms, as appropriate, will be collected from tanks and vessels. These samples will be analyzed for appropriate indicator radionuclide constituents (alpha and beta emitters and tritium) and RCRA toxicity-characteristic metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver);
- Additional analyses may be included based on the tank or vessel being sampled and the historic waste streams handled; for example, following evacuation of liquid and/or solids from tanks and pipe sections that contained or conveyed acids (e.g., nitric acid used in treatment of TRU RLW acid influent treatment in Room 60 of Building 50-001; sulfuric acid used for pH adjustment in Room 34B of Building 50-001). Residual waste liquids or solids may be sampled and analyzed for: (1) RCRA toxicity-characteristic metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); and (2) the RCRA corrosivity characteristic; and
- As warranted by observations and sample results obtained during decontamination activities, combined with consideration of knowledge or past processes, samples may be collected of solids/scale on the interior wall of selected sections of piping to verify the presence and concentrations of radionuclides, RCRA toxicity-characteristic metals

(arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver); and RCRA corrosivity characteristic.

Soil samples will also be collected at selected locations from the subgrade soils beneath the areas formerly occupied by the principal RLWTF principal structures to identify residual impacted soils. Excavated soils will be sampled to confirm concentrations of residual contaminants present and to confirm waste classification for disposal.

All liquid, solids, debris, treatment residues, and soil samples will be analyzed in accordance with LANL waste analysis procedures and applicable local, State, and Federal regulations. Prior to initiating closure activities, a Sampling Analysis Plan will be generated to identify the appropriate methods based on the historical LL RLW and TRU RLW streams treated in the existing RLWTF.

5.8 Dispositioning of Wastes Generated

Closure activities are likely to generate several different types of waste materials, including nonhazardous industrial wastes, LLRW and TRU wastes. Potential wastes that may be generated are listed in Table 10 along with potential disposal/treatment options. All waste generated during closure will be managed, controlled, handled, characterized, and disposed of in accordance with established LANL waste management procedures and applicable local, State, and Federal laws and regulations.

Waste generated from closure activities will be segregated based on the potential contaminates present in the waste. Particular attention will be focus on limiting the generation of TRU waste, and all waste material will be segregated based on the potential disposal options. The segregated waste will be sampled as necessary to properly characterize the waste, ensure proper waste packaging, labeling, manifesting and acceptance at the applicable disposal facility.

Waste material (liquids and solids) present inside the individual treatment units and vessels will be removed and processed following existing DOPs. To the extent practicable, evacuated wastes will be processed on-site at the replacement RLWTF or may be otherwise treated onsite or off site to meet Land Disposal Restrictions (LDR). Waste material that may require additional treatment (solidification, etc.) prior to disposal will be manifested and transported to a licensed treatment facility (e.g., solidification and drumming of certain TRU residual wastes for subsequent shipment to WIPP). Waste will be packaged and transported in accordance with applicable DOT regulations.

Decontaminated equipment and structures may be reused or sent for recycling if they are radiologically released under applicable DOE and LANL procedures. Equipment that is volumetrically contaminated will be evaluated using DOE and LANL procedures for radiological release. Disposable equipment and other equipment that cannot be decontaminated will be containerized and managed as waste.

5.9 Closure Schedule

An integrated closure schedule has been developed that provides projected timetables and estimated durations for completing various steps (phases) required for closing the RLWTF. Figure 4 presents a preliminary closure schedule and provides an anticipated sequence for completing RLWTF closure activities. The schedule would be re-visited and revised prior to the start of Final Closure, and prior to the completion of changes such as replacement low-level and transuranic facilities.

Key phases of the closure work included in the schedule are as follows:

- Stabilization of units in accordance with Condition 41 of DP-1132. Stabilization will include emptying the units of solids and liquids, and isolation so new wastes cannot be introduced to the units. The unit may not be physically decommissioned or removed, but it will pose no threat to the environment or groundwater.
- Through the Consent Order, the NMED will establish the priority for RLWTF closure, which will establish a closure start date.
- Submit an amended Closure Plan to NMED for approval, based upon the Consent Order start date.
- Procure closure contractor(s)
- Implement closure activities including:
    - Decontaminate, decommission, and remove individual treatment units
    - Complete structural assessments of principal structures
    - Remove balance-of-plant facility-wide and process systems
    - Demolish and remove buildings/principal structures
    - Size-reduce, sample, package, manifest, and ship waste materials for disposal
    - Perform verification sampling
    - Restore site
- Prepare and receive approval of Closure Report

Stabilization of existing low-level treatment equipment in Building 50-001 is currently scheduled to start in the first quarter of 2019. This schedule start is contingent upon the current construction schedule, NMED issuance of DP-1132, and NMED concurrence to begin operations in the new low-level treatment facility. This start date also allows for a 12-month probation period for the new facility, during which time the existing low-level treatment facility is maintained in a state of readiness. As figure 4 shows, stabilization would require a little less than two years. Stabilization will leave treatment equipment empty and disconnected, so that it cannot receive additional radioactive liquid waste.

Figure 4 shows that stabilization will be followed by closure. Start date for closure, however, will be dependent upon design and construction of the replacement treatment facility for transuranic RLW because Building 50-01 will continue to be needed for transuranic RLW treatment. Closure start date will also depend upon prioritization assigned under the NMED Consent Order. This Closure Plan will be amended and submitted to the NMED as dates for these future events firm.

Once a closure start date has been established, closure activities are estimated to require two years, not including post-closure monitoring. Table 6, Table 8, and Table 9 provide descriptions of selected activities and additional details regarding estimated durations required for closing and removing each LL RLW and TRU RLW treatment unit and the "balance-of-plant" facility and process systems, respectively.

5.10 Final Closure Report

Consistent with DP-1132, proposed Condition VI.D.43 (Final Closure), once closure begins, and until all closure requirements (excluding post-closure ground water monitoring) are completed, LANL will submit quarterly status reports to NMED describing the closure actions taken during the previous reporting period and the actions scheduled for the next reporting period.

Within 90 days of completing closure activities, LANL will submit a final written report for approval on the actions taken to implement closure to NMED, in accordance with DP-1132, proposed Condition VI.D.43.

6. References

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APPENDIX A
TABLES

Table 1. Timeline of Facility Operations and Facility/Process Modifications– RLWTF

Year/Date of Operation	Aspect of Facility Operation/Facility or Process Addition or Modification
1961 – 1963	Construction of the TA-50 RLWTF
June 27, 1963	TA-50 RLWTF receives first RLW influent
1978	Obtained NPDES Discharge Permit for Discharge Outfall 051 in Mortandad Canyon
1979	Constructed transuranic collection system, structure TA-50-066 to provide transuranic influent storage, and treatment equipment in Room 60. .
July 1979	Created first drum of cemented transuranic solids
1983	Completed the new low-level RLW Collection System, with double-walled piping and leak detection capability at 62 access vaults along the four miles of piping. Majority of the original collection system was decommissioned and removed.
1983	Sanitary wastes sent to the TA46 sewage plant instead of to a septic system with leach field at TA50. Septic system was removed.
1982	Constructed TA-50-090 to provide additional influent storage capacity for low-level RLW waste streams.
1983 – 1984	Enclosed the Room 60 drum tumbler, and began exhausting enclosure emissions through HEPA filters.
1994	Added an emergency power generator in northeast corner of TA-50-001 and replaced main power transformer for TA-50-001.
1995	Replaced TRU RLW acid tank in WM-66
1996	Installed steel 17K Tank in underground concrete tank south of the 75K Tank.
1997	De-scaled internal surfaces of clarifiers then applied epoxy-based paint to cleaned surfaces.
1997	Installed four 20,000-gal above-ground storage tanks in concrete basin in Building 50-248 to provide secondary containment with leak detection capability.
1996-1999	Installation of advanced membrane treatment units (ultrafilter and reverse osmosis) in treatment rooms on the east side of Building 50-01 in response to reduced discharge limits for radioactivity in treated water released to the environment.
2000	Sandblasted interior walls of N25K and S25K Tanks clean and applied impermeable epoxy paint to cleaned walls.
2001	Began use of gravity filter effluent for clarifier chemicals, thereby reducing secondary waste generation rates.
2002	Added perchlorate ion exchange columns per anticipated EPA regulations.
2003	Removed solids from 25,000-gal in-ground, single-walled concrete tank located southwest of N25K and S25K Tanks in Building 50-02.

Table 1. Timeline of Facility Operations and Facility/Process Modifications-- RLWTF

Year/Date of Operation	Aspect of Facility Operation/Facility or Process Addition or Modification
2010	Added Cu-Zn ion exchange columns to polish permeate from the primary RO unit.
2010	Installed structure TA-50-257 including natural-gas fired boiler/evaporator for evaporation of treated low-level RLW.
2010	Completed construction of Building TA-50-250 (Waste Management/Risk Mitigation Facility) housing six new 50,000-gal storage tanks.
Jan 2, 2011	First evaporation of treated water.
2011	Installed secondary reverse osmosis unit in Room 24
2012	Completed construction of lined Solar Evaporation Tanks (SETs) at TA52 to create an alternative to evaporation using natural gas.
2013	Completed facility modifications and process upgrades per anticipated requirements of a Ground Water Permit.

Table 2. Principal Structures, Units, and Components to be Closed – Low-Level RLW System

Structure	Year Built	Description of Structure	Associated LLW Treatment Units *[and other components]*	No. in Permit Application/ Room No. in Structure
50-001 50-002	1963	RLWTF	• N.A.	• N.A.
N.A	1982	RLWCS	• Low-level RLW collection system, including Piping and access vaults and vault alarms.	• M1
50-001	1963	Influent Storage	• Neutralization Chamber (Tank TK-13) and associated piping	• N.A. / Rm 16
50-248	1963	Influent Storage: Below-grade concrete storage tanks structure	• 17K Tank (untreated RLW storage)	• S3
50-002	1963	Influent Storage: Below-grade concrete storage tanks structure	• 75K Tank (untreated RLW storage)	• N.A.
50-090	1986	Influent Storage: Above-ground 100K LL RLW influent storage tank (Tank WM2-N)	• 100K Tank (untreated LL RLW Influent storage tank)	• N.A.
50-250 (WMRM facility)	2010	Influent and Emergency Influent storage facility	• Influent Storage Tanks TK5 and TK6	• M2 / 50-250 Building
50-250 (WMRM facility)	2010	Emergency Influent storage facility	• Emergency influent storage tank TK-1,2,3,4	• M3 / 50-250 Building
50-001	1963	Main treatment process	• Clarifier #1 and Clarifier #2 and Grit Chamber (idle)	• N.A. / Rm 16
50-001	1963	Main treatment process	• Gravity Filter	• N.A. / Rm 16
50-001	2011	Main treatment process	• Pressure Filters	• M6 / Rm 63
50-001	2012	Main treatment process	• Microfilter	• M5 / Rm 70A
50-001	1996	Main treatment process	• Reaction tanks TK-71 and TK-72	• M4 / Rm 70

Table 2. Principal Structures, Units, and Components to be Closed – Low-Level RLW System

Structure	Year Built	Description of Structure	Associated LLW Treatment Units *[and other components]*	No. in Permit Application/ Room No. in Structure
50-001	1996	Secondary treatment process	• Tank TK-73	• S1 / Rm 70
50-002	1996	Main treatment process	• Centrifugal Ultrafilter (idle)	• N.A. / Rm 71
50-001	1963	Main treatment process	• 5,000-gallon storage tank (idle)	• N.A./Outside TA-50-001, Rm 59
50-002	1963	Main treatment process	• Former Low Level solids storage tank (TK-7)	• N.A./ TA-50-002
50-001	2010	Main treatment process	• IX vessels (Cu-Zn)	• M9 / Rm 34B
50-001	2002	Main treatment process	• IX vessels (12) (Perchlorate)	• M7 / Rm 16
50-001	1963	Main treatment process	• Tank TK-9	• S2 / Rm 62
50-001	1963	Secondary treatment process	• Rotary Vacuum Filter (Secondary Treatment)	• S2/ Rm 116B
50-001	1963	Secondary treatment process	• Tank TK-8 (Storage of low-level filtration solids)	• S2 / Rm 61
50-001	1963	Secondary treatment process	• Tank TK-25/Secondary RO units SRO-1; SRO-2 (Secondary RO)	• S1 / Rm 24
50-001	1963	Main treatment process	• Membrane Clean-in-Place System	• N.A.
50-001	1963	Clean-in-Place System	• TK-74	• N.A.
50-001	1963	LLW Effluent Storage	• North and South Frac Tanks	• M10 / Rm 34B
50-257	2011	Effluent Evaporator	• Natural Gas-Fired Evaporator	• M11 / Structure 50-257
50-002	1997	Secondary treatment process	• 3K tank	• S3 / Structure 50-002
50-002	1963	Secondary treatment process	• North Tank (N25K) and South Tank (S25K)	• WM2-N and WM2-S/ Structure 50-002
50-248	1963	Secondary treatment process	• Tanks TK-NE, TK-SE, TK-SW, and TK-NW	• S3/ Structure 50-248

Table 2. Principal Structures, Units, and Components to be Closed – Low-Level RLW System

Structure	Year Built	Description of Structure	Associated LLW Treatment Units *[and other components]*	No. in Permit Application/ Room No. in Structure
52-181 52-182 52-183	2010 2012	Solar Evaporation Treatment (SET)	• Effluent evaporation basins, pump house, and associated cross-site below-grade piping	• M11 / Located in TA- 52
50-250	2010	Piping	• Return line from WMRM Facility (Structure 20-250) to Structure 50-001	• N.A.
Outfall #051	N.A.	NPDES Discharge outfall	• Discharge Pipe	• N.A.
50-002	1963	Below-grade concrete storage tanks structure	• Main wastewater treatment system pumps, and effluent pumps for discharging treated water to Mortandad Canyon	• N.A./ Structure 50-002
50-002	1963	Below-grade concrete storage tanks structure	• Overflow piping from 75K and 17K Tanks to a sump equipped with sump pumps and piping to the 100K Tank in Structure TA-50-90	• N.A./ Structure 50-002
50-090	1986	Above-ground 100K LL RLW influent storage tank (Tank WM2-N)	• Secondary containment system including dike wall and connective piping to the 17K Tank in Structure 50-002	• N.A./ Structure 50-090

Table 3. Historic Waste Streams Handled: Low-Level RLW Treatment Units

Structure	Description	LL RLW Treatment Unit	Historic Waste Streams Handled
Multiple	LL RLW collection system	LL RLW collection system components, including doubled-walled piping, collection vaults, and probes for leak detection.	influent from facilities that generate LL RLW.
50-001	Main treatment plant housing LLW treatment equipment, analytical labs, utilities, and offices	Clarifiers (CLI-1 and CL-2)	Low-level RLW influent; lime (calcium hydroxide), caustic soda (sodium hydroxide), and iron sulfate additives to precipitate impurities, including radionuclides.
		Gravity Filter	Chemically treated low-level RLW influent from clarifiers. Radioactive concentrations in feed to the Gravity Filter were 85% - 95% reduced from influent concentrations, except for tritium.
		Reaction Tanks TK-71; TK-72	Low-level RLW influent mixed with chemicals such as lime, sodium hydroxide, ferric sulfate, and magnesium sulfate added to adjust pH, precipitate metals, and promote particle growth.
		Microfilter	Treated influent (solid/water mixtures) from reaction tanks TK-71, TK-72 are filtered to separate solids from water.
		Pressure Filters	Treated influent from the clarifiers, the gravity filter, and TK-71 or TK-72 are run through media consisting of coarse- and fine-sized particles of sand, garnet, coal, and gravel.
		Perchlorate Ion Exchange Unit	Filtrate from TK-9 for perchlorate removal prior to treatment in Primary RO Unit.
		Storage Tank TK-9	Receives filtrate from microfilter and pressure filters. Receives permeate from Secondary RO. Additives for pH adjustment.
		Primary RO Unit	Fed from Tank TK-9.
		Cu-Zn Ion Exchange Unit	Permeate from Primary RO Unit in Room 72 run through ion exchange resin bank(s) using makeup water drawn from one of the two Frac Tanks.
		Effluent Storage (North and South Frac) Tanks in Room 34B	Permeate from Primary RO Unit.

Table 3. Historic Waste Streams Handled: Low-Level RLW Treatment Units

Structure	Description	LL RLW Treatment Unit	Historic Waste Streams Handled
50-001		Tank TK-73 (Secondary RO) 3,700-gal tank in Room 70A	Concentrate from the Primary RO Unit.
		Tank TK-25 (Secondary RO) 300-gal tank and SRO-1 and SRO-2 in Room 24	Concentrate from Tank TK-73.
		Solids Storage Tank TK-8	Solids from microfilter or pressure filters.
		Rotary Vacuum Filter	Solids from TK-8 (rotary vacuum filter).
		5,000-gal storage tank (idle)located outside of Room 59.	Nitric acid.
50-002	Below-grade concrete storage tanks structures	75K Tank	Storage of influent from LL RLW collection system.
		17K Tank	Storage of LL RLW influent from LL RLW collection system Storage of RLW bottoms
		N25K and S25K Tanks (treated LL RLW storage)	1963-2000: Storage of treated water from main treatment process having alpha-emitting radionuclide concentrations <1 nCi/L. 2000–2010: Storage of overheads from waste evaporator containing trace radionuclides and no solids. 2011–Present: Storage of drain waters from the effluent evaporator having concentrations of alpha-emitting radionuclides <10 nCi/L and no solids.
		Emptied/abandoned concrete solids storage tank (25,000 gallon).	Storage of LL RLW solids
50-090	Above-ground 100K Storage Tank	100K Tank	Storage of LL RLW influent on as-needed basis. Storage of RLW bottoms on an as-needed basis.

Table 3. Historic Waste Streams Handled: Low-Level RLW Treatment Units

Structure	Description	LL RLW Treatment Unit	Historic Waste Streams Handled
50-248	Secondary low-level RLW and Bottoms Storage Facility	3K Tank (mixing/transfer tank)	• Storage of LL RLW influent from LL RLW collection system • Storage of RLW bottoms
		Storage Tanks – NE, SE, SW, and NW	Storage of concentrate from the Primary RO Unit. Storage of RLW bottoms
50-250	Influent and emergency influent storage facility	Influent Storage Tanks TK-5,6	Storage of low-level RLW influent
		Emergency Influent Storage Tanks TK-1,2,3,4	To date: industrial water used to calibrate level probes Potential: low-level RLW influent
52-181 52-182 52-183	Solar Evaporation Tanks (SET)	Geomembrane-lined concrete effluent evaporation tanks (two) and pump house	To date: rainwater Potential: Treated water received from low-level RLW treatment process.

Table 4. Principal Structures and Individual Units to be Closed – TRU System

Structure	Year Built	Description of Structure	Associated TRU LLW Treatment Units [and other components]	No. in Permit Application/ Room No. in Structure
TA-50, TA-55, 50-201	1979	TRU RLW collection system	TRU RLW collection system components	T1 / N.A.
50-066, 50-107	1979	Below-grade TRU RLW influent storage tanks	• Acid waste tank (original tank replaced in 1995)	• T2/ Structure TA-50-66 (Vault WM-66)
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Treatment tanks TK-1 and TK-2	• T3 / Rm 60
50-001	1979	TRU treatment equipment, process tanks, and utilities	• TK-4 (idle)	• Rm 60A
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Clarifier CL-1 (idle)	• Rm 60
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Tank TK-6	• Rm 60A
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Tank TK-7 (idle)	• Rm 60A
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Pressure filter	• Rm 60
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Decant filter (idle)	• Rm 60A
50-001	1979	TRU treatment equipment,	• Piping	• Rms 60 and 60A

Table 4. Principal Structures and Individual Units to be Closed – TRU System

Structure	Year Built	Description of Structure	Associated TRU LLW Treatment Units [and other components]	No. in Permit Application/ Room No. in Structure
		process tanks, and utilities		
50-001	1979	TRU treatment equipment, process tanks, and utilities	• Drum tumbler (original tumbler was replaced in 2007)	• T4 / Rm 60A
50-001	2007	TRU treatment equipment, process tanks, and utilities	• TK-7A	• T4 / Rm 60A
50-001	1979	TRU treatment equipment, process tanks, and utilities	• TK-3	• T5 / Rm 60
50-066, 50-107	1979	Below-grade TRU RLW influent storage tanks	• Caustic waste tank (replaced in 1983 and again in 2007)	• T2/ Structure TA-50-66 (Vault WM-66)
50-066, 50-107/50-001	1979	Below-grade TRU RLW influent storage tanks	• Piping *[two double-wall transfer pipes connecting Acid and Caustic waste tanks to Tank TK-1 in Rm 60 of Building 50-001]*	• T2/Multiple
50-066, 50-107/50-001	1979	Below-grade TRU RLW influent storage tanks	• Valves	• T2/Multiple
50-066	1979	Below-grade TRU RLW influent storage tanks	• Sump with transfer/ recirculation sump pump	• N.A./ Structure TA-50-66
50-066	1979	Below-grade TRU RLW influent storage tanks	• Ventilation system with exhaust through pre-filter and two stage high efficiency particulate air (HEPA) filter	• N.A./ Structure TA-50-66
50-066	1979	Below-grade TRU RLW	• Fabric and metal frame cover enclosure	• N.A./ Structure TA-50-66

Table 4. Principal Structures and Individual Units to be Closed – TRU System

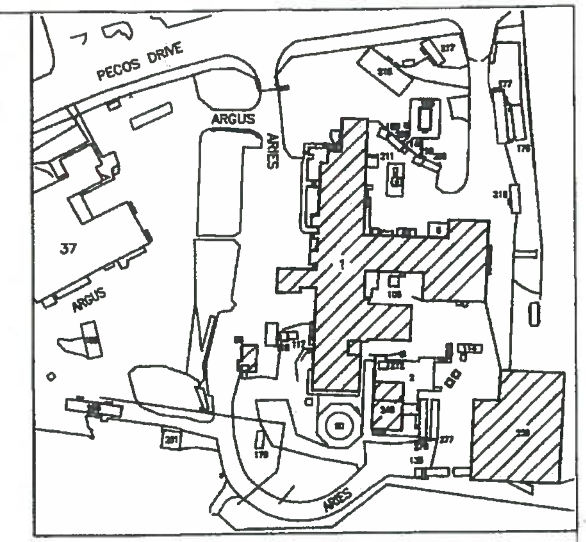
Structure	Year Built	Description of Structure	Associated TRU LLW Treatment Units [and other components]	No. in Permit Application/ Room No. in Structure
		influent storage tanks		
50-066	1979	Below-grade TRU RLW influent storage tanks	• Structure TA-50-107 - A sampling shed for obtaining liquid samples from the acid and caustic RLW storage tanks	• SN.A./ Structure TA-50-66
50-201	1979	Below-grade reinforced concrete TRU RLW valve pit/valve station in Vault WM-201	• Vault with sump and valve station	• N.A./Structure 50-201 (Vault WM-201)
50-201	1979	Below-grade reinforced concrete TRU RLW valve pit/valve station in Vault WM-201	• Double-wall and single-walled piping	• N.A./Structure 50-201
50-201	1979	Below-grade reinforced concrete TRU RLW valve pit/valve station in Vault WM-201	• Steel frame building with sheet metal sides and roof covering valve pit	• N.A./Structure 50-201 N.A./Structure 50-201

Table 5. Historic Waste Streams Handled: Transuranic RLW Treatment Units

Structure	Description	TRU RLW Treatment Unit	Historic Waste Streams Handled
50-001	TRU treatment equipment, process tanks, and utilities	Treatment Tank TK-1	Acid and caustic TRU RLW influent from Tanks AWT-001 and CWT-001. Acid influent is neutralized by mixing with liquid sodium hydroxide; other chemicals (ferric sulfate or polymer) may be added to promote particle growth
		Treatment Tank TK-2	Neutralized acid TRU RLW or un-neutralized liquids from Tank TK-1
		Solids Storage Tank TK-7A	Settled-out solids formed in the neutralized waste and caustic waste influent from Tank TK-1; TK-7A may be seeded with solids left over from the previous treatment campaign and/or chemicals (lime, ferric sulfate, or polymer) to facilitate particle growth
		Effluent Tank TK-3	Water decanted from Tank TK-7A and treated liquid from Tank TK-1 following neutralization
		(Metering) Tank TK-6 (20-gal)	Solids from Tank TK-7
		Drum Tumbler	Solids from TK-7A and Tank TK-6 is mixed in cement and sodium silicate then tumbled to form solidified waste form in drums for off-site disposal (at WIPP)
		Tanks TK-4; TK-7; decant pressure filter – Rooms 60 and 60A	Tank TK-4 and decant pressure filter are installed and available for use if needed. Tank TK-7 has experienced wall corrosion from previous service and is not used for treatment. Tank TK-7 is believed to contain negligible quantity of radioactive material.
50-066	Below-grade TRU RLW influent storage tanks	Acid TRU RLW influent storage tank (AWT-001; 3,900-gal)	TRU RLW influent received in discrete batches from valve pit/valve station in Vault WM-201.
		Caustic TRU RLW influent storage tank (CWT-001; 3,000-gal)	
50-201	Below-grade reinforced concrete TRU RLW valve pit/valve station in Vault WM-201	Vault with sump and valve station	TRU RLW influent received from Building 55-04 (via TRU RLW Collection System)

Table 5. Historic Waste Streams Handled: Transuranic RLW Treatment Units

Structure	Description	TRU RLW Treatment Unit	Historic Waste Streams Handled
50-248	Treated secondary TRU RLW and bottoms storage facility	Storage tanks (4) – NE, SE, SW, and NW tanks	Storage of treated water from the TRU RLW treatment system units for disposition as bottoms.
N.A	TRU RLW collection system	TRU RLW collection system components	Collection/temporary storage/conveyance of TRU RLW influent from TRU RLW collection system.



LOCATION PLAN
SCALE: NONE TA–50

GENERAL NOTES

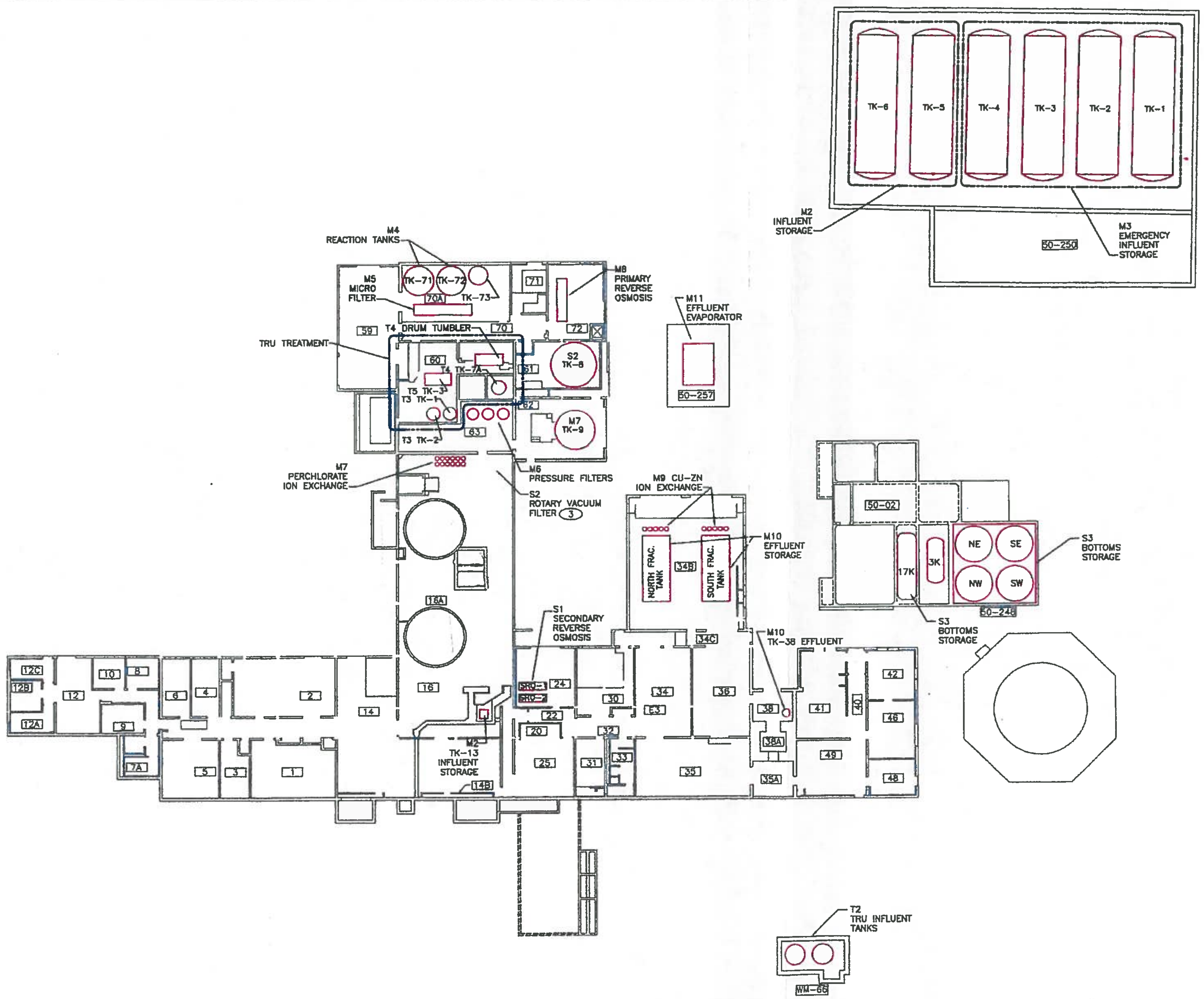
1. IF THIS SHEET IS NOT 11X17, THEN IT IS A REDUCED OR ENLARGED SIZE PLOT. USE INDICATED SCALE ACCORDINGLY.

KEYED NOTES

1 SCALE APPLIES TO BUILDING STRUCTURES AND RELATIVE BUILDING LOCATIONS WITHIN THE SITE. DEPICTED SIZE OF TREATMENT UNITS AND STORAGE TANKS ARE FOR REFERENCE ONLY.

2 TREATMENT UNIT NOT SHOWN ON SKETCH.

3 ROTARY VACUUM FILTER LOCATED THIS AREA SOUTH–EAST CORNER RM. 116A

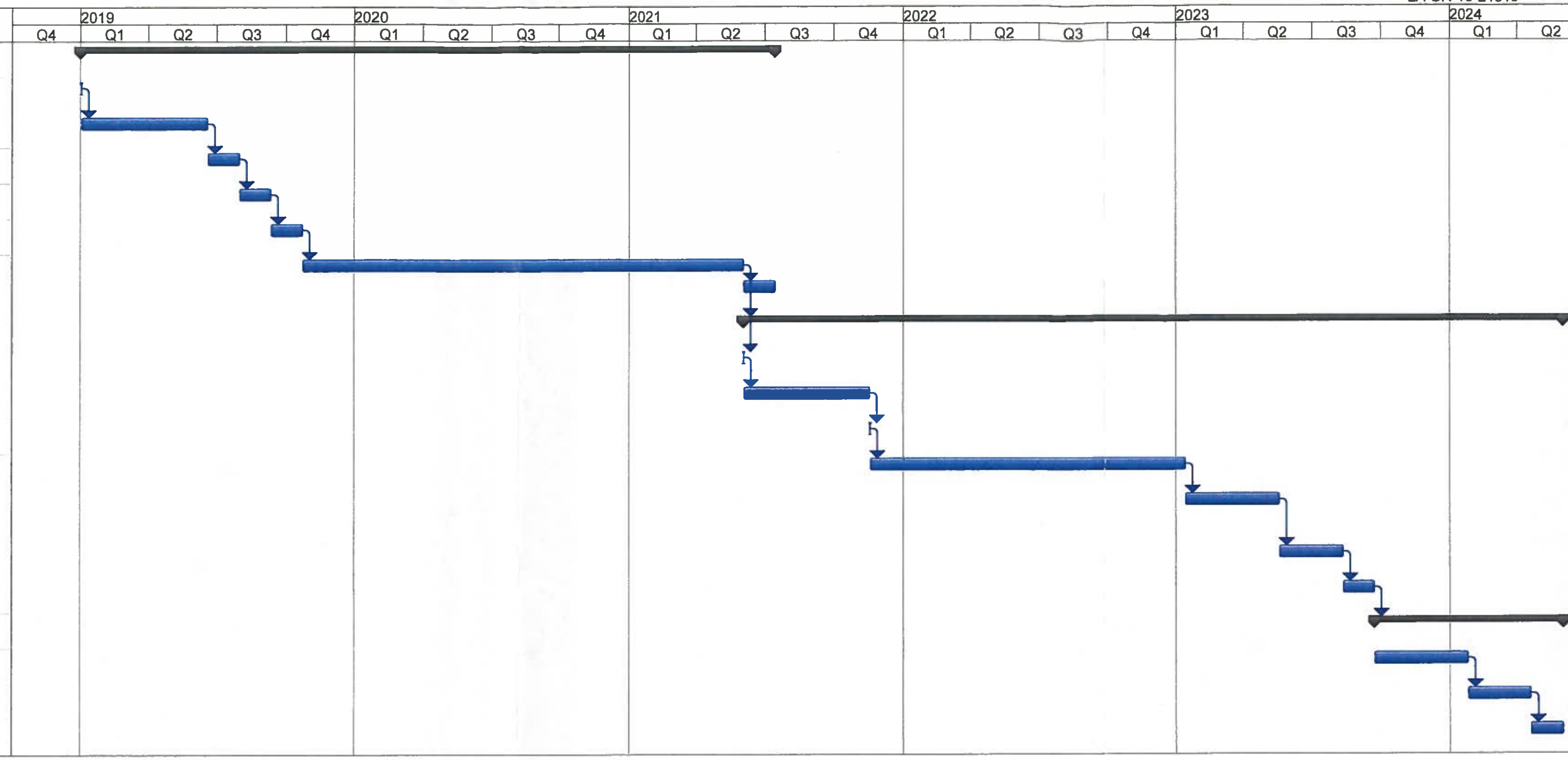


N RLWTF TREATMENT UNITS
SCALE: 1/8" = 4'–4" 1

	RLWTF TREATMENT UNITS	
2	M1	COLLECTION SYSTEM
	M2	INFLUENT STORAGE
	M3	EMERGENCY INFLUENT STORAGE
	M4	REACTION TANKS
	M5	MICRO FILTER
	M6	PRESSURE FILTERS
	M7	PERCHLORATE ION EXCHANGE
	M8	PRIMARY REVERSE OSMOSIS
	M9	COPPER ZINC ION EXCHANGE
	M10	EFFLUENT STORAGE
	M11	EFFLUENT EVAPORATOR
2	M11	SOLAR EVAPORATION
2	M11	NPDES OUTFALL #051
2	T1	TRU COLLECTION SYSTEM
	T2	TRU INFLUENT STORAGE
	T3	TRU TREATMENT
	T4	TRU SLUDGE
	T5	TRU EFFLUENT
	S1	SECONDARY REVERSE OSMOSIS
3	S2	ROTARY VACUUM FILTER
	S3	BOTTOMS STORAGE

Figure 2. RLWTF Location and Treatment Units

ID	Task Mode	Task Name	Duration
1		**Stabilization**	**661 days**
2		Cessation of Operations	1 day
3		Submit Stabilization Plan to NMED	120 days
4		NMED Review and Comment	30 days
5		Submit Revised Stabilization Plan to NMED	30 days
6		NMED Approval of Stabilization Plan	30 days
7		Stablization	420 days
8		Stabilization Report Submitted to NMED	30 days
9		**Closure Activities**	**782 days**
10		Cessation of Operations	1 day
11		Submitt Revised Closure Plan to NMED	120 days
12		NMED Determines Closure Start Date	1 day
13		Demolish and Remove Buildings	300 days
14		Size Reduce, Sample, Package, Manifest, and Ship Waste Materials	90 days
15		Verify Sampling in Soils	60 days
16		Site Restoration Activities	30 days
17		**Reporting**	**180 days**
18		Submit Draft Closure Report to NMED	90 days
19		LANL Receive/Respond to Comments	60 days
20		NMED Final Closure Report Approval	30 days



In accordance with Condition 46 of the Groundwater Permit, closure of the RLWTF shall be conducted solely under the NMED Consent Order of June 2016 and not under the Ground Water Permit. Through the Consent Order, the NMED establishes priorities for characterization, cleanup and closure of SWMUs and AOCs across LANL. Therefore, actual start date for closure of the RLWTF will be dependent upon the Consent Order process, and may differ from the start date indicated in this schedule.

Project: LANL Closure Plan 112415
Date: Fri 2/26/16

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

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Table 6. Closure Actions and Estimated Durations for Low-Level RLW Treatment Units

LL RLW Category	Closure Duration Estimate [1]	Permit Application No.	Vessel/ Item	Room # in 50-001	Other Buildings	Isolate unit	Collect liquid &/or solids sample for analysis	Evacuate (pump or drain) free liquid &/or solids	Route removed liquids/solids to replacement RLWTF for treatment	Decontaminate unit (wash, scabble)	Demolish and remove secondary containment systems	Radiological Survey	Apply Fixative or Paint	Remove treatment unit or vessel & associated components	Size reduce/segment larger removed tanks/vessels if required	Complete Structural Assessments[1]	Demolish and remove structure(s) [1]	Collect subgrade soil sample(s) after removal of structure/unit [1]	Package/ship off-site for processing (e.g., solidification) or disposal off-site[1]
LL RLW Collection System (RLWCS)	NA		Cross Country Line	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
		M1	Various piping	NA	TA-03, TA-35, TA-48, TA-50, TA-55, TA-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
		M1	Vaults (62), incl. WM-72	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
			Floor Drains and Sumps	Multiple	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA
Influent Storage	120 days		Piping	Multiple	NA	X	X	X	X	X		X		X	X		X		X
		M2	Neutralization Chamber (TK-13)	16	50-002	X	X	X	X	X	X	X		X	X		X		X
			17,000-gal Tank	NA	50-002	X	X	X	X	X	X	X	X	X	X		X		X
			75,000-gal Tank	NA	50-002							X	X	X	X		X	X	X
			100,000-gal Tank	NA	50-090							X	X	X	X		X	X	X
		M2	WMRM tanks (2)	NA	50-250	X	X	X	X	X		X		X	X		X		X
		M3	WMRM tanks (4)	NA	50-250	X	X	X	X	X		X		X	X		X		X
		M2/M3	Return line: WMRM to 50-001	NA	50-250	X	X	X	X	X		X		X	X		X		X
Main Treatment (Clarify)	60 days		Clarifier #1	16	NA							X		X	X		X	X	X
			Clarifier #2	16	NA							X		X	X		X	X	X
			Piping	16/116	NA	X	X	X	X	X		X		X	X		X		X
			Gravity Filter	16A	NA							X		X	X		X	X	X
		Idle	Grit Chamber	16	NA	X	NA	NA	NA	NA		X		X	X		X		X
			Storage Tank (TK-8)	61	NA	X	X	X	X	X		X		X	X		X		X
		Idle	RP Filter	61	NA	X						X		X			X		X
		M6	Pressure Filters	63	NA	X					X	X		X			X		X
		Idle	Pilot Ultrafiltration Units	61	NA	X					X	X		X			X		X
			TK-73	70	NA	X	X	X	X	X	X	X		X	X		X		X
			Centrifugal Ultrafilter	71	NA	X						X		X			X		X
Main Treatment (IX/RO)[2]	10 days	M9	IX vessels (Cu-Zn)	34B	NA	X					X	X		X			X		X
		M7	IX vessels (12) (Perchl)	16	NA	X					X	X		X			X		X
		M7	TK-9	62	NA	X					X	X		X	X		X		X
		M8	Primary RO[3] Unit	72	NA	X					X	X		X	X		X		X
Main Treatment (Filter)	30 days	M5	Microfilter	70A	NA	X					X	X		X			X		X
			Piping	70A	NA	X	NA	NA	NA	NA		X		X	X		X		X
			Solids storage Tank	70A	NA	X	X	X	X	X	X	X		X	X		X		X
			Cleaning Tanks	70A	NA	X	X	X	X	X	X	X		X			X		X
		M4	TK-71	70	NA	X	X	X	X	X	X	X		X	X		X		X
		M4	TK-72	70	NA	X	X	X	X	X	X	X		X	X		X		X
Main Treatment (Tanks)	20 days	*Idle*	Low-level solids storage tank	NA	50-002	X	X	X	X	X		X		X	X		X	X	X
		Idle	Underground tank	62	TA-50-077	X	X	X	X	X		X		X	X		X	X	X

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Table 8. Closure Actions and Estimated Durations for Transuranic RLW Treatment Units

TRU Category	Closure Duration Estimate [1]	Permit Application No.	Vessel /item description	Room # in 50-001	Other Buildings	Isolate Unit	Collect liquid &/or Solids Sample for Analysis Sample	Evacuate (Pump or Drain) Free Liquid and/or Solids	Route Removed Liquids/Solids to New RLWTF for Treatment	Decontaminate Unit (Wash, scabble)	Demolish/Remove secondary containment system components	Radiological Survey	Apply Fixative or Paint	Remove Treatment Unit or vessel and Associated Structural Components	Size Reduce/Segment Larger removed Tanks/Vessels if Required	Complete Structural Assessments [1]	Demolish and Remove Structure(s) [1]	Collect Subgrade Soil Sample(s) [1] After Removal of Structure/Unit	Package/Ship Off-Site for Processing (e.g., Solidification) or Disposal Off-Site [1]	Route Drummed Solidified Waste Forms To TA-54 At LANL For Off-Site Transport and Disposal [1]
TRU Collection System		T1	TRU Collection system	NA	TA-50, TA-55, 50-201	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRU Influent Storage	60 days	T2	Acid Waste Tank	NA	50-066, 50-107	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		T2	Caustic waste tank	NA	50-066, 50-107	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		T2	Piping	NA	50-066, 50-107	X	X	X	X	X		X		X		X	X		X	
		T2	Valves	NA	50-066, 50-107	X	X	X	X	X		X		X		X	X		X	
		T3	TK-1	60	NA	X	X	X	X	X	X	X	X	X		X	X	X	X	
		T3	TK-2	60	NA	X	X	X	X	X	X	X	X	X		X	X	X	X	
TRU Treatment	60 days	*Idle*	TK-4	60A	NA	X	X	X	X	X		X		X			X		X	
			TK-6	60A	NA	X	X	X	X	X		X		X		X	X		X	
			TK-73	70A	NA	X	X	X	X	X	X	X		X	X	X	X		X	
		Idle	TK-7	60A	NA	X	X	X	X	X	X	X	X	X		X	X	X	X	
			Pressure Filter	60	NA	X	X	X	X	X		X		X		X	X		X	
		Idle	Decant filter	60A	NA	X	X	X	X	X		X		X		X	X		X	
			Piping	60 & 70A	NA	X	X	X	X	X		X		X	X	X	X		X	
			Drum tumbler	60A	NA	X	X	X		X		X		X	X	X	X		X	X
TRU Solids	30 days	T4	TK-7A	60A	NA	X	X	X	X	X	X	X	X	X		X	X	X	X	
TRU Effluent	30 days	T5	TK-3	60	NA	X	X	X	X	X	X	X		X	X	X	X		X	

[1] The estimated durations shown in the second column do not include the time required for completing the activities listed in the last five columns (covered elsewhere). These durations assume steady, advanced funding for closure.

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Date: JUL 2 8 2016
Symbol: EPC-DO-16-182
LA-UR: 16-24550
Locates Action No.: N/A

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Discharge Plan DP-1132 Quarterly Report, Second Quarter 2016, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the second quarter 2016 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the second quarter of 2016, no effluent was discharged to either National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at TA-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells
Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial wells MCO-6 and MCO-7 during the second quarter of 2016. No sample was collected from alluvial well MCO-4B because there was insufficient water in the well for sampling. No sample was collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Samples from wells MCO-6 and MCO-7 were submitted to GEL Laboratories LLC for analysis. Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results
No final weekly composite (FWC) samples were collected during the second quarter of 2016 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the second quarter of 2016 because no effluent was discharged to Mortandad Canyon.

Please contact Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Anthony R. Grieggs, Group Leader
Environmental Compliance Programs Group
Los Alamos National Security, LLC

Sincerely,

Karen E. Armijo
Permitting and Compliance Manager
National Security Missions
NNSA/Los Alamos Field Office

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Table 1.0. Mortandad Canyon Alluvial Well Sampling, 2nd Quarter 2016.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B	F	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-6	F	5/13/2016	3.9	0.59	0.45	0.06	281	1.0
MCO-7	F	5/13/2016	6.7	0.64	0.05	0.06	323	0.94
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

<u>Notes:</u>

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

[5]Dry means there was not sufficient water for sampling.

J flag indicates an estimated value.

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Date: OCT 19 2016
Symbol: EPC-DO-16-287
LA-UR: 16-27384
Locates Action No.: N/A

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hunter:

Subject: Discharge Plan DP-1132 Quarterly Report, Third Quarter 2016, TA-50 Radioactive Liquid Waste Treatment Facility

This letter from the U.S. Department of Energy and Los Alamos National Security, LLC (DOE/LANS) is the third quarter 2016 Discharge Plan DP-1132 report for the Technical Area (TA)-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Since the first quarter of 1999, DOE/LANS have provided the New Mexico Environment Department (NMED) with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

During the third quarter of 2016, no effluent was discharged to either National Pollutant Discharge Elimination System (NPDES) Outfall 051 or to the solar evaporative tank system (SET) at TA-52; all effluent was evaporated on-site at the mechanical evaporator system (MES).

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells

Table 1.0 presents the analytical results from sampling conducted at Mortandad Canyon alluvial wells MCO-6 and MCO-7 during the third quarter of 2016. No sample was collected from alluvial well MCO-4B because there was insufficient water in the well for sampling. No sample was collected from alluvial well MCO-3 because the well was damaged beyond repair during a flood event in September 2013. Samples from wells MCO-6 and MCO-7 were submitted to GEL Laboratories LLC for analysis. Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Intellus New Mexico environmental monitoring data web site (http://www.intellusnmdata.com).

TA-50 RLWTF Effluent Monitoring Results

No final weekly composite (FWC) samples were collected during the third quarter of 2016 because no effluent was discharged to Mortandad Canyon.

No final monthly composite (FMC) samples were collected during the third quarter of 2016 because no effluent was discharged to Mortandad Canyon.

Please contact Karen E. Armijo by telephone at (505) 665-7314 or by email at Karen.Armijo@nnsa.doe.gov, or Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this report.

Sincerely,

Anthony R. Grieggs
Group Leader
Environmental Compliance Programs
Los Alamos National Security, LLC

Sincerely,

Karen E. Armijo
Permitting and Compliance Program Manager
National Nuclear Security Administration
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Table 1.0. Mortandad Canyon Alluvial Well Sampling, 3rd Quarter 2016.

Sampling Location	Sample Field Prep (F/UF)[1]	Sample Date	Perchlorate (µg/L)	NO_3+NO_2-N (mg/L)	TKN (mg/L)	NH3-N (mg/L)	TDS (mg/L)	F (mg/L)
MCO-3		Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]	Damaged[4]
MCO-4B	F	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]	Dry[5]
MCO-6	F	7/28/2016	4.58	0.78	0.0345J	0.07	331	0.86
MCO-7	F	7/28/2016	7.55	1.1	0.10U	0.08	310	0.90
MCO-7 duplicate sample	F	7/28/2016	7.61	0.73		0.12	306	0.93
MCO-7 duplicate sample	UF	7/28/2016			0.1U			
NM WQCC 3103 Groundwater Standards			*NA* [2]	*10 mg/L* [3]	*NA* [2]	*NA* [2]	*1000 mg/L*	*1.6 mg/L*

Notes:

[1]F means the sample was filtered. UF means the sampled was not filtered.

[2]NA means that there is no NM WQCC 3103 standard for this analyte.

[3]The NM WQCC 3103 Groundwater Standard is for NO_3-N.

[4]Damaged means that the well was damaged beyond repair during a flood event in Mortandad Canyon in September 2013.

[5]Dry means there was not sufficient water for sampling.

J flag indicates an estimated value.

U flag means the result was less than the analytical laboratory's Method Detection Limit (MDL).