September 29, 1995

Mr. Moe A. Pasha
Manager of Engineering Services
Western Nuclear, Inc.
200 Union Blvd.
Suite 300
Lakewood, CO 80228

RE: Prior Reclamation Release, Ruby 1, 2, 3 and 4 Mines, McKinley County, New Mexico

Dear Mr. Pasha:

The Mining and Minerals Division (MMD) has completed the inspection of reclamation measures at Western Nuclear, Inc.'s Ruby 1, 2, 3 and 4 Mines. Based on findings in the enclosed inspection reports, reclamation measures at the Ruby 1, 2, 3 and 4 Mines satisfy the requirements of the New Mexico Mining Act (NMMA) and the substantive requirements for reclamation pursuant to the NMMA Rules. Therefore, Western Nuclear, Inc. is hereby released from further requirements of the NMMA on the Ruby 1, 2, 3 and 4 Mines. The enclosed prior reclamation inspection report details the findings of the inspection but does not include the photos/slides contained in the MMD file copy.

MMD appreciates Western Nuclear, Inc.'s efforts to comply with the NMMA and commends them for their safeguarding and reclamation efforts. If you have any questions please contact Holland Shepherd of the Mining Act Bureau, (505) 827-5971.

Sincerely,

Dr. Kathleen A. Garland, Director
Mining and Minerals Division

cc. Maxine Goad, Environment Department
Navajo Nation

Enclosure

PRIOR RECLAMATION INSPECTION REPORT AND RECOMMENDATION FOR RELEASE OR PERMIT REQUIREMENT

Western Nuclear, Inc.
Ruby 1, 2, 3 and 4 Mines

Submitted in Partial Fulfillment of New Mexico Mining Act
Section 69-36-7 U, Prior Reclamation

New Mexico Energy, Minerals and Natural Resources Department
Mining and Minerals Division
Mining Act Reclamation Bureau

September 29, 1995

Introduction

The purpose of this study was to determine if reclamation measures at Western Nuclear, Inc.'s Ruby 1, 2, 3 and 4 Mines satisfy requirements of the New Mexico Mining Act and the substantive requirements for reclamation pursuant to the New Mexico Mining Act Rules.

Ruby 1, 2, 3 and 4 Mine prior reclamation sites are located in Sections 21, 27, 25 and 26 T15N R13W, respectively. The mines are in the Smith Lake area of McKinley County, approximately 8 miles north of the City of Thoreau, New Mexico. The site is delineated in Figure 1. The mines are contiguous to each other and are, therefore, considered one site. Uranium ore was mined by underground methods from all four mines. However, only Ruby 1 and 3 Mines had access to the surface via inclined shafts. Ore from Ruby 2 and 4 mines was transported to the surface through Ruby 1 and 3 Mines, respectively. Consequently, there was no surface disturbance on Ruby 2 and 4 Mines other than ventilation shafts. Ruby 1 and 3 Mines comprise approximately 10 acres of disturbed area each (Peets, 1995).

Table I lists the owner of the surface and mineral rights of each section. The location of each Section is shown in Figure 1. The layout of the Ruby 1 Mine is given in Figure 2. Ruby 3 Mine is delineated in Figure 3.

A summary of the operating and reclamation dates is in Table II. Reclamation efforts at the Ruby mines were started June 1985 and completed December 1985. The power lines were turned over to the Navajo Power Company who salvaged and removed the line in the fall of 1987. Water systems were given to the Navajo Water Company. The Ruby 1 Mine Shaft was sealed with a concrete wall and backfilled. The Ruby 3 Inclined Shaft was closed and covered. No milling took place at this site. All ore was shipped offsite for milling and processing. However, some spoil in the waste pile at Ruby 1 Mine was radioactive enough that the Nuclear Regulatory Commission required special precautions taken upon mine closure. Spoils were covered with at least 10 feet of compacted fill. All buildings were removed except the shop building at Ruby 1 which was left at the request of the allottee. Ventholes were filled and sealed with concrete. Table III shows the seed mix used (Western, 1995). Rills that had formed at Ruby 1 Mine were repaired in 1993 (Pasha, 1995).

There is no surface water near the Ruby mines. All streams in the area are ephemeral.

TABLE I
Owners of Surface and Mineral Rights (Pasha, 1995)

Mine	Surface Rights	Mineral Rights
Ruby 1 Mine (Section 21 T15N R13W)	Indian Trust (Ms. Evelyn Charlie, Resident)	New Mexico and Arizona Land Co.
Ruby 2 Mine (Section 27 T15N R13W)	Indian Trust	New Mexico and Arizona Land Co.
Ruby 3 Mine (Section 25 T15N R13W)	Indian Trust (Ms. Mary Cayidotto, Resident)	Quipu Corporation
Ruby 4 Mine (Section 26 T15N R13W)	Indian Allotment # 11-49	Navajo Nation

Appendix A

Photo Documentation

GRID SURVEY

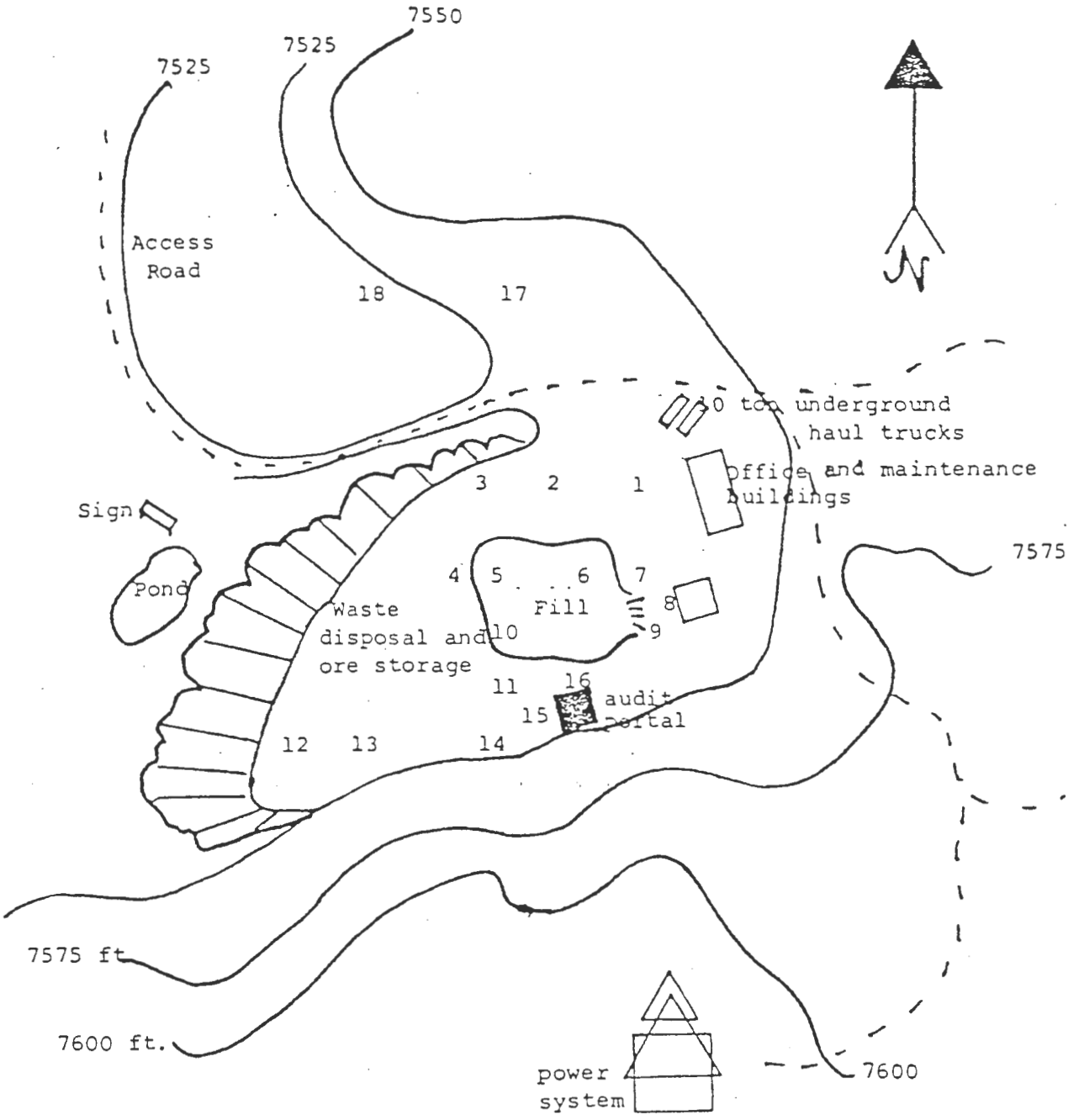


Figure 2 Layout of Ruby 1 Mine

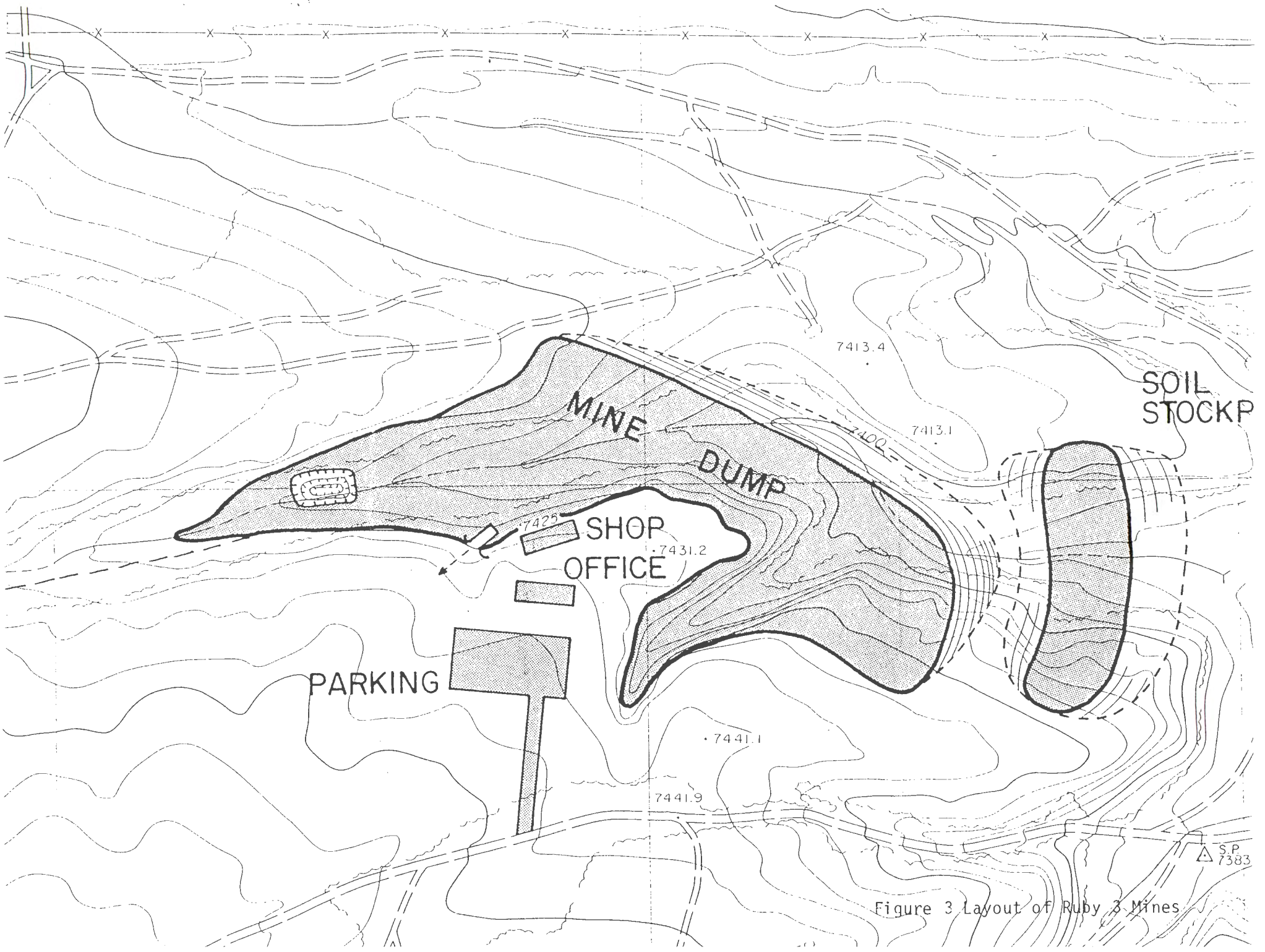


Figure 3 Layout of Ruby 3 Mines

TABLE II
Ruby 1, 2, 3 and 4 Mines Operating and Reclamation Dates (Western, 1995)

Mine	Mining Started	Mining Ended	Reseeded
Ruby 1 Mine (Section 21)	9/75	9/81	10/85
Ruby 2 Mine (Section 27)	4/79	11/81	10/85 (Vent Holes Only, No Portal)
Ruby 3 Mine (Section 25)	12/80	2/85	10/85
Ruby 4 Mine (Section 26)	5/82	2/85	10/85 (Vent Holes Only, No Portal)

TABLE III
Reclamation Seed Mix

Common Name	Percent Live Pure Seed
Alkali Sacaton	0.77
Weeping Lovegrass	0.78
Blue Grama	7.30
Indain Ricegrass	9.38
Yellow Sweetclover	13.68
Western Wheatgrass	16.76
Sideoats Grama	36.20

Inspection Procedures

Prior reclamation at Western Nuclear's Ruby Mines was inspected September 27, 1995. Mr. Moe A. Pasha, Manager of Engineering Services and Mr. Robert G. Peets, Mining Engineer and Geologist-Retired represented Western Nuclear, Inc. Mr. Holland Shepherd, Mining Act Reclamation Bureau Chief and Mr. Robert Young, Environmental Engineer represented the New Mexico Mining and Minerals Division. The inspection consisted of inspection of the general condition of the reclaimed mine site, discussion with the operator of mining and reclamation operations performed at site, line-intercept measurements and photo documentation of vegetative cover and diversity.

Inspections of each mine site consisted of a review of information submitted by the mine operator, subsequent discussion with the operator pertaining to mining and reclamation at each site, inspection of the condition of the reclaimed mine sites, line-intercept sampling for estimates of vegetative cover, compilation of plant species lists, measurement of reclaimed soil depths, and photo-documentation.

Each of the mine sites were visually inspected for erosion features and hydrologic stability. During a walkover of each site, all slopes, areas of water concentration (ponds, diversions and areas where disturbed areas enter undisturbed lands) were visually inspected for stability. Topsoil placement and distribution also was evaluated at each site. Sampling for topsoil depth consisted of randomly digging a series of holes to identify the depth of topsoil and the presence or absence of potentially toxic wasterock at rooting depth. Grading of all wasterock piles and borrow areas was visually inspected. Placement and closure of portals and vent shafts was verified in the field.

The establishment and relative percent cover of reseeded and native plant species were evaluated in randomly placed transects. Fifty foot transects were evaluated at each mine site using the line intercept method (Bonham 1989). These transects were used to estimate the relative percent cover of each plant species intercepted at 3' intervals along a transect. A total of 17 points per transect were recorded. In addition, a list of species present within a 50' X 6' belt transect adjacent to each transect was compiled. These sampling procedures, however, do not meet sample adequacy. Rather, these procedures were conducted to estimate the relative percent cover and to evaluate the diversity of species present at each of the eight mine sites. Additional resources would be needed to fully evaluate the vegetation of these prior reclamation sites to a level of sample adequacy and would require at least 24 additional man-hours of inspection time per site.

Results and Discussion

Both declines had been sealed at the surface and there were no residual features revealing their locations. The locations of the declines were only inferred from mounds in the vicinity of each portal left to accommodate settlement.

All structures, trash and junk had been removed at both Ruby 1 and Ruby 3, except at the Ruby 1 Mine where various items, such as tin cans, buckets, towels, etc., were hanging from trees around the site. Navajo Indians in the area hung these to keep spirits out (Peets, 1995). Also, at the Ruby 3, the concrete foundation from the mine's warehouse remained. Apparently, the operator sold the building to the Navajo surface owner for one dollar. The new owner removed and sold the structure and left the foundation.

No piles or accumulations of toxic or waste material were observed. There were no apparent hazards that could effect public health or safety. A report signed by Steve Carey of the New Mexico Environmental Improvement

No piles or accumulations of toxic or waste material were observed. There were no apparent hazards that could affect public health or safety. A report signed by Steve Carey of the New Mexico Environmental Improvement Division, dated August 29, 1986 indicates that hazards have been minimized by the reclamation performed by the operator (see Appendix C).

All slopes appeared stable with respect to erosion and mass movement. The waste rock piles had been regraded to a topography that blended in well with the surrounding terrain.

Vegetation at both sites has become well established. However, vegetation at the Ruby 1 is being heavily impacted by over grazing. Plants have been cropped off to the ground and in places have been replaced by weeds (Kochia). Photos documenting vegetation and general condition of the site are in Appendix A.

There was a clear water diversion at Ruby 3 Mine incised in bedrock. Hydrologically Ruby 3 is stable.

At the Ruby 1moderate rill formation has developed in spots. Erosion appears to be grazing induced. Rills at Ruby 1 Mine had been repaired with limestone cobble. The operator committed to repairing the remaining rills by the end of November 95.

The reclaimed and surrounding areas, at both sites showed signs of drought stress and heavy grazing by sheep, goats, cattle, horses and wildlife. Vegetation cover averaged 35 percent. Diversity was moderate. Ten non-weedy perrennial species of plants were identified on site (Young, 1995). Vegetation measurements are in Appendix B.

Conclusions and Recommendations

The Mining and Minerals Division commends Western Nuclear, Inc. for their efforts to comply with the New Mexico Mining Act. Further reclamation measures are not required at Western Nuclear, Inc.'s Ruby 1, 2, 3 and 4 Mines to satisfy the requirements of the New Mexico Mining Act other than rill repair at the Ruby 1 Mine. It is staff's conclusion that these sites meet the environmental conditions that allow for the reestablishment of a 'self-sustaining ecosystem' as defined in Rule 1 and put forth in Rule 5.7A of the New Mexico Mining Act. It is recommended, therefore, that the Ruby 1, 2, 3 and 4 prior reclamation sites, operated by the Western Nuclear, Inc. be released from further requirements of the New Mexico Mining Act contingent on repairs of the mentioned erosion features by November 30, 1995.

References

Pasha, Moe A. 1995, Manager of Engineering Services, Western Nuclear, Inc., Personal Communication.

Peets, Robert G. 1995, Mining Engineer and Geologist-Retired, Western Nuclear, Inc., Personal Communication.

Western 1994, Western Nuclear, Inc.'s Prior Reclamation Inspection Request for the Ruby 1, 2, 3 and 4 Mines.

Young, Robert 1995, Environmental Engineer, Mining and Minerals Division, Field Notes.

Ruby 1 Mine Reclaimed Waste Rock Pile

Ruby 1 Reclaimed Waste Rock Pile

Ruby 1 Reclaimed Waste Rock Pile

Ruby 1 Mine Erosion Feature

Ruby 1 Mine Repaired Erosion Features

Ruby 1 Mine Repaired Erosion Features

Ruby 1 Mine Concrete Slab left at request of land owner

Ruby 1 Mine Concrete Slab left at request of Land Owner

Ruby 1 Mine Oil Cans Hanging in Trees

Ruby 1 Mine Towel Hanging in Trees

Ruby 1 Mine Inclined Shaft Portal Site (Note Washtub hanging in Tree)

Ruby 3 Mine Reclaimed Waste Rock Pile

Ruby 3 Mine Reclaimed Waste Rock Pile

Ruby 3 Mine Reclaimed Waste Rock Pile

Ruby 3 Mine Road developed by Land Owner

Ruby 3 Mine Inclined Shaft Portal Site

Ruby 3 Mine East Clearwater Diversion

Ruby 3 Mine West Clear Water Diversion

Ruby 3 Mine West Clear Water Diversion

Ruby 3 Mine West Clear Water Diversion and Impoundment

Ruby 3 Mine Shop Site

Appendix B

Vegetation Documentation

Table 1. List of Species Identified at the Ruby 1 and 3 Mines

COMMON NAME	*Genus & species*[1]
Sand dropseed	*Sporobolus cryptandrus*
Western wheatgrass	*Agropyron smithii*
Crested wheatgrass	*Agropyron cristatum*
Side oats grama	*Bouteloua curtipendula*
Bluse grama	*Bouteoua gracilis*
Kochia	*Kochia scoparium*
Threadleaf groundsel	*Senecia douglasii*
Snake weed	*Gutierrezia sarothre*
Sagebrush	*Artemesia tridentata*
Purple aster	*Aster bigelovii*
Rabbitbrush	*Chrysothamnus nauseosus*

1 Nomenclature after: Martin, W. C. and C. R. Hutchins. 1980. **A Flora of New Mexico**. J. Cramer, Vaduz, Germany. Welsh, S.L. *et al.* 1987. **A Utah Flora**. Great Basin Naturalist Memoir No. 9.

Table 2. Summary of Relative Cover Data at the Ruby 3 .

Transect #1	**Value (%)**
Perennial Cover:	41
Litter Cover	18
Rock Cover	0
Bare Ground	35
Number of perennial species present in belt transect	2

Transect #2	**Value (%)**
Perennial Cover:	18
Litter Cover	24
Rock Cover	0
Bare Ground	53

Number of perennial species present in belt transect	2

Table 3 Summary of Relative Cover Data at the Ruby 1.

Transect #1	**Value (%)**
Perennial Cover:	41
Litter Cover	6
Rock Cover	0
Bare Ground	47
Number of perennial species present in belt transect	4

Transect #2	**Value (%)**
Perennial Cover:	18
Litter Cover	24
Rock Cover	0
Bare Ground	53
Number of perennial species present in belt transect	2

Appendix C

Environmental Improvement Division Report

TE OF NEW MEXICO
NVIRONMENTAL
MPROVEMENT
IVISION

TONEY ANAYA
GOVERNOR

DENISE D. FORT
DIRECTOR

August 29, 1986

Western Nuclear, Inc.
Environmental Division
134 Union Blvd
Lakewood, CO 80215

Dear Sir,

I am enclosing a copy of the Site Inspection report describing the conditions at the site of the Section 21 uranium mine formerly operated by Western Nuclear ,Inc. Based on our investigations, we are recommending no further action at this time.

Please feel free to contact me in writing or at (505) 827-2898 with any inquires or comments you have concerning this transmittal.

Yours truly,

Richard A Rawlings

for Steven Cary, Acting Manager
CERCLA Program

SITE INSPECTION SUMMATION

Further action under the CERCLA Program at the Western Nuclear Mine site is not considered necessary. Any immediate threat to health, welfare and the environment has been dealt with and a preliminary ranking of the site on the Hazardous Ranking System indicates that the site would only score in the 16 - 17 range. The Navajo Nation Environmental Protection Administration is aware of the situation at this site and has the technical expertise and authority to monitor and to ensure that current conditions are maintained.

The immediate impact of the contaminated material on the health and welfare of the near-by residents and the local environment has been mininized by the remedial action that was performed by the company. The mine adit was closed and the waste pile was graded to more natural contours before being covered with approximately 12 inches of topsoil and then planted with grass seed. Although the grasses are developing well in this first growing season some erosion gullies have formed. Maintenance of the cover material while the vegetation becomes established would minimize the erosion problem. The company donated the only building remaining on-site to a nearby resident. Plans to move this building are being supervised by the Navajo Nation EPA.

Additional reasons for proposing no further action at this site are:

Depth to ground water is about 400 feet and local use is limited to stock watering. The Smith Lake Community Water Supply System supplies drinking water to residences in the area;

Cover soil effectively reduces the amount of radon gas being released;

Streams in the area are intermittent and have no specific use;

No population center is within 3 miles. Population within a 3 mile radius is probably less than 1000 and is grouped in small clusters of 2 to 5 houses.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by Hq)
VI	NM01911

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Tack Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET (or other identifier)		
Western Nuclear Mine	4½ miles west on Navajo Route 49 from (cont'd S Attachment		
C. CITY	**D. STATE**	**E. ZIP CODE**	**F. COUNTY NAME**
Smith Lake	NM	86515	McKinley

G. SITE OPERATOR INFORMATION

1. NAME	2. TELEPHONE NUMBER		
Western Nuclear, Inc.	(303) 986-4571		
3. STREET	**4. CITY**	**5. STATE**	**6. ZIP CODE**
134 Union Blvd	Lakewood	CO	80215

H. REALTY OWNER INFORMATION (if different from operator or site)

1. NAME	2. TELEPHONE NUMBER	
The Navajo Nation, Window Rock, AZ Contact: Levon Benally, Division of Resources	(602) 871-6534	
3. CITY	**4. STATE**	**5. ZIP CODE**
Window Rock, Arizona	AZ	86515

I. SITE DESCRIPTION
A uranium mine waste pile containing both mine spoil and ore was covered with top soil in mid 1985. ~~Runoff from the pile~~ (Cont'd See Attachment A)

J. TYPE OF OWNERSHIP
[XX] 1. FEDERAL [ ] 2. STATE [ ] 3. COUNTY [ ] 4. MUNICIPAL [ ] 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.)	B. APPARENT SERIOUSNESS OF PROBLEM
	[ ] 1. HIGH [ ] 2. MEDIUM [X] 3. LOW [ ] 4. NONE

C. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE (mo., day, & yr.)
Richard A.Rawlings	(505) 827-2911	August 13, 1986

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME	2. TITLE	
Steven J. Cary	Acting Manager, MSCA-PA/SI Program	
3. ORGANIZATION	**4. TELEPHONE NO. (area code & no.)**	
NM Envir.Improvement Division, Ground Water/Hazardous Waste Bur.	(505 827-2898	

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Richard A.Rawlings	NMEID, GW/Haz.Waste Bureau	(505) 827-2911
Bobby Lopez	NMEID, Milan Field Office	(505) 287-8845

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Levon Benally	Envir. Specialist (602) 871-6534	Navajo Nation, Division of Resources P.O.Box 308, Window Rock, AZ 86515
Gene Little	As Above	As Above
Vernon Tsosie	(602) 729-5281	As Above
Carol Boughton	Hydrologist (602) 729-5281	As Above

Continued From Front

III. INSPECTION INFORMATION *(continued)*

D. GENERATOR INFORMATION *(sources of waste)*

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Western Nuclear, Inc.	(303) 986-4571	134 Union Blvd, Lakewood, Co 80215	Uranium Mine Spoils

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION *(mo., day, & yr.)*	H. TIME OF INSPECTION	I. ACCESS GAINED BY: *(credentials must be shown in all cases)*
July 10, 1986	0915 - 1156	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER *(describe)*

Fine, warm and sunny. 60 - 70 degrees Fahreneit

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN *(mark 'X')*	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER	X		
b. SURFACE WATER	X	Scientific Laboratory Division	
c. WASTE	X	Health and Envir. Dept., 700 Camino de Salud, NE Albuquerque, NM 87106	August 8, 1986
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL	X		
h. VEGETATION			
i. OTHER *(specify)*			

B. FIELD MEASUREMENTS TAKEN *(e.g., radioactivity, explosivity, PH, etc.)*

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL

2. PHOTOS IN CUSTODY OF: Attached

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: A copy of USGS topographical map is attached.

E. COORDINATES

1. LATITUDE (deg.-min.-sec.): 35 - 31 - 15 N

2. LONGITUDE (deg.-min.-sec.): 108 - 13 - 30 W

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE (Those inductrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

[X] 2. INACTIVE (Those sites which no longer receive wastes.)

[ ] 3. OTHER (specify): _____ (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES (specify generator's four-digit SIC Code): 1094

C. AREA OF SITE (in acres): Approx 15 acres

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES (specify): A metal maintenance building on-site

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

A. TRANSPORTER	B. STORER	C. TREATER	D. DISPOSER
	X 1. PILE		
			X Pile

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [X] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[ ] 9. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

NO

Continue On Reverse

Continued From Front

VII. WASTE RELATED INFORMATION (continued)

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT: Approx. 200,000	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE: cu. yards	UNIT OF MEASURE
X (1) PAINT, PIGMENTS	X (1) OILY WASTES	X (1) HALOGENATED SOLVENTS	X (1) ACIDS	X (1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(2) METALS SLUDGES	(2) OTHER(specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER(specify):	(3) CAUSTICS	X (3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(5) OTHER(specify):			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER(specify):
			(6) CYANIDE	(6) OTHER(specify):	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER(specify):		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Uranium	X			X				--------	Unkown	
Lead - 210	X			X				--------	"	
Radium - 226	X			X				--------	"	
Thorium - 230	X			X				--------	"	

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[X] A. HUMAN HEALTH HAZARDS

Area is unsecured and readily accessible. Several residences are within ½ mile, however the area is generally sparsely populated.

Continued From Page 4

VIII. HAZARD DESCRIPTION *(continued)*

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☒ E. CONTAMINATION OF FOOD CHAIN

Sheep graze the area. Radioactive substances could be ingested by sheep either by eating the vegetation or drinking contaminated run-off water.

☒ F. CONTAMINATION OF GROUND WATER

Water from a windmill used to water stock showed significantly elevated levels of uranium, thorium and radium. Depth and construction of the well is unkown. The well may be drawing water from an aquifercontaining naturally occurring radioactive material.

☒ G. CONTAMINATION OF SURFACE WATER

Analyses of sediments suggest that contamination has not entered the arroyo which carries run-off water from the pile.

Continued From Front

VIII. HAZARD DESCRIPTION (continued)

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☒ J. CONTAMINATION OF AIR

The breakdown of radioactive material in the pile is no doubt releasing radon gas to the atmosphere. This will have been reduced by the 12 inches of cover soil that was applied to the pile. No monitoring was performed to verify this.

☐ K. NOTICEABLE ODORS

☒ L. CONTAMINATION OF SOIL

Some contamination of soil at the toe of the pile was shown.

☐ M. PROPERTY DAMAGE

Continue On Page 7

Continued From Page 6

VIII. HAZARD DESCRIPTION (continued)

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☒ Q. EROSION PROBLEMS

In mid 1985 the pile was graded and contoured to more natural slopes and the entire surface covered with approximately 12 inches of soil trucked in from outside. The site was then revegetated with a mixture of grasses. In July, 1986, the grass cover, although being grazed, was well developed. Several erosion gullies, 6 to 9 ins deep had developed exposing the waste material.

☒ R. INADEQUATE SECURITY

Area is unsecured. However it is in an isolated and sparsely populated area.

☐ S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION (continued)

☐ T. MIDNIGHT DUMPING

☐ U. OTHER (specify):

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	20 - 25	20 - 25	5 Residences	½ mile
2. IN COMMERCIAL OR INDUSTRIAL AREAS	0	0	0	½ mile
3. IN PUBLICLY TRAVELLED AREAS	20 veh./ day	20 veh./ day	0	½ mile
4. PUBLIC USE AREAS (parks, schools, etc.)	0	0	0	2 miles

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
Approx. 400 feet	To North-east	Stock watering/Drinking
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)**	**F. DIRECTION TO DRINKING WATER SUPPLY**
5 - 20 gallons/min	Smith Lake (5 miles)	East

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS* ☒ 2. COMMUNITY (specify town): > 15 CONNECTIONS ~~SMith Lake Community Supply System~~

☐ 3. SURFACE WATER ☒ 4. WELL

Continue On Page 9

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
None				

I. RECEIVING WATER

1. NAME: Puerco River

☐ 2. SEWERS ☒ 3. STREAMS/RIVERS ☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER (specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

Unclassified

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☒ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☒ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	X'	C. OTHER (specify below)
X	1. SAND				
X	2. CLAY		Mancos Shale Dakota Sandstone		
	3. GRAVEL		Morrison Formation		

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)

☐ D. MODERATE (10 to .1 cm/sec.) ☒ E. LOW (.1 to .001 cm/sec.) ☐ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☒ 1. YES ☐ 2. NO 3. COMMENTS: Recharge of superficial aquifers only; No recharge of the Morrison Formation, the main water supply aquifer, occurs.

H. DISCHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE: 20%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.: West. Some erosion of the cover soil has occurred.

J. OTHER GEOLOGICAL DATA

Continue On Reverse

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE *(e.g., RCRA, State, NPDES, etc.)*	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED *(mo., day, & yr.)*	E. EXPIRATION DATE *(mo., day, & yr.)*	F. IN COMPLIANCE *(mark 'X')*		
					1. YES	2. NO	3. UNKNOWN
None							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☒ NONE ☐ YES *(summarize in this space)*

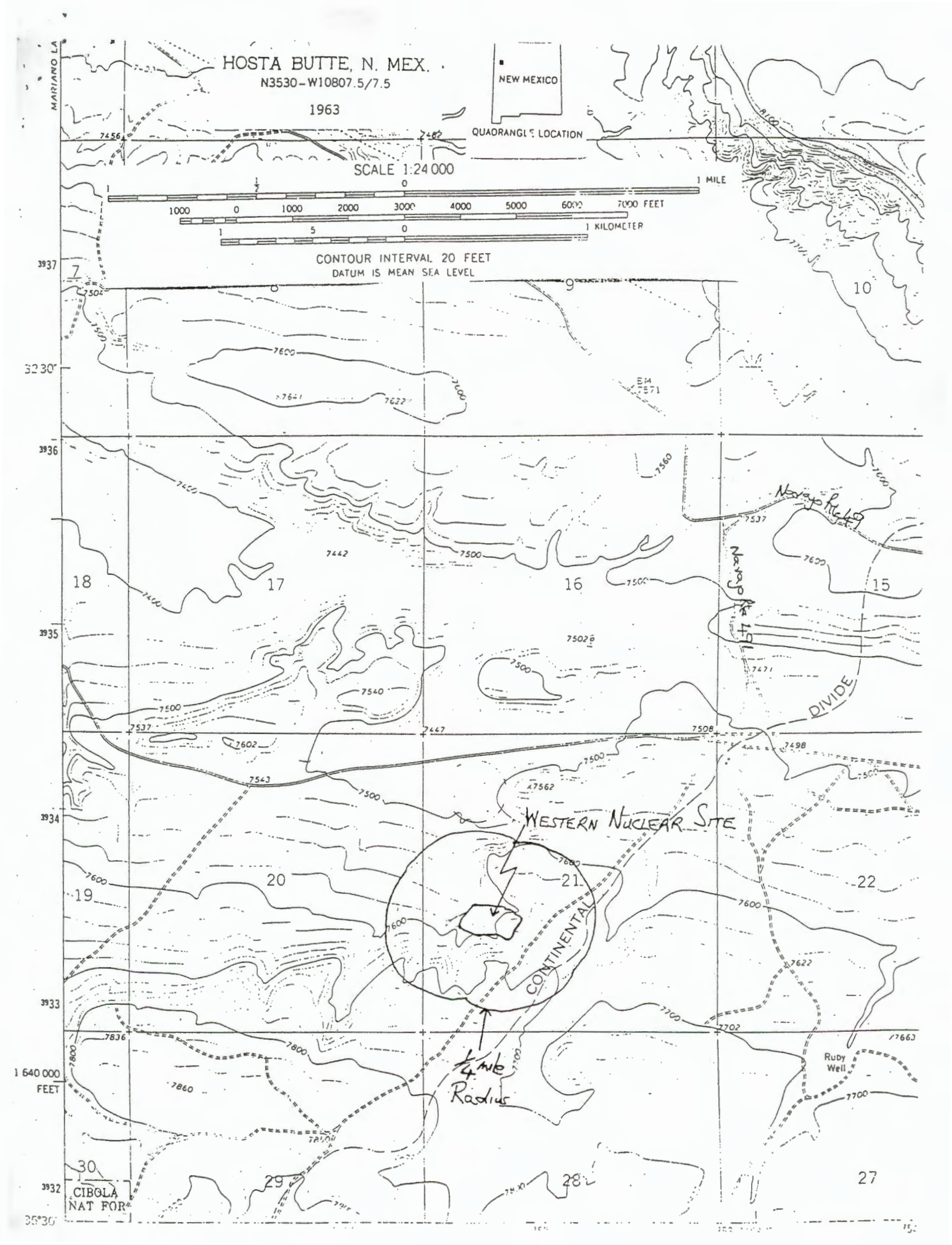
NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

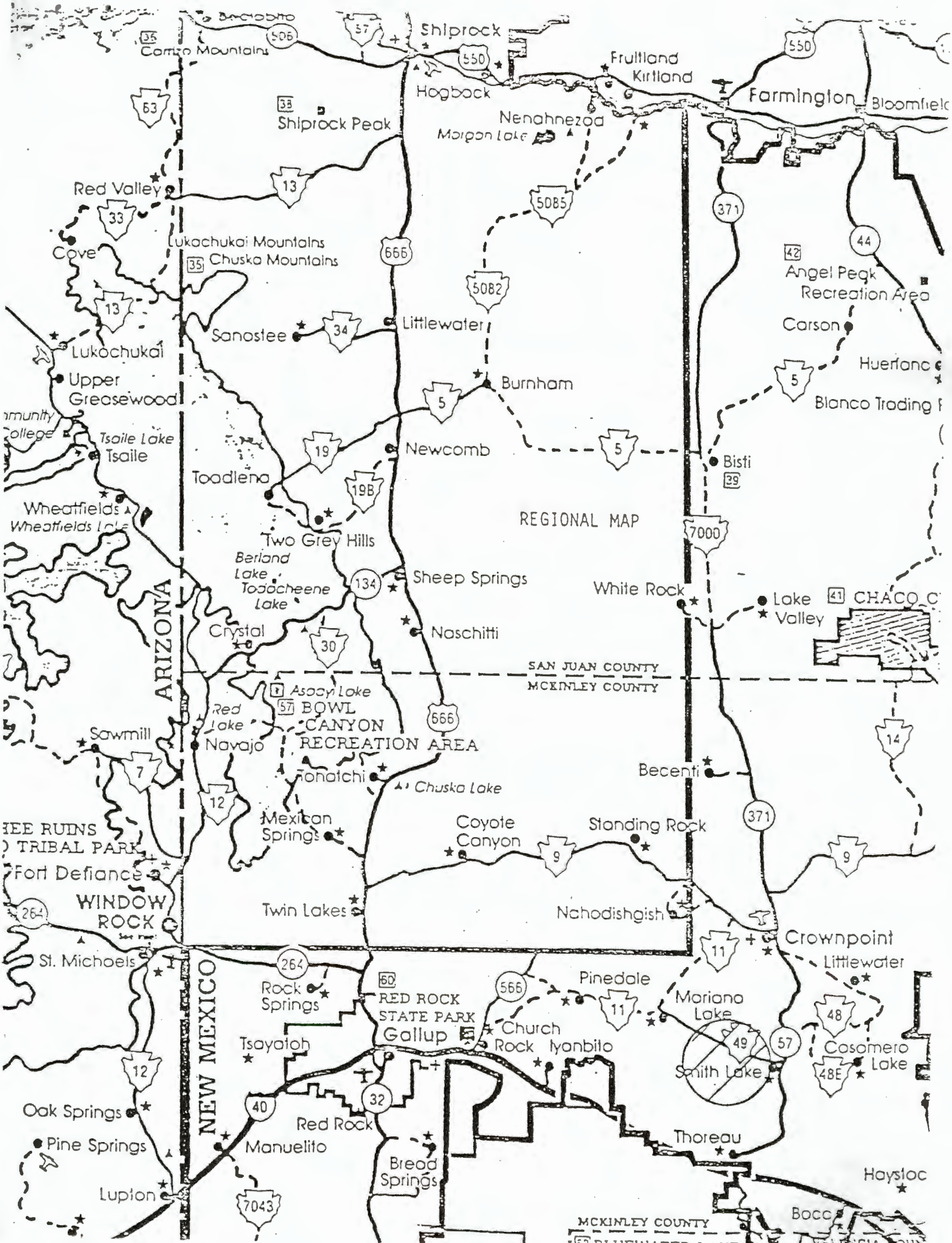
ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT SUPPLEMENT SHEET

Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070-3.

Corresponding number on form	Additional Remark and/or Explanation
Section 1.B. (cont'd)	the junction with State Route 57 at Smith Lake, then 1.6 miles south and west on Navajo Route 491, then 0.8 miles south on unmarked dirt road.
SEction 1.I.	enters an arroyo 50 yards from the toe of the pile. The pile contains approximately 200,000 cubic yards.


HOSTA BUTTE, N. MEX.
N3530–W10807.5/7.5
1963
NEW MEXICO
QUADRANGLE LOCATION
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
MARIANO LA
ALCO
Navajo Rte 49
DIVIDE
WESTERN NUCLEAR SITE
CONTINENTAL
¼ mile Radius
Rudy Well
CIBOLA NAT FOR
1 640 000 FEET
32 30'
35°30'


REGIONAL MAP
Shiprock
Carrizo Mountains
Fruitland
Kirtland
Farmington
Bloomfield
Hogback
Nenahnezad
Shiprock Peak
Red Valley
Lukachukai Mountains
Chuska Mountains
Cove
Angel Peak
Recreation Area
Carson
Huerfano
Sanostee
Littlewater
Lukachukai
Upper
Greasewood
Burnham
Blanco Trading
Tsaile Lake
Tsaile
Newcomb
Toadlena
Bisti
Wheatfields
Two Grey Hills
Berland
Lake
Toadcheene
Lake
Sheep Springs
White Rock
Lake
Valley
CHACO C
Crystal
Naschitti
ARIZONA
SAN JUAN COUNTY
MCKINLEY COUNTY
Asaayi Lake
BOWL
CANYON
RECREATION AREA
Red
Lake
Sawmill
Navajo
Tohatchi
Chuska Lake
Becenti
Mexican
Springs
Coyote
Canyon
Standing Rock
TRIBAL PARK
Fort Defiance
WINDOW
ROCK
Twin Lakes
Nahodishgish
Crownpoint
St. Michaels
Littlewater
Pinedale
Rock
Springs
RED ROCK
STATE PARK
Mariano
Lake
Gallup
Church
Rock
Iyanbito
Casamero
Lake
Tsayatoh
Smith Lake
NEW MEXICO
Oak Springs
Red Rock
Thoreau
Pine Springs
Manuelito
Bread
Springs
Haystac
Lupton
MCKINLEY COUNTY
BLUEWATER LAKE
506
57
550
63
13
33
5085
666
5082
371
44
34
5
19
19B
7000
134
30
14
7
12
9
264
11
48
49
48E
40
32
7043

WESTERN NUCLEAR, INC.

UNION PLAZA SUITE 300, 200 UNION BOULEVARD, LAKEWOOD, COLORADO 80228
TELECOPIER (303) 989-8993 TELEPHONE (303) 989-8675

September 11, 1995

SEP 11

Mr. Holland Shepherd
Chief, Mining Act Reclamation Bureau
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco
Santa Fe, New Mexico 87505

RE: Ruby 1 and 3 Mines

Dear Mr. Shepherd:

This letter is in response to your letter of July 12, 1995 concerning the above sites. For the reasons expressed in our previous correspondence with the Mining and Minerals Division, Western Nuclear, Inc. maintains that it is not responsible to obtain any permits or take any other actions pursuant to the New Mexico Mining Act with respect to these mines. Notwithstanding that position, and while reserving all legal rights and defenses, Western Nuclear, Inc. is willing to assist in making arrangements for the Mining Act Reclamation Bureau to inspect these mines under the ''prior reclamation'' provisions of the Act and the Rules. Enclosed is a check in the amount of $500.00 (check #79480115) to cover fees for the inspection.

Please contact Mr. Moe Pasha in the Western Nuclear offices in Denver at (303) 989-8675 to make arrangements for the inspection. Permission to obtain access to the site will have to be obtained from the surface owner, since Western Nuclear, Inc. does not currently have legal access. However, we will assist in making those arrangements, and would like to accompany you or your staff on the inspection. We understand that the inspection will be made before September 30, 1995.

Yours very truly,

Ken C. Bennett
Manager

KCB:sm
Enclosure

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

July 12, 1995

Mr. Michael Schern
Western Nuclear, Inc.
Union Plaza Suite 300
200 Union Boulevard
Lakewood, Colorado 80228

Re: Ruby 1 and Ruby 3 Mines Permitting vs Prior Reclamation Status, Western Nuclear, Inc., McKinely County

Dear Mr. Schern:

This letter is to follow-up on the Mining and Minerals Division's previous correspondence with Western Nuclear, Inc. (WNI) concerning the status, under the New Mexico Mining Act, of the Ruby 1 and the Ruby 3 mine sites. The Division is still considering these sites as ones which might need to meet the requirements of the New Mexico Mining Act. However, we would like to visit the sites prior to making any further decisions. Please advise us as to whether or not the site visits can be accommodated.

You mentioned in your previous correspondence that these sites have been reclaimed. We will of course be interested in how this was accomplished, what was on the site prior to reclamation and what the site looks like now. If there is any information you could provide us with prior to our inspection of the sites or during the site visit we would appreciate it. We are conducting our prior reclamation inspections this summer, so we are interested in any sites that may fall into this category.

Please contact me directly if you have any questions concerning this letter.

Sincerely,

Holland Shepherd
Bureau Chief
Mining Act Reclamation Bureau

VILLAGRA BUILDING - 408 Galisteo
Forestry and Resources Conservation Division
P.O. Box 1948 87504-1948
827-5830
Park and Recreation Division
P.O. Box 1147 87504-1147
827-7465

2040 South Pacheco
Office of the Secretary
827-5950
Administrative Services
827-5925
Energy Conservation & Management
827-5900
Mining and Minerals
827-5970
Oil Conservation
827-7131

VOUCHER NUMBER	INVOICE NUMBER	PURCHASE ORDER	INVOICE DATE	AMOUNT	DISCOUNT	NET AMOUNT
	Prior Reclamation Inspection Fee					
			TOTALS			

WESTERN NUCLEAR, INC.
PHOENIX, ARIZONA 85004

PLEASE DETACH BEFORE DEPOSITING

THE FACE OF THIS DOCUMENT HAS A COLORED BACKGROUND ON WHITE PAPER

794- 80115

WESTERN NUCLEAR, INC.
2000 N. CENTRAL
PHOENIX, ARIZONA 85004

62-26
311

252-09

DATE	CHECK NO.	NET AMOUNT
September 11, 1995	79480115	*** $ 500.00 ***

PAY
Five Hundred Dollars & 00/100 ***

TO THE ORDER OF New Mexico Mining and Minerals Division

OPERATING ACCOUNT

AUTHORIZED SIGNATURE

CHEMICAL BANK DELAWARE
1201 Market Street
Wilmington, Delaware 19801

Prior Reclamation Inspection Fee

THE BACK OF THIS DOCUMENT CONTAINS AN ARTIFICIAL WATERMARK - HOLD AT AN ANGLE TO VIEW

[redacted]

WESTERN NUCLEAR, INC.

UNION PLAZA SUITE 300, 200 UNION BOULEVARD, LAKEWOOD, COLORADO 80228
TELECOPIER (303) 989-8993 TELEPHONE (303) 989-8675

September 11, 1995

SEP 1 1

Mr. Holland Shepherd
Chief, Mining Act Reclamation Bureau
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco
Santa Fe, New Mexico 87505

RE: Ruby 1 and 3 Mines

Dear Mr. Shepherd:

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Yours very truly,

Ken C. Bennett

Ken C. Bennett
Manager

KCB:sm
Enclosure

Western Nuclear, Inc.

New Mexico - Ruby Mine Sites

Operation Dates Summary

Location	First Mining Started	Last Mining Ended	Reclaimed
Section 21			
Ruby 1 - portal	9/75	9/81	10/85
Section 27			
Ruby 2 - no portal (through Ruby 1)	4/79	11/81	10/85
Section 25			
Ruby 3 - portal	12/80	2/85	10/85
Section 26			
Ruby 4 - no portal (through Ruby 3)	5/82	2/85	10/85

- No milling took place at these sites. All ore was shipped offsite for milling and processing.

- Information from file records at WNI Lakewood Office-JR Gearhart/A.Root

State of New Mexico
ENER MINERALS and NATURAL RESOURC DEPARTMENT
Santa Fe, New Mexico 87505

New Mexico DRUG FREE It's a State of Mind!

July 12, 1995

Mr. Michael Schern
Western Nuclear, Inc.
Union Plaza Suite 300
200 Union Boulevard
Lakewood, Colorado 80228

Re: Ruby 1 and Ruby 3 Mines Permitting vs Prior Reclamation Status, Western Nuclear, Inc., McKinely County

Dear Mr. Schern:

This letter is to follow-up on the Mining and Minerals Division's previous correspondence with Western Nuclear, Inc. (WNI) concerning the status, under the New Mexico Mining Act, of the Ruby 1 and the Ruby 3 mine sites. The Division is still considering these sites as ones which might need to meet the requirements of the New Mexico Mining Act. However, we would like to visit the sites prior to making any further decisions. Please advise us as to whether or not the site visits can be accommodated.

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Please contact me directly if you have any questions concerning this letter.

Sincerely,

Holland Shepherd
Bureau Chief
Mining Act Reclamation Bureau

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827-7131

WESTERN NUCLEAR, INC.

UNION PLAZA SUITE 300, 200 UNION BOULEVARD, LAKEWOOD, COLORADO 80228
TELECOPIER (303) 989-8993 TELEPHONE (303) 989-8675

December 19, 1994

Mr. Holland Shepherd
Bureau Chief
Mining Act Reclamation Bureau
Energy, Minerals & Natural Resources Department
Santa Fe, New Mexico 87505

Re: Site Status of the Ruby 1 (Section 21) and Ruby 3 Mines (Section 25)

Dear Mr. Shepherd:

This letter is in reply to your letter of October 27, 1994. We have conducted further research regarding the details of the subject mines in order to respond to the questions posed in your letter. It should be noted that, since the mineral interest under these Sections was owned by private parties, not Indians or the federal government, it does not appear that federal agencies played any part in approving or supervising either the planning, mining or reclamation of these operations. The following responses correspond to the numbered questions in your October 27, 1994 letter:

1. The land upon which these sites are located is Tribal Trust Land. We understand that there may be a difference of opinion between the State of New Mexico and the Navajo Tribe regarding whether Tribal Trust Lands are part of the Reservation.

2. Because Western Nuclear has no current legal interest in these mines, we do not maintain up-to-date records regarding legal status. To the best of our knowledge, the current owner of the mineral estate under Section 21 is the New Mexico and Arizona Land Company. With respect to Section 25, to the best of our knowledge, the current owner of the uranium bearing ores, and minerals contained in and associated with uranium bearing ores and other minerals or materials occurring in association with uranium ores, is Quipu Corporation. To the best of our knowledge, all other minerals are owned by New Mexico and Arizona Land Company. Western Nuclear, Inc. does not hold any interest in any of these properties. Western Nuclear has no ownership, lease or claim interest in either the surface or mineral estate on these lands, and has no legal right of access.

3. Western Nuclear did not hold any lease on these lands with the Navajo Tribe. Because the Navajo Tribe owns only the surface and does not own the mineral estate, it does not appear that the BIA's reclamation regulations are legally applicable, pursuant to 25 C.F.R. §216.2(b).

4. It appears that the BLM's involvement was in approving reclamation of Section 26 (Indian Allotted Land), which was mined through a portal on Section 25. BLM stated in a letter dated November 20, 1985, in part:

> An inspection of the Section 26 Mine (NOO-C-14-20-4598, 4599, and 4902) was conducted October 25, 1985, and it was found that all reclamation work has been satisfactorily completed.

It does not appear that BLM had any involvement in approving reclamation of Section 21.

In addition to responding to the specific questions posed in your October 27, 1994 letter, we would like to respond to the statement in the letter that "[i]t is our interpretation of the Act that not being the current operator/owner would not exonerate WNI from having to permit the operations, if the operations are considered existing and WNI was responsible for operation of the sites during the time frame defined for and [sic] existing mine operation." We do not believe that the Mining Act imposes liability upon the former owner or operator of an "existing mining operation" who has abandoned all interest in the mine. Furthermore, the requirements of the Mining Act Rules would make it impossible for Western Nuclear to obtain a permit for these mines.

The definition of "existing mining operations" quoted in your October 27, 1994 letter simply classifies a mine as "existing" versus a "new mining operation." It does not make any reference to "owner" or "operator," and does not attempt to define who is responsible to meet the requirements of the Act. We believe that the primary purpose of the definition of "existing mining operation" is to distinguish between the "existing" and "new" classes of operations so that, for example, a mine that was operating in the past but that does not meet the definition of "existing mining operation" must obtain a permit as a "new mining operation" before reopening.

Aside from the definition of "existing mining operation," there is no provision in the Mining Act that suggests that anyone other than the current owner or operator of an "existing mining operation" has any responsibility under the Act. The obligations to submit a site assessment and to submit a permit application are imposed upon the "owner," the "operator," or the "permit applicant." Those terms are in the present tense, and there is no reference to requirements imposed upon past owners or operators. There are no provisions in the Act that address the complicated legal issues that arise if retroactive liability is imposed, such as a division of responsibility under the Act in the case of multiple past owners and operators of

mines that were sold or transferred after 1970. We are informed by counsel that the New Mexico courts do not interpret New Mexico laws to impose retroactive liability unless that intent is expressly stated in the statute.

The only environmental law that we are aware of that imposes retroactive liability on past facility owners and operators is the federal Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"). CERCLA contains very clear language imposing retroactive liability. The imposition of retroactive liability under CERCLA is highly controversial, and may be reconsidered by Congress because of the difficult legal issues and burdens that result from retroactive liability.

While the Mining Act Rules do not define "owner" or "operator," they are consistent with our interpretation that past mine owners or operators who have abandoned their legal interest in a mine are not required to obtain a permit. Indeed, the rules allow only current owners or operators to submit a permit application, and make it impossible for a past owner or operator to obtain a permit. The rule regarding permit applications for an existing mining operation states:

> D. Each application under this Rule shall contain the following:
>
> . . . . .
>
> 3. A statement of the basis on which the applicant has the right to enter the property to conduct the mining and reclamation. The applicant will allow the Director to examine, if necessary, the documents which establish such basis.

New Mexico Mining Act Rules, Rule 5.2.D. Western Nuclear has no legal right to enter Section 21 or Section 25 to conduct reclamation. Consequently, Western Nuclear could not satisfy this permit application requirement. Because a permit cannot be issued under Rule 5.2.F unless the permit application contains all of the required information, plus a statement by the applicant that "allows the Director to enter the permit area without delay during mining and reclamation," which Western Nuclear cannot provide, Western Nuclear cannot qualify for a permit. Therefore, the Rules themselves recognize that the Mining Act does not require a past owner or operator to obtain a permit.

The Mining Act also separately provides for reclamation of "abandoned or inactive non-coal mining areas." Section 69-26-19.B NMSA. The Act creates a state fund for this purpose. This section is further indication of the Legislature's intent that the Mining Act was not intended to require permits for abandoned mines. This is not to suggest that the Ruby 1 and Ruby 3 mines should be reclaimed using the fund. As discussed in our previous correspondence,

Western Nuclear reclaimed these mines before they were abandoned. Consequently, these mines may meet the reclamation standards established under the Act.

After you have had an opportunity to review this information, we would be happy to discuss this matter with MMD. However, for the reasons discussed in this letter and our previous correspondence, Western Nuclear continues to believe that it is not subject to the permitting or site assessment requirements for the Ruby 1 and Ruby 3 mines under the New Mexico Mining Act.

Sincerely,

E. Michael Schern
Manager

EMS/arr

January 4, 1996

Mr. Moe A. Pasha
Manager of Engineering Services
Western Nuclear, Inc.
Union Plaza Suite 300
200 Union Boulevard
Lakewood, CO 80228

Re: Prior Reclamation, Ruby #1 and #3 Mine Sites, Western Nuclear, Inc.

Dear Mr. Pasha:

Thank you for your letter of December 20, 1995 advising us of the completion of reclamation repairs on the Ruby #1 and #3 Mine Sites. The Mining and Minerals Division commends Western Nuclear, Inc. for their diligence in completing this work. We feel that we have a good working relationship with Western Nuclear and hope to work with your company again some day. It was a pleasure working with you and Mr. Peets.

Sincerely,

Holland Shepherd
Bureau Chief
Mining Act Reclamation Bureau
Mining and Minerals Division

WESTERN NUCLEAR, INC.

UNION PLAZA SUITE 300, 200 UNION BOULEVARD, LAKEWOOD, COLORADO 80228
TELECOPIER (303) 989-8993 TELEPHONE (303) 989-8675

December 20, 1995

DEC 26

Mr. Holland W. Shepherd
Bureau Chief
Mining Act Reclamation Bureau
Energy, Minerals and Natural Resources Department
2040 South Pacheco Street
Santa Fe, NM 87505

RE: 1995 Reclamation Repair Work for Western Nuclear, Inc., Ruby #1 Mine Site, Near Mariano Lake, McKinley County, New Mexico

Dear Mr. Shepherd:

This letter confirms our phone conversation of November 20, 1995 whereby I had indicated that Western Nuclear, Inc. (WNI) had successfully completed the reclamation repair work on November 11, 1995 at the Ruby #1 Mine site. The reclamation work was performed and completed in accordance with our understanding (to stabilize the erosion rills) following your site inspection of September 27, 1995 and as indicated in your report entitled "Prior Reclamation Inspection Report and Recommendation For Release or Permit Requirement, Western Nuclear, Inc. Ruby 1, 2, 3 and 4 Mines" dated September 29, 1995.

The reclamation repairs were performed in November, 1995. The work was inspected on November 20, 1995 and is briefly described as follows:

Numerous erosion rills that had developed on the north and west outslopes of the reclaimed area, measuring a total of approximately 2,500 feet in length, were stabilized by placing a 4-inch minus rock riprap inside the erosion rills. The placed rock was well-graded and placed in a manner to prevent degradation and segregation. Rock riprap material was placed so that the larger pieces were uniformly distributed, and the smaller pieces served to fill the spaces between them to provide a well-keyed, densely-placed layer of riprap.

The three (3) deep erosion rills that had formed along the north outslopes were first back-filled with clean on-site borrow soil which was covered by a geotextile fabric, which in turn was overlain by the rock riprap layer.

The entire reclaimed site is erosionally stable.

Thank you for approving the reclamation work already completed at both the Ruby #1 and Ruby #3 Mine sites and for releasing WNI from any future reclamation work and further requirements of the New Mexico Mining Act (NMMA) Rules on the Ruby 1, 2, 3 and 4 Mines.

It was a pleasure working with you and your staff on this job.

Very truly yours,

M.A. Pasha
Manager of Engineering Services

cc: K.C. Bennett

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

BRUCE KING
GOVERNOR

October 27, 1994

ANITA LOCKWOOD
CABINET SECRETARY

Mr. E. Michael Schern
Manager
Western Nuclear, Inc.
Union Plaza Suite 300
200 Union Boulevard
Lakewood, Colorado 80228

Re: Site Status of the Ruby 1 and Ruby 3 Mines McKinley County

Dear Mr. Schern:

This letter is in response to your letter dated September 6, 1994. I apologize for this late response. In the letter Western Nuclear, Inc. (WNI) is asserting that the Mining Act does not apply to the two sites identified above, because the sites are located on indian lands and secondly because these sites are no longer under the ownership or operation of WNI.

Prior to the Mining and Minerals Divsion (MMD) making any further judgement, council advises that we ask you the following questions:

1. Is the land upon which these sites are located considered to be Navajo Tribal Trust Land or Reservation Land.

2. Who owns the actual mineral estate of the properties in question.

3. Is BIA supervising the reclamation of the properties pursuant to lease terms or does the BIA have regulations applicable to the reclamation.

4. How was the BLM involved in supervising the reclamation, and under what authority?

It is our interpretation of the Act that not being the current operator/owner would not exonerate WNI from having to permit the operations, if the operations are considered existing and WNI was responsible for operation of the sites during the time frame defined for and existing mine operation. Please see the defenition for an "existing mine operation", below, for the specied time frame:

"Existing mining operation" means an extraction operation that produced marketable minerals for a total of at least two years between January 1, 1970 and June 18, 1993.

To allay any fears MMD has not yet found WNI to be in violation of the Mining Act.

Please contact me if you have any questions in addressing this letter.

Sincerely,

Holland Shepherd
Bureau Chief
Mining Act Reclamation Bureau

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

SEP - 8 1994

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Western Nuclear, Inc.
Ruby Mines #1-4
200 Union Blvd, Suite 300
Lakewood, CO 80228

4a. Article Number

Z 062 024 441

4b. Service Type

☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery

9-6-94

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

D Smallwood

PS Form **3811**, December 1991 ☆ U.S.G.P.O.: 1992-307-530 **DOMESTIC RETURN RECEIPT**

WESTERN NUCLEAR, INC.

UNION PLAZA SUITE 300, 200 UNION BOULEVARD, LAKEWOOD, COLORADO 80228
TELECOPIER (303) 989-8993 TELEPHONE (303) 989-8675

Holland -
Please take care of this. John 9/12/94

September 6, 1994

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
P 377 648 315

Mr. John Lingo, Acting Director
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

Re: New Mexico Mining Act - Ruby 1 & Ruby 3 Mines

Dear Mr. Lingo:

Western Nuclear, Inc. (WNI) received the New Mexico Energy, Mineral and Natural Resources Department - Mining and Minerals Division (MMD) August 31, 1994 certified letter regarding compliance with the New Mexico Mining Act, and WNI requests clarification with respect to the directions which you have given. On April 7, 1994, WNI responded to your February 2, 1994 memo regarding the deadline for submittal of Site Assessments under section 5 of the New Mexico Mining Act, outlining the reasons why WNI believes that the Ruby Mines do not fall within legal jurisdiction of the Act. On April 28, 1994, you acknowledged receipt of that letter, and indicated that you would place our letter in the record and contact us at a later date, if necessary.

Your recent August 31, 1994 letter indicates that WNI should advise you if we do not believe that our property falls under the requirements of the Act. I have attached copies of the earlier correspondence referenced above for that purpose. To reiterate, and to make our position clear, the information included in the previous correspondence will be repeated.

On July 19, 1993, WNI filed *1993 New Mexico Mining Act Owner/Operator Information Requirements* forms for the Ruby 1 (Sec. 21) and Ruby 3 (Sec. 25) sites in New Mexico. The properties are located in Sections 21 and 25, T15N, R13W NMPM. Reclamation work on these two mines was completed in the 1980's under supervision of the Bureau of Indian Affairs/Bureau of Land Management. WNI is currently seeking the release of a reclamation bond held by the Bureau of Indian Affairs. As discussed below, it is WNI's position that the Act does not apply to Western Nuclear.

WNI operated these two mines several years ago. The surface of these reclaimed mining sites are Navajo Tribal Trust Lands. Furthermore, we are informed that the

Navajo Tribe has taken the position that the State of New Mexico does not have jurisdiction to apply the New Mexico Mining Act on its lands, whether within or outside of the boundaries of the Reservation.

WNI has no current ownership or lease interest in either the surface or mineral estate on these lands, and has no legal right of access. Because the New Mexico Mining Act appears to apply only to current owners or operators, and because the lands on which these mines are located do not appear to be subject to state jurisdiction, WNI does not intend to submit a Site Assessment for these properties under section 5 of the Act. WNI intends to satisfy any remaining reclamation obligations for these lands through the Bureau of Indian Affairs.

I hope that this information clarifies the reasons why WNI has not submitted a site assessment. The attached letters confirm MMD's receipt of WNI's earlier correspondence on this matter. We understand that the Act does not apply to these properties and therefore WNI asserts that we are not in violation of the Act, as your August 31, 1994 letter suggests. We wish to cooperate fully with MMD, and do not wish to be issued a violation or cessation order. Please call me at (303) 989-8675 and advise if any additional information is required.

Sincerely,

E. Michael Schern
Manager

/ms
enclosures

State of New Mexico
ENERG' . ERALS and NATURAL RESOURCE .. ARTMENT
Santa Fe, New Mexico 87505

April 28, 1994

RECEIVED
MAY - 2 1994
WESTERN NUCLEAR INC.

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

E. Michael Schern, Manager
Western Nuclear, Inc.
Union Plaza Suite 300
200 Union Boulevard
Lakewood, Colorado 80228

Dear Mr. Schern:

Thank you for your letter of April 7, 1994 and the information pertaining to your operations in New Mexico.

We appreciate you taking the time to contact us. Since we are still in the rule-making process, we are unable to comment at this time. We will place your letter as a part of the record and contact you at a later date, if necessary.

Sincerely,

John Lingo, Acting Director
Mining and Minerals Division

VILLAGRA BUILDING - 408 Galisteo
Forestry and Resources Conservation Division
P.O. Box 1948 87504-1948
827-5830

Park and Recreation Division
P.O. Box 1147 87504-1147
827-7465

~~2040 South Pacheco~~
~~Office of the Secretary~~
827-5950

Administrative Services
827-5925

Energy Conservation & Management
827-5900

Mining and Minerals
827-5970

LAND OFFICE BUILDING - 310 Old Santa Fe Trail
Oil Conservation Division
P.O. Box 2088 87504-2088
827-5800

5: 4/19/94
TO: Rick M
Prepare an or have one prepare
appropriate response
for my signature.
Thanks
Jim

WESTERN NUCLEAR, INC.

UNION PLAZA SUITE 300, 200 UNION BOULEVARD, LAKEWOOD, COLORADO 80228
TELECOPIER (303) 989-8993 TELEPHONE (303) 989-8675

April 7, 1994

RECEIVED
APR 13 1994
MINING & MINERALS DIVISION

Mr. John Lingo, Acting Director
Mining and Minerals Division
Energy, Minerals and Natural Resources Department
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Western Nuclear - Ruby 1 and Ruby 3 Mines, McKinley County

Dear Mr. Lingo:

We are in receipt of your memorandum of February 2, 1993 regarding the upcoming deadline for submittal of Site Assessments under section 5 of the New Mexico Mining Act (the "Act"), § 69-36-5 NMSA 1978. On July 19, 1993, Western Nuclear filed *1993 New Mexico Mining Act Owner/Operator Information Requirements* forms for the Ruby 1 (Sec. 21) and Ruby 3 (Sec. 25) sites in New Mexico. The properties are located in Sections 21 and 25, T15N, R13W. Reclamation work on these mines was completed in the 1980's under supervision of the Bureau of Indian Affairs/Bureau of Land Management. Western Nuclear is currently seeking release of a reclamation bond held by the Bureau of Indian Affairs. As discussed below, it now appears that the Act does not apply to Western Nuclear.

Western Nuclear operated these two mines several years ago. The surface of these reclaimed mining sites are Navajo Tribal Trust Lands. Furthermore, we are informed that the Navajo Tribe has taken the position that the state does not have jurisdiction to apply the Act on its lands, whether within or outside of the boundaries of the Reservation.

Western Nuclear has no current ownership or lease interest in either the surface or mineral estate on these lands, and has no legal right of access. Because the Act appears to apply only to current owners or operators, and because the lands on which these mines are located do not appear to be subject to state jurisdiction, Western Nuclear, Inc. does not intend to submit a Site Assessment for these properties under section 5 of the Act. Western Nuclear intends to satisfy any remaining reclamation obligations for these lands through the Bureau of Indian Affairs.

Sincerely,

E. Michael Schern
Manager

EMS:djs

Prior Reclamation Inspection Schedule
Ruby 1 and 3 Mines
Western Nuclear, Inc.

Holland Shepherd and Robert Young

Meeting Time	Meeting Place	Contact Person
Wed. Sept. 27 8:30 am	Lobby, Comfort Inn 2300 Yale Blvd. Albuquerque, NM	Moe Pasha, Mgr. Eng. Serv. Western Nuclear, Inc. (303) 989-8675
Wed. Sept. 27 10:00 am	Table near Casher Iron Skillet Restaurant Milan, NM	Bob Peets, Mine Mgr., Ret. Western Nuclear, Inc.
Wed. Sept. 27 11:00 am	Ruby 1 and 3 Mine Inspection Sites near Thoreau, NM	

Ruby 3 Sect 25 Oxy Corp

Reclaimed 1985, repaired 1998

Ruby 1 Sect 21 MP2 Land Co

Reclaimed 1985, repaired 1993

repairs needed ~~Oxy. Corp.~~

Navajo Trust Lands

Mineral Rights private

WESTERN NUCLEAR, INC.

MEMORANDUM

DATE: 22 JUNE 1990

TO: THE FILE

FROM: S. J. BAKER

SUBJECT: NEW MEXICO RUBY MINES' RECLAMATION -- SITE VISIT BY BOB PEETS

On 08 June 1988, Bob Peets visited the reclaimed Ruby Mines lands to ascertain the status of any erosion at the sites.

SITE HISTORY

For the record:

Section 25 [Ruby 3] reclamation: started 25 June 1985 and completed 31 December 1985. The portal was closed and covered, and all buildings were removed. The power line was turned over to the Navajo Power Company who salvaged and removed the line in the fall of 1987. The water system was officially turned over to the Navajo Water Company; however, the system was not being used during Mr. Peets' June 1988 visit because the power line that fed power to generate the water pump had been ripped out.

Section 26 [Ruby 4] reclamation: completed 09 October 1985. Only the ventholes were filled. Mr. Peets has a letter from the government accepting these activities.

The Ruby 4 mine fed through the Ruby 3 shaft, and a bulkhead was placed between the mines during reclamation.

Section 21 [Ruby 1 & 2] reclamation: completed in 1985. The average ore grade was 0.17% U_3O_8. The Ruby 2 mine fed through the Ruby 1 shaft. The Ruby 1 mine shaft was sealed with a concrete wall, everything else was ripped out, and the remaining opening was backfilled and reseeded. A windmill landmarks to the northeast of the site.

During reclamation, the spoils pile was covered with at least ten [10] feet of clean fill material [source of fill was original soils area that now underlies the reclaimed spoils pile. Prior to mining, the soils in the area were excavated and stockpiled for later reclamation].

With approval of the tribe, the shop building was sold to

Evelyn Charly for one dollar, and she assumed responsibility for reclamation of the site.

1988 STATUS OF MINE SITES

On 08 June 1988, Bob Peets inspected the sites.

Section 25 [Ruby 3]:
SEE ATTACHED SITE SCHEMATIC AND CORRESPONDING PHOTOS.

Photo #17 shows a little erosion on top of the stockpile; however, this erosion is not significant and is difficult to see. There are a couple of bare spots where revegation has failed [see photo #13, 16, 17]. Vehicle tracks are evident on the top of the pile [see photo #16].

Section 21 [Ruby 1 & 2]:
SEE ATTACHED SITE SCHEMATIC AND CORRESPONDING PHOTOS.

Apparently, someone at the local trading post bought the shop building from Evelyn Charley and moved it off the mine site. Only a concrete pad remains. Sheep grazing is occurring on the reclaimed mine site.

There are two [2] erosion related rivulets, each to a depth of six - eight inches. One erosion rivulet is located on the north side of the spoils pile, and the other rivulet is located on the northeast corner of the spoils pile [recall, the spoils pile was covered were at least 10 feet of cover materials; so, erosion two to three years following reclamation is only about 6 inches in the 10 feet of cover material]. The rivulets are not expanding. Photo #4 shows a detailed shot of the north side rivulet, and photos #13, 14, and 15 show the rivulets on the northeast corner of the reclaimed spoils pile.

Added note to file: surface water runoff fows from the south by the old changeroom building to the north over the reclaimed spoils pile.

TE OF NEW MEXICO
NVIRONMENTAL
MPROVEMENT
IVISION

TONEY ANAYA
GOVERNOR

DENISE D. FORT
DIRECTOR

August 29, 1986

Western Nuclear, Inc.
Environmental Division
134 Union Blvd
Lakewood, CO 80215

Dear Sir,

I am enclosing a copy of the Site Inspection report describing the conditions at the site of the Section 21 uranium mine formerly operated by Western Nuclear ,Inc. Based on our investigations, we are recommending no further action at this time.

Please feel free to contact me in writing or at (505) 827-2898 with any inquires or comments you have concerning this transmittal.

Yours truly,

Richard A Lawlings

for Steven Cary, Acting Manager
CERCLA Program

SITE INSPECTION SUMMATION

Further action under the CERCLA Program at the Western Nuclear Mine site is not considered necessary. Any immediate threat to health, welfare and the environment has been dealt with and a preliminary ranking of the site on the Hazardous Ranking System indicates that the site would only score in the 16 - 17 range. The Navajo Nation Environmental Protection Administration is aware of the situation at this site and has the technical expertise and authority to monitor and to ensure that current conditions are maintained.

The immediate impact of the contaminated material on the health and welfare of the near-by residents and the local environment has been mininized by the remedial action that was performed by the company. The mine adit was closed and the waste pile was graded to more natural contours before being covered with approximately 12 inches of topsoil and then planted with grass seed. Although the grasses are developing well in this first growing season some erosion gullies have formed. Maintenance of the cover material while the vegetation becomes established would minimize the erosion problem. The company donated the only building remaining on-site to a nearby resident. Plans to move this building are being supervised by the Navajo Nation EPA.

Additional reasons for proposing no further action at this site are:

Depth to ground water is about 400 feet and local use is limited to stock watering. The Smith Lake Community Water Supply System supplies drinking water to residences in the area;

Cover soil effectively reduces the amount of radon gas being released;

Streams in the area are intermittent and have no specific use;

No population center is within 3 miles. Population within a 3 mile radius is probably less than 1000 and is grouped in small clusters of 2 to 5 houses.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION	SITE NUMBER (to be assigned by Hq)
VI	NM01911

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition *(Section II)*. File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET *(or other identifier)*		
Western Nuclear Mine	4½ miles west on Navajo Route 49 from (cont'd S Attachment		
C. CITY	**D. STATE**	**E. ZIP CODE**	**F. COUNTY NAME**
Smith Lake	NM	86515	McKinley

G. SITE OPERATOR INFORMATION

1. NAME	2. TELEPHONE NUMBER		
Western Nuclear, Inc.	(303) 986-4571		
3. STREET	**4. CITY**	**5. STATE**	**6. ZIP CODE**
134 Union Blvd	Lakewood	CO	80215

H. REALTY OWNER INFORMATION *(if different from operator of site)*

1. NAME	2. TELEPHONE NUMBER	
The Navajo Nation, Window Rock, AZ Contact: Levon Benally, Division of Resources	(602) 871-6534	
3. CITY	**4. STATE**	**5. ZIP CODE**
Window Rock, Arizona	AZ	86515

I. SITE DESCRIPTION

A uranium mine waste pile containing both mine spoil and ore was covered with top soil in mid 1985. Runoff from the pile (Cont'd See Attachment A)

J. TYPE OF OWNERSHIP

[XX] 1. FEDERAL [ ] 2. STATE [ ] 3. COUNTY [ ] 4. MUNICIPAL [ ] 5. PRIVATE

II. TENTATIVE DISPOSITION *(complete this section last)*

A. ESTIMATE DATE OF TENTATIVE DISPOSITION *(mo., day, & yr.)*	B. APPARENT SERIOUSNESS OF PROBLEM
	[ ] 1. HIGH [ ] 2. MEDIUM [X] 3. LOW [ ] 4. NONE

C. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*
Richard A.Rawlings	(505) 827-2911	August 13, 1986

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION

1. NAME	2. TITLE	
Steven J. Cary	Acting Manager, MSCA-PA/SI Program	
3. ORGANIZATION		**4. TELEPHONE NO. *(area code & no.)***
NM Envir.Improvement Division, Ground Water/Hazardous Waste Bur.		(505 827-2898

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Richard A.Rawlings	NMEID, GW/Haz.Waste Bureau	(505) 827-2911
Bobby Lopez	NMEID, Milan Field Office	(505) 287-8845

C. SITE REPRESENTATIVES INTERVIEWED *(corporate officials, workers, residents)*

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
Levon Benally	Envir. Specialist (602) 871-6534	Navajo Nation, Division of Resources P.O.Box 308, Window Rock, AZ 86515
Gene Little	As Above	As Above
Vernon Tsosie	(602) 729-5281	As Above
Carol Boughton	Hydrologist (602) 729-5281	As Above

Continued From Front

III. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Western Nuclear, Inc.	(303) 986-4571	134 Union Blvd, Lakewood, Co 80215	Uranium Mine Spoils

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
July 10, 1986	0915 - 1156	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER (describe)

Fine, warm and sunny. 60 - 70 degrees Fahreneit

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER	X		
b. SURFACE WATER	X	Scientific Laboratory Division	
c. WASTE	X	Health and Envir. Dept., 700 Camino de Salud, NE Albuquerque, NM 87106	August 8, 1986
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL	X		
h. VEGETATION			
i. OTHER (specify)			

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS

Continue On Page 3

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL

2. PHOTOS IN CUSTODY OF: Attached

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: A copy of USGS topographical map is attached.

E. COORDINATES

1. LATITUDE (deg.-min.-sec.): 35 - 31 - 15 N

2. LONGITUDE (deg.-min.-sec.): 108 - 13 - 30 W

V. SITE INFORMATION

A. SITE STATUS

[ ] 1. ACTIVE *(Those inductrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)*

[X] 2. INACTIVE *(Those sites which no longer receive wastes.)*

[ ] 3. OTHER *(specify):* _____ *(Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)*

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES *(specify generator's four-digit SIC Code):* 1094

C. AREA OF SITE *(in acres)*: Approx 15 acres

D. ARE THERE BUILDINGS ON THE SITE?

[ ] 1. NO [X] 2. YES *(specify):* A metal maintenance building on-site

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity*(ies)* and details relating to each activity by marking 'X' in the appropriate boxes.

'X'	A. TRANSPORTER	'X'	B. STORER	'X'	C. TREATER	'X'	D. DISPOSER
	1. RAIL	X	1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE		3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
	6. OTHER *(specify):*		6. OTHER *(specify):*		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY	X	8. OTHER *(specify):* Pile
					9. OTHER *(specify):*		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this for..

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [ ] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL

[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[ ] 1. LIQUID [X] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [X] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE

[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE

[ ] 9. OTHER *(specify):*

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

NO

Continue On Reverse

Continued From Front

VII. WASTE RELATED INFORMATION (continued)

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT	AMOUNT	AMOUNT	AMOUNT	AMOUNT: Approx. 200,000	AMOUNT
UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE: cu. yards	UNIT OF MEASURE
	X (1) OILY WASTES			X (1) FLYASH	X (1) LABORATORY, PHARMACEUT.
(1) PAINT, PIGMENTS	(2) OTHER (specify):	(1) HALOGENATED SOLVENTS	(1) ACIDS	(2) ASBESTOS	(2) HOSPITAL
(2) METALS SLUDGES		(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	X (3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
(5) OTHER (specify):			(5) DYES/INKS	(6) OTHER (specify):	
			(6) CYANIDE		
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			(10) METALS		
			(11) OTHER (specify):		

D. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Uranium	X			X				--------	Unkown	
Lead - 210	X			X				-------	"	
Radium - 226	X			X				--------	"	
Thorium - 230	X			X				-------	"	

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

[X] A. HUMAN HEALTH HAZARDS

Area is unsecured and readily accessible. Several residences are within ½ mile, however the area is generally sparsely populated.

Continue On Page 5

Continued From Page 4

VIII. HAZARD DESCRIPTION *(continued)*

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☒ E. CONTAMINATION OF FOOD CHAIN

Sheep graze the area. Radioactive substances could be ingested by sheep either by eating the vegetation or drinking contaminated run-off water.

☒ F. CONTAMINATION OF GROUND WATER

Water from a windmill used to water stock showed significantly elevated levels of uranium, thorium and radium. Depth and construction of the well is unkown. The well may be drawing water from an aquifercontaining naturally occurring radioactive material.

☒ G. CONTAMINATION OF SURFACE WATER

Analyses of sediments suggest that contamination has not entered the arroyo which carries run-off water from the pile.

VIII. HAZARD DESCRIPTION (continued)

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☒ J. CONTAMINATION OF AIR

The breakdown of radioactive material in the pile is no doubt releasing radon gas to the atmosphere. This will have been reduced by the 12 inches of cover soil that was applied to the pile. No monitoring was performed to verify this.

☐ K. NOTICEABLE ODORS

☒ L. CONTAMINATION OF SOIL

Some contamination of soil at the toe of the pile was shown.

☐ M. PROPERTY DAMAGE

Continue on Page 7

Continued From Page 6

VIII. HAZARD DESCRIPTION (continued)

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☒ Q. EROSION PROBLEMS

In mid 1985 the pile was graded and contoured to more natural slopes and the entire surface covered with approximately 12 inches of soil trucked in from outside. The site was then revegetated with a mixture of grasses. In July, 1986, the grass cover, although being grazed, was well developed. Several erosion gullies, 6 to 9 ins deep had developed exposing the waste material.

☒ R. INADEQUATE SECURITY

Area is unsecured. However it is in an isolated and sparsely populated area.

☐ S. INCOMPATIBLE WASTES

VIII. HAZARD DESCRIPTION *(continued)*

☐ T. MIDNIGHT DUMPING

☐ U. OTHER *(specify)*:

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE *(specify units)*
1. IN RESIDENTIAL AREAS	20 - 25	20 - 25	5 Residences	½ mile
2. IN COMMERCIAL OR INDUSTRIAL AREAS	0	0	0	½ mile
3. IN PUBLICLY TRAVELLED AREAS	20 veh./ day	20 veh./ day	0	½ mile
4. PUBLIC USE AREAS *(parks, schools, etc.)*	0	0	0	2 miles

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER *(specify unit)*	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
Approx. 400 feet	To North-east	Stock watering/Drinking
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY** *(specify unit of measure)*	**F. DIRECTION TO DRINKING WATER SUPPLY**
5 - 20 gallons/min	Smith Lake (5 miles)	East

G. TYPE OF DRINKING WATER SUPPLY

☐ 1. NON-COMMUNITY < 15 CONNECTIONS* ☒ 2. COMMUNITY *(specify town)*: > 15 CONNECTIONS ~~SMith Lake Community Supply System~~

☐ 3. SURFACE WATER ☒ 4. WELL

Continue On Page 9

Continued From Page 8

X. WATER AND HYDROLOGICAL DATA (continued)

H. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
None				

I. RECEIVING WATER

1. NAME: Puerco River

☐ 2. SEWERS ☒ 3. STREAMS/RIVERS ☐ 4. LAKES/RESERVOIRS ☐ 5. OTHER (specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

Unclassified

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN:

☒ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☒ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

'X'	A. OVERBURDEN	'X'	B. BEDROCK (specify below)	'X'	C. OTHER (specify below)
X	1. SAND				
X	2. CLAY		Mancos Shale Dakota Sandstone		
	3. GRAVEL		Morrison Formation		

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)

☐ D. MODERATE (10 to .1 cm/sec.) ☒ E. LOW (.1 to .001 cm/sec.) ☐ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☒ 1. YES ☐ 2. NO 3. COMMENTS: Recharge of superficial aquifers only; No recharge of the Morrison Formation, the main water supply aquifer, occurs.

H. DISCHARGE AREA

☐ 1. YES ☒ 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE: 20%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.: West. Some erosion of the cover soil has occurred.

J. OTHER GEOLOGICAL DATA

Continue On Reverse

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X')		
					1. YES	2. NO	3. UNKNOWN
None							

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☒ NONE ☐ YES (summarize in this space)

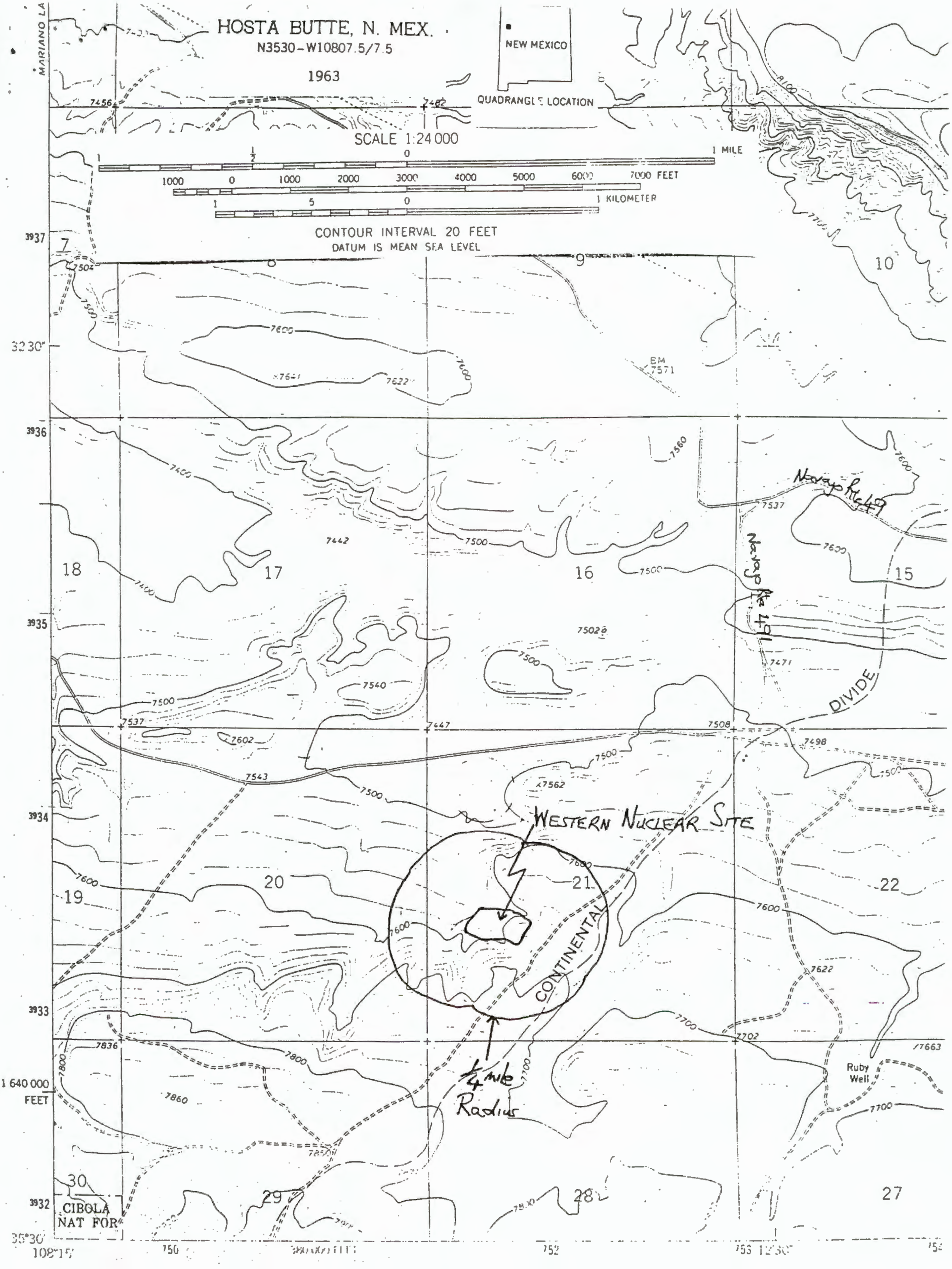
NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

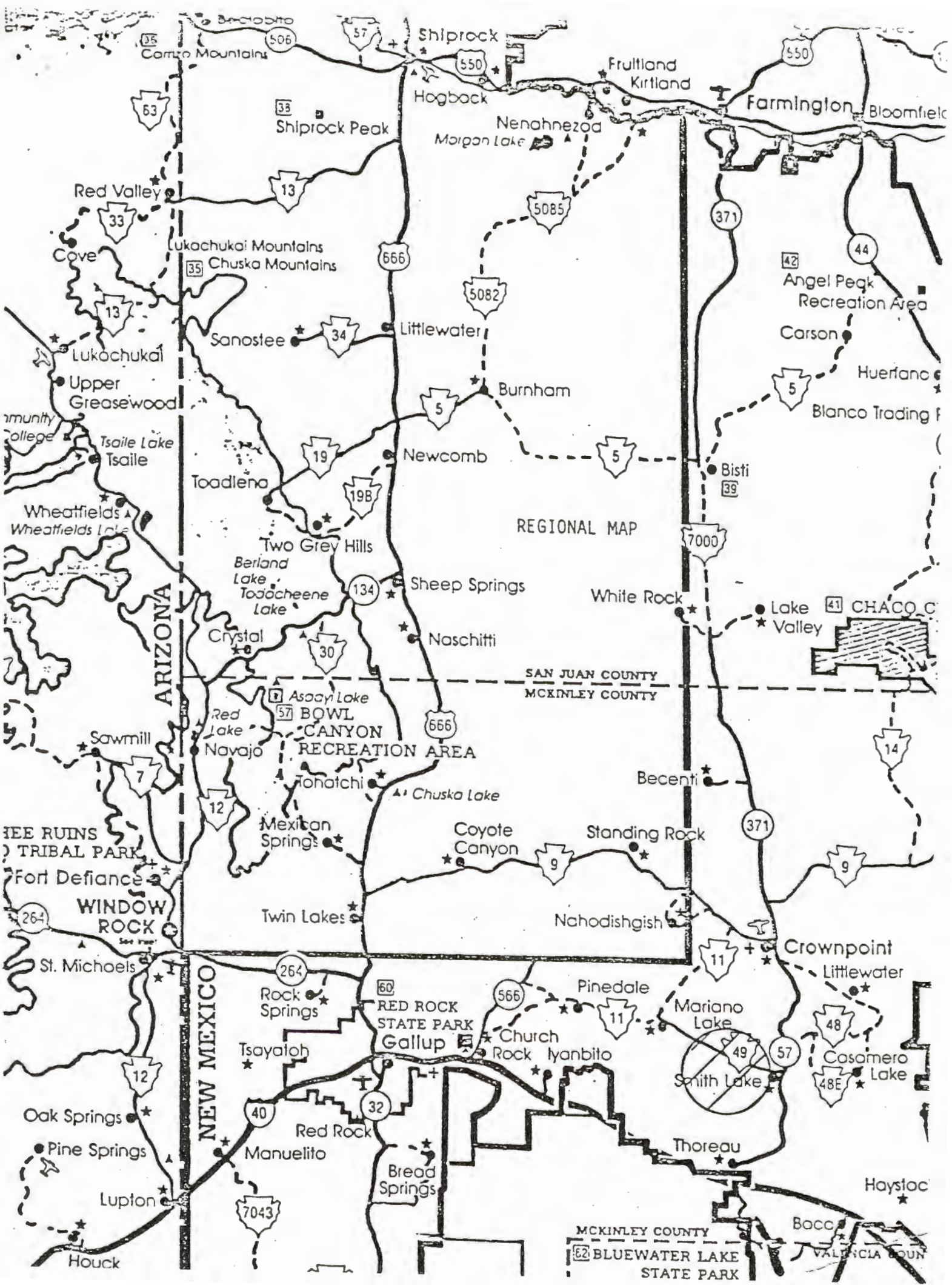
ATTACHMENT A

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT SUPPLEMENT SHEET

Instruction - This sheet is provided to give additional information in explanation of a question on the form T2070-3.

Corresponding number on form	Additional Remark and/or Explanation
Section 1.B. (cont'd)	the junction with State Route 57 at Smith Lake, then 1.6 miles south and west on Navajo Route 491, then 0.8 miles south on unmarked dirt road.
SEction 1.I.	enters an arroyo 50 yards from the toe of the pile. The pile contains approximately 200,000 cubic yards.


HOSTA BUTTE, N. MEX.
N3530-W10807.5/7.5
1963
NEW MEXICO
QUADRANGLE LOCATION
SCALE 1:24 000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
MARIANO LA
Navajo Rte 49
Navajo Rte 49
DIVIDE
CONTINENTAL
Western Nuclear Site
1/4 mile Radius
Ruby Well
CIBOLA NAT FOR
1 640 000 FEET
35°30'
108°15'
12'30"


REGIONAL MAP
ARIZONA
NEW MEXICO
SAN JUAN COUNTY
MCKINLEY COUNTY
MCKINLEY COUNTY
Shiprock
Hogbock
Fruitland
Kirtland
Farmington
Bloomfield
Shiprock Peak
Nenahnezad
Morgan Lake
Red Valley
Cove
Lukachukai Mountains
Chuska Mountains
Angel Peak
Recreation Area
Carson
Huerfano
Blanco Trading P
Sanostee
Littlewater
Lukachukai
Upper
Greasewood
Burnham
Tsaile Lake
Tsaile
Newcomb
Toadlena
Bisti
Wheatfields
Wheatfields Lake
Two Grey Hills
Berland
Lake
Todacheene
Lake
Sheep Springs
White Rock
Lake
Valley
CHACO C
Crystal
Naschitti
Asaayi Lake
BOWL
CANYON
RECREATION AREA
Red
Lake
Navajo
Sawmill
Tohatchi
Chuska Lake
Becenti
Mexican
Springs
Coyote
Canyon
Standing Rock
Fort Defiance
WINDOW
ROCK
Twin Lakes
Nahodishgish
Crownpoint
St. Michaels
Littlewater
Rock
Springs
RED ROCK
STATE PARK
Gallup
Church
Rock
Iyanbito
Pinedale
Mariano
Lake
Tsayatoh
Smith Lake
Casamero
Lake
Oak Springs
Red Rock
Pine Springs
Manuelito
Thoreau
Bread
Springs
Haystac
Lupton
Houck
Bacc
BLUEWATER LAKE
STATE PARK

REPORT TO: STEVEN O. GRAY
Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

LAB NUMBER IR1-6 256
DATE RECEIVED 7-11-86
DATE REPORTED 4-Aug-86 LABerge (Initials)
SLD USER CODE NUMBER 53400

Well Location Address WESTERN NUCLEAR MINE SITE

Point of Collection Evelyn Charlie's residence

Well ~~Owner~~/User (Owner) ~~Evelyn Charlie~~ Smith Lake Community Supply

Number of People Drinking Water from Well

Collected 7/10/86 (Date) 1146 (Time) By Gary Rawlings (Name) EID (Agency)

Well Depth Approx. 1600 ft.

Water Level Unknown

Taste? Odor? Color? Collectors Remarks

pH

Conductivity (Uncorrected) umho/cm

Temperature °C

Conductivity at 25°C umho/cm

PROJECT:

From ____, A-H_2SO_4 Sample:

☐ Nitrate-N^+ Nitrite-N	mg/l		
☐ Ammonia-N	mg/l		
☐ Chemical oxygen demand	mg/l		
☐			

From 1x1l, A-HNO_3 Sample:

- ☐ ICAP Scan
- ☐ Metals by AA (Specify) U Th-230 Ra-226 Po-210 Pb-210

From ____, NA Sample:

			Date Analyzed
☐ Calcium	mg/l		
☐ Potassium	mg/l		
☐ Magnesium	mg/l		
☐ Sodium	mg/l		
☐ Bicarbonate	mg/l		
☐ Chloride	mg/l		
☐ Sulfate	mg/l		
☐ Total Solids	mg/l		
☐			

Wet Chemistry See Attached

RECEIVED AUG - 8 1986 LIQUID WASTE SURVEILLANCE GROUND WATER

This form accompanies 1x1l sample(s) marked as follows to indicate field treatment:

- NF: Whole sample (no filtration)
- F: Filtered in field with 0.45u membrane filter
- A-H_2SO_4: Acidified with 2 ml conc H_2SO_4/l
- A-HNO_3: Acidified with 5ml conc HNO_3/l
- NA: No acid added

URANIUM, ISOTOPIC

SAMPLE TYPE: LITER

SAMPLE #: RC-86 0286

ANALYZED: 23-JUL-86 through 25-JUL-86
CALCULATED: 25-JUL-86

|*| USER or | | QC: | | Known | | Blank | | Spike | | Rep.

METHOD: 'SLD's RC determination of Uranium by sequential separation and alpha counting methods.

SAMPLE (Size & Description): 0.5000 LITER of the user's sample which was modified at SLD by a pre-analytical treatment.

RESULTS:

Isotope		Activity		
U-234	=	2.015 +-	0.296	pCi/LITER
U-235	=	0.042 +-	0.009	pCi/LITER
U-238	=	0.916 +-	0.196	pCi/LITER
Sum	=	2.974 +-	0.208	pCi/LITER

Analytical Blanks Of:
0.260 +/- 0.060 pCi/Anal. for U-234, and
0.140 +/- 0.040 pCi/Anal. for U-238 were used in the calculation of the results.

U-232 Tracer Usage:
100.0 UL @ 0.086 +/- 0.001 pCi/UL = 8.60 +/- 0.10 pCi Added.
Tracer Batch: FEB-84 U I Calibrated: FEB-84
Chemical & Counting Efficiency: 0.220 cps/dps

Counting Data Summary:

	U-238 (cps)	U-234 (cps)	U-232 (cps)
Sample Gross:	0.00490 +/- 0.00070	0.01040 +/- 0.00102	0.06990 +/- 0.00264
Sample Bkg:	0.00004 +/- 0.00003	0.00010 +/- 0.00004	0.00002 +/- 0.00002
Sample Net:	0.00486 +/- 0.00070	0.01030 +/- 0.00102	0.06988 +/- 0.00264
	Ratio: U-234 / U-238	2.119 +/- 0.371	

REVIEWED/APPROVED: JC Lusk DATE: 25 Jul 86
JC LUSK, Analyst Book: U # 8 P. 81

REMARKS

- Uncertainties are expressed as +/- one standard deviation.
- Small negative or positive results, which are <= two standard deviations, should be interpreted as including 'zero'; as 'not detected'; or as 'less than twice the standard deviation'.
- Reported U-235 result is a calculated value based on the measured U-238 content, i.e. U-235 = 4.63% of the measured U-238 result.

THORIUM - 230

SAMPLE TYPE: LITER

SAMPLE #: RC-86 0286

ANALYZED: 23-JUL-86 through 25-JUL-86
CALCULATED: 25-JUL-86 08:05

|X| USER or | | QC: | | Known | | Blank
| |Spike | | Ref.

METHOD: SLD's RC determination of Thorium by sequential separation and alpha counting methods.

SAMPLE (Size & Description): 0.5000 L of the user's sample which was modified at SLD by a pre-analytical treatment.

RESULTS:

Isotope		Activity
Th-230	=	0.258 +- 0.198 pCi/L

Analytical Blanks Of:
0.280 +/- 0.070 pCi/Anal. for Th-230 was the blank used in the calculation of the result.

Th-230 Reference Sample:
50.0 uL of OCT-84 TH I Th-230 known solution at 1.520 +- 0.040 pCi/uL = 76.000 +- 2.00 pCi of Th-230 as the reference activity.

Th-234 Tracer Usage:
100.0 uL of 15-MAY-86 's tracer were added to the sample and 24.00 +- 0.34 cps were recovered.
100.0 uL of 15-MAY-86 's tracer were added to the reference and 24.77 +- 0.35 cps were recovered.
Recovery Ratio as Sample/Reference: 0.97

RECEIVED
AUG - 8 1986
LIQUID WASTE/GROUND WATER SURVEILLANCE

Counting Data Summary:

	Sample Th-230 (cps)	Reference Th-230 (cps)
Gross:	0.00370 +/- 0.00061	0.69810 +/- 0.00836
Bks:	0.00006 +/- 0.00003	0.00010 +/- 0.00004
Net:	0.00364 +/- 0.00061	0.69800 +/- 0.00836

REVIEWED/APPROVED: J C Lusk DATE: 25 July 86
J C LUSK, Analyst Book: Th # 8 P. 71

REMARKS

- Uncertainties are expressed as +/- one standard deviation.
- Small negative or positive results, which are <= two standard deviations, should be interpreted as including 'zero'; as 'not detected'; or as 'less than twice the standard deviation'.

Ra-226 ANALYSIS

SAMPLE TYPE: WATER, filtered

SAMPLE #: RC-86-286 -00

ANALYZED: 24-JUL-86 through 1-AUG-86
CALCULATED: 01-AUG-86 10:27

|#| USER or | | QC: | | Known | | Blank | | Spike | | Rep.

METHOD: SLD RC Sequential

SAMPLE (Size & Description): 0.5000 Liter of the user's sample which was modified at SLD by a pre-analytical treatment.

RESULTS:

Isotope		Activity	Detection Limit
Ra-226	=	0.379 +- 0.040 pCi/Liter	

DATE	TIME (MST)	MIN FROM T(sep)	
24-JUL-86	13:46	-9704.	Bubbler purged....Rn-222 ingrowth begins.
31-JUL-86	7:30	0.	Bubbler harvested by emanation to Lucas cell....Rn-222 ingrowth ends. Daughters of Rn-222 begin their ingrowth. Lucas cell placed in counting chamber for dark adjustment.
31-JUL-86	12:19	289.	Start of counting period.

Gross Counts	Counting Period	Gross cpm
1625.	1127.	1.442

1-AUG-86	7:06	1416.	End of counting period....Analysis completed.

CALCULATIONS:

Decay-corrected Net Activity at T(sep):	0.696 +/- 0.044 cpm
Apply Counter's Efficiency:	0.124 +/- 0.008 pCi
Apply Rn-222 Ingrowth Factor:	0.175 +/- 0.012 pCi
Divide by Chemical Yield:	0.219 +/- 0.015 pCi
Subtract Reagent Blank:	0.189 +/- 0.018 pCi
Divide by Analytical Sample Size:	0.379 +/- 0.040 pCi/Liter

Using:

Chemical Yield(2):	80.0 +/- 4.0 % Recovery
Rn-222 Ingrowth:	70.6 % of Equilibrium
Counter's Background:	0.816 +/- 0.016 cpm
Counter's Efficiency:	5.62 +/- 0.13 cpm/pCi of Rn-222
Reagent Blank:	0.03 +/- 0.01 pCi

(2) 80% recovery is assumed, based on past experience.
(3) For propagating the uncertainties, 5% of the %-recovery was used as an estimate of its standard deviation.

REVIEWED/APPROVED: D. Cress
Dianne Cress, Analyst

DATE: Aug 1, 1986
Book: Ra26 # 40, p. 70

REMARKS

- Uncertainties are expressed as +/- one standard deviation.
- Small negative or positive results, which are <= two standard deviations, should be interpreted as including "zero"; as "not detected"; or as "less than twice the standard deviation".

Pb-210 RESULTS FOR RC-86-286

Analsyt: AB Pb-210 Log Book # 11 , p. 44 Date 8-4-86

Pb-210 ACTIVITY: .83 +/- 1.47; 1.49 pCi/L

RESULTS CALCULATED FROM:
Sample volume: 500 ml
Bi-carr'r used: 1 ml 100% yield of 84.25 ug of
which 39.25 were recovered for a yield of 46.59 +/- 2.33 %
(sigma assigned as 5% of Bi recovery)

Bi-210 decay began on 860205 at 1230 MST

using:
0.8356 +/- 0.0225 cpm as BKG
0.3920 +/- 0.0050 cpm/dpm as Bi-210 Efficiency
0.3500 +/- 0.1200 pCi as reagent blank

Bi-210 Counting Data:

PT#	YY0DDD	HHMM	GROSS COUNTS	CNT TIME INT
1	860206	0453	52	40
2	860206	1920	42	40
3	860207	0911	49	40
4	860207	2301	47	40
5	860208	1252	32	40
6	860209	0243	35	40
7	860209	1721	37	40
8	860210	0712	43	40
9	860210	2103	46	40
10	860211	1053	53	40
11	860212	0151	34	40
12	860212	1542	44	40
13	860213	0532	37	40

REPORT TO: STEVEN J. CARY
Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

LAB NUMBER RC6 288
DATE RECEIVED 7-11-86
DATE REPORTED
Initials
SLD USER CODE NUMBER 53400

Well Location Address WESTERN NUCLEAR ~~SJI~~ MINE SITE
Point of Collection UPGRADIENT ARROYO SEDIMENT
Well Owner/User —
Number of People Drinking Water from Well —

Collected 7/10/86 (Date) 0937 (Time) By Gary Rawlings (Name) EID (Agency)

Well Depth —
Water Level —

pH
Conductivity (Uncorrected) umho/cm
Temperature °C
Conductivity at 25°C umho/cm

Taste? Odor? Color? Collectors Remarks
From drainage above the spoils pile
Scintillometer Reading - 15 μR/hr

PROJECT:

From ____, A-H_2SO_4 Sample:

- ☐ Nitrate-N+ Nitrite-N ____ mg/l ____
- ☐ Ammonia-N ____ mg/l ____
- ☐ Chemical oxygen demand ____ mg/l ____
- ☐ ____ ____ ____

From ____, A-HNO_3 Sample:

- ☐ ICAP Scan
- ☐ Metals by AA (Specify)

From ____, NA Sample: (Date Analyzed)

- ☐ Calcium ____ mg/l ____
- ☐ Potassium ____ mg/l ____
- ☐ Magnesium ____ mg/l ____
- ☐ Sodium ____ mg/l ____
- ☐ Bicarbonate ____ mg/l ____
- ☐ Chloride ____ mg/l ____
- ☐ Sulfate ____ mg/l ____
- ☐ Total Solids ____ mg/l ____
- ☐ ____ ____

U
Th-230
Ra-226
Po-210
Pb-210
Gamma Spectroscopy

RECEIVED
AUG - 8 1986
LIQUID WASTE/GROUND WATER SURVEILLANCE

This form accompanies 2 of 3 sample(s) marked as follows to indicate field treatment:

NF: Whole sample (no filtration)
F: Filtered in field with 0.45u membrane filter
A-H_2SO_4: Acidified with 2 ml conc-H_2SO_4/l
A-HNO_3: Acidified with 5ml conc HNO_3/l
NA: No acid added

SAMPLE: RC-86-0288

LOW ENERGY GAMMA SPECTROSCOPY REPORT

		pCi/Nuclide/Gram *
Uranium-Radium Series		
A.	U-238	1.7 +/- 0.4
B.	U-234	(Not measured)
C.	Th-230	NOT VISIBLE
D.	Ra-226	2.8 +/- 0.6
E.	Pb-210	3.7 +/- 0.7
F.	Po-210	(Not measured)
Uranium-Actinium Series		
A.	U-235	0.18 +/- 0.04
	Ratio U-235/U-238 =	11. +/- 3. %
B.	Pa-231	NOT VISIBLE
C.	Ac-227	NOT VISIBLE
Thorium Series		
A.	Th-232	(Not measured)
B.	Ra-228	1.1 +/- 0.3
C.	Th-228	0.89 +/- 0.16

* Uncertainties listed are counting statistics plus 15% Procedural/Methodology uncertainty.

Reviewed by C. H. Hayes Date 7-31-86

C. H. Hayes, Analyst, Radiochemistry-SLD

REPORT TO: Steven J. Cary
Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

LAB NUMBER RC6 284
DATE RECEIVED 7-11-86
DATE REPORTED
SLD USER CODE NUMBER (Initials) 53400

Well Location Address Western Nuclear Mine Site
Point of Collection Background Soil
Well Owner/User —
Number of People Drinking Water from Well —
Collected 7/10/86 (Date) 0946 (Time) By Gary Rawlings (Name) EID (Agency)
Well Depth —
Water Level —
pH
Conductivity (Uncorrected) umho/cm
Temperature °C
Conductivity at 25°C umho/cm

Taste? Odor? Color? Collectors Remarks
Scintillometer Reading - 10 uR/hr.

PROJECT:

From ____, A-H_2SO_4 Sample:

☐ Nitrate-N^+ Nitrite-N	mg/l		
☐ Ammonia-N	mg/l		
☐ Chemical oxygen demand	mg/l		
☐			

From ____, A-HNO_3 Sample:

☐ ICAP Scan
☐ Metals by AA (Specify)

From ____, NA Sample:

	Date Analyzed
☐ Calcium mg/l	
☐ Potassium mg/l	
☐ Magnesium mg/l	
☐ Sodium mg/l	
☐ Bicarbonate mg/l	
☐ Chloride mg/l	
☐ Sulfate mg/l	
☐ Total Solids mg/l	
☐	

☐ U
☐ Th-230
☐ Ra-226
☐ Po-210
☐ Pb-210
} Gamma Spectroscopy

RECEIVED
AUG - 8 1986
LIQUID WASTE/GROUND WATER SURVEILLANCE

This form accompanies 2 x for 7 sample(s) marked as follows to indicate field treatment:

NF: Whole sample (no filtration)
F: Filtered in field with 0.45u membrane filter
A-H_2SO_4: Acidified with 2 ml conc H_2SO_4/l
A-HNO_3: Acidified with 5ml conc HNO_3/l
NA: No acid added

SAMPLE: RC-86-0289

LOW ENERGY GAMMA SPECTROSCOPY REPORT

		pCi/Nuclide/Gram *
Uranium-Radium Series		
A.	U-238	1.5 +/- 0.4
B.	U-234	(Not measured)
C.	Th-230	NOT VISIBLE
D.	Ra-226	1.2 +/- 0.3
E.	Pb-210	3.6 +/- 0.7
F.	Po-210	(Not measured)
Uranium-Actinium Series		
A.	U-235	0.08 +/- 0.02
	Ratio U-235/U-238 =	5.3 +/- 1.7 %
B.	Pa-231	NOT VISIBLE
C.	Ac-227	NOT VISIBLE
Thorium Series		
A.	Th-232	(Not measured)
B.	Ra-228	1.1 +/- 0.4
C.	Th-228	0.92 +/- 0.16

* Uncertainties listed are counting statistics plus 15% Procedural/Methodology uncertainty.

Reviewed by C. H. Hayes Date 7-31-86

C. H. Hayes, Analyst, Radiochemistry-SLD

REPORT TO: Steven J. Cary
Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

LAB NUMBER HC 6 293
DATE RECEIVED 7-11-86
DATE REPORTED
Initials
SLD USER CODE NUMBER 53400

Well Location Address Western Nuclear Mine Site
Point of Collection Western Arroyo - Sediment
Well Owner/User
Number of People Drinking Water from Well
Collected 7/10/86 (Date) 1038 (Time) By Cary/Rawings (Name) EID (Agency)
Well Depth
Water Level
pH
Conductivity (Uncorrected) umho/cm
Taste? Odor? Color? Collectors Remarks
From arroyo collecting spoils pile run-off. Scintillometer Reading-20 uR/hr.
Temperature °C
Conductivity at 25°C umho/cm

PROJECT:

From ____, A-H_2SO_4 Sample:

☐ Nitrate-N+ Nitrite-N	mg/l		
☐ Ammonia-N	mg/l		
☐ Chemical oxygen demand	mg/l		
☐			

From ____, A-HNO_3 Sample:

☐ ICAP Scan
☐ Metals by AA (Specify)

From ____, NA Sample:

			Date Analyzed
☐ Calcium	mg/l		
☐ Potassium	mg/l		
☐ Magnesium	mg/l		
☐ Sodium	mg/l		
☐ Bicarbonate	mg/l		
☐ Chloride	mg/l		
☐ Sulfate	mg/l		
☐ Total Solids	mg/l		
☐			

4 Th-230, Ra-226, Pb-210, Pb-210 } Gamma Spectroscopy

RECEIVED
AUG 8 1986
LIQUID WASTE SURVEILLANCE

This form accompanies 2x603 sample(s) marked as follows to indicate field treatment:

NF: Whole sample (no filtration)
F: Filtered in field with 0.45u membrane filter
A-H_2SO_4: Acidified with 2-ml conc H_2SO_4/l
A-HNO_3: Acidified with 5ml conc HNO_3/l
NA: No acid added

SAMPLE: RC-86-0293

LOW ENERGY GAMMA SPECTROSCOPY REPORT

		pCi/Nuclide/Gram *
Uranium-Radium Series		
A.	U-238	1.3 +/- 0.4
B.	U-234	(Not measured)
C.	Th-230	NOT VISIBLE
D.	Ra-226	1.8 +/- 0.3
E.	Pb-210	1.8 +/- 0.4
F.	Po-210	(Not measured)
Uranium-Actinium Series		
A.	U-235	0.11 +/- 0.02
	Ratio U-235/U-238 =	8.3 +/- 2.6 %
B.	Pa-231	-0.65 +/- 0.99
C.	Ac-227	NOT VISIBLE
Thorium Series		
A.	Th-232	(Not measured)
B.	Ra-228	1.8 +/- 0.4
C.	Th-228	1.8 +/- 0.3

* Uncertainties listed are counting statistics plus 15% Procedural/Methodology uncertainty.

Reviewed by C. H. Hayes Date 7-31-86

C. H. Hayes, Analyst, Radiochemistry-SLD

REPORT TO: Steven J. Cary
Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

LAB NUMBER RC6 291
DATE RECEIVED 7-11-86
DATE REPORTED
Initials
SLD USER CODE NUMBER 53400

Well Location Address WESTERN NUCLEAR MINE SITE
Point of Collection Mine Spoils - North Slope of Pile
Well Owner/User —
Number of People Drinking Water from Well —
Collected 7/10/86 (Date) 1026 (Time) By Gary Rawlings (Name) EID (Agency)
Well Depth —
Water Level —
pH
Conductivity (Uncorrected) umho/cm
Temperature °C
Conductivity at 25°C umho/cm

Taste? Odor? Color? Collectors Remarks
Mine spoils exposed by erosion & ~~reclamat~~ cover soil
Scintillometer Reading - 110 μR/hr

PROJECT:

From ____, A-H_2SO_4 Sample:

			Date Analyzed
☐ Nitrate-N^+ Nitrite-N		mg/l	
☐ Ammonia-N		mg/l	
☐ Chemical oxygen demand		mg/l	
☐			

From ____, NA Sample:

			Date Analyzed
☐ Calcium		mg/l	
☐ Potassium		mg/l	
☐ Magnesium		mg/l	
☐ Sodium		mg/l	
☐ Bicarbonate		mg/l	
☐ Chloride		mg/l	
☐ Sulfate		mg/l	
☐ Total Solids		mg/l	
☐			

From ____, A-HNO_3 Sample: U
☐ ICAP Scan
☐ Metals by AA (Specify)
Th-230
Ra-226
Po-210
Pb-210
} Gamma Spectroscopy

RECEIVED
AUG - 8 1986
LIQUID WASTE/GROUND WATER SURVEILLANCE

This form accompanies 2 soil sample(s) marked as follows to indicate field treatment:
NF: Whole sample (no filtration)
F: Filtered in field with 0.45u membrane filter
A-H_2SO_4: Acidified with 2 ml conc H_2SO_4/l
A-HNO_3: Acidified with 5ml conc HNO_3/l
NA: No acid added

Chain-of-Custody

- ☐ Cyanide
- ☐ Heavy Metals - ICAP
- ☐ Organics
  - ☐ VOC
  - ☐ PCB & Pesticide
  - ☐ Extractable PNA
- ☒ Radiology
  - ☒ Pb-210
  - ☒ U isotopes
  - ☒ Th
  - ☒ Gross alpha
  - ☒ Gross Beta
  - ☒ Ra 226 & Ra 228
  - ☒ Po

SAMPLE NUMBERS	MATRIX	# containers
850516 1220	SOIL	1-8oz
~~850516 1525~~	~~SOIL~~	~~1-8oz~~

RELINQUISHED BY: Robert McGarry DATE: 5-17-85

RECEIVED IN LAB BY: J. L. Zwick TIME: 1403

SAMPLE: RC-86-0291

LOW ENERGY GAMMA SPECTROSCOPY REPORT

		pCi/Nuclide/Gram *
Uranium-Radium Series		
A.	U-238	22. +/- 3.
B.	U-234	(Not measured)
C.	Th-230	40. +/- 10.
D.	Ra-226	38. +/- 6.
E.	Pb-210	42. +/- 6.
F.	Po-210	(Not measured)
Uranium-Actinium Series		
A.	U-235	1.9 +/- 0.3
	Ratio U-235/U-238 =	8.5 +/- 0.8 %
B.	Pa-231	1.4 +/- 0.8
C.	Ac-227	1.9 +/- 0.4
Thorium Series		
A.	Th-232	(Not measured)
B.	Ra-228	NOT VISIBLE
C.	Th-228	0.62 +/- 0.11

* Uncertainties listed are counting statistics plus 15% Procedural/Methodology uncertainty.

Reviewed by C. H. Hayes Date 7-31-86

C. H. Hayes, Analyst, Radiochemistry-SLAD

RECEIVED

AUG - 8 1986

LIQUID WASTE, GROUND WATER SURVEILLANCE

REPORT TO: Steven J. Cary
Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

LAB NUMBER MC6 290
DATE RECEIVED 7-11-86
DATE REPORTED
Initials
SLD USER CODE NUMBER 53400

Well Location Address Western Nuclear Mine Site
Point of Collection Cover Soil - From Middle of pile at Top of Slope
Well Owner/User
Number of People Drinking Water from Well
Collected 7/10/86 1026 By Cary Rawlings EID
Date Time Name Agency

Well Depth
Water Level

pH
Conductivity (Uncorrected) umho/cm
Temperature °C
Conductivity at 25°C umho/cm

Taste? Odor? Color? Collectors Remarks
Scintillometer Reading -35 uR/hr

PROJECT:

From ____, A-H_2SO_4 Sample:

- ☐ Nitrate-N^+ Nitrite-N ____ mg/l ____
- ☐ Ammonia-N ____ mg/l ____
- ☐ Chemical oxygen demand ____ mg/l ____
- ☐ ____ ____ ____

From ____, A-HNO_3 Sample:

- ☐ ICAP Scan
- ☐ Metals by AA (Specify)

From ____, NA Sample:

Date Analyzed

- ☐ Calcium ____ mg/l ____
- ☐ Potassium ____ mg/l ____
- ☐ Magnesium ____ mg/l ____
- ☐ Sodium ____ mg/l ____
- ☐ Bicarbonate ____ mg/l ____
- ☐ Chloride ____ mg/l ____
- ☐ Sulfate ____ mg/l ____
- ☐ Total Solids ____ mg/l ____
- ☐ ____ ____

U
Th-230
Ra-226
Po-210
Pb-210
} Gamma Spectroscopy

RECEIVED
AUG - 8 1986
LIQUID WASTE/GROUND WATER SURVEILLANCE

This form accompanies 2 x 8 x 3 sample(s) marked as follows to indicate field treatment:

- NF: Whole sample (no filtration)
- F: Filtered in field with 0.45u membrane filter
- A-H_2SO_4: Acidified with 2 ml conc H_2SO_4/l
- A-HNO_3: Acidified with 5ml conc HNO_3/l
- NA: No acid added

SAMPLE: RC-86-0290

LOW ENERGY GAMMA SPECTROSCOPY REPORT

		pCi/Nuclide/Gram *
Uranium-Radium Series		
A.	U-238	2.4 +/- 0.5
B.	U-234	(Not measured)
C.	Th-230	NOT VISIBLE
D.	Ra-226	2.2 +/- 0.4
E.	Pb-210	2.4 +/- 0.5
F.	Po-210	(Not measured)
Uranium-Actinium Series		
A.	U-235	0.12 +/- 0.02
	Ratio U-235/U-238 = 5.0 +/- 0.8 %	
B.	Pa-231	0.43 +/- 0.38
C.	Ac-227	0.50 +/- 0.18
Thorium Series		
A.	Th-232	(Not measured)
B.	Ra-228	1.6 +/- 0.5
C.	Th-228	1.4 +/- 0.2

* Uncertainties listed are counting statistics plus 15% Procedural/Methodology uncertainty.

Reviewed by C. H. Hayes Date 7-31-86

C. H. Hayes, Analyst, Radiochemistry-SLD

Ground Water & Hazardous Waste Bureau
Environmental Improvement Division
Health & Environment Department
P.O. Box 968 - Crown Building
Santa Fe, NM 87504-0968

DATE RECEIVED 7-11-86
DATE REPORTED 4-Aug-86
Initials
SLD USER CODE NUMBER 53400

Well Location Address WESTERN NUCLEAR SITE
Point of Collection WINDMILL - approx. 4 mile NE of site
Well Owner/User
Number of People Drinking Water from Well STOCK mainly
Collected 7/10/86 (Date) 1123 (Time) By Gary Rawlings (Name) EID (Agency)
Well Depth Unknown
Water Level Unknown
Taste? Odor? Color? Collectors Remarks
No odour or colour

pH —
Conductivity (Uncorrected) — umho/cm
Temperature — °C
Conductivity at 25°C — umho/cm

PROJECT:

From ____, A-H_2SO_4 Sample:

- ☐ Nitrate-N^+ Nitrite-N ____ mg/l ____
- ☐ Ammonia-N ____ mg/l ____
- ☐ Chemical oxygen demand ____ mg/l ____
- ☐ ____ ____ ____

From 1 l., A-HNO_3 Sample:

- ☐ ~~ICAP Scan~~
- ☐ ~~Metals by AA (Specify)~~ U Th-230 Ra-226 ~~Pb-210~~ Pb-210

From ____, NA Sample:

		Date Analyzed
☐ Calcium	____ mg/l	____
☐ Potassium	____ mg/l	____
☐ Magnesium	____ mg/l	____
☐ Sodium	____ mg/l	____
☐ Bicarbonate	____ mg/l	____
☐ Chloride	____ mg/l	____
☐ Sulfate	____ mg/l	____
☐ Total Solids	____ mg/l	____
☐ ____	____	____

Wet Chemistry See Attached

RECEIVED
AUG 1986

This form accompanies 1 x 1l. sample(s) marked as follows to indicate field treatment:

- NF: Whole sample (no filtration)
- F: Filtered in field with 0.45u membrane filter
- A-H_2SO_4: Acidified with 2 ml conc H_2SO_4/l
- A-HNO_3: Acidified with 5ml conc HNO_3/l
- NA: No acid added

URANIUM, ISOTOPIC

SAMPLE TYPE: WATER

SAMPLE #: RC-86 0287

ANALYZED: 18-JUL-86 through 23-JUL-86
CALCULATED: 23-JUL-86

|*| USER or | | QC: | | Known | | Blank | | Spike | | Rep.

METHOD: SLD's RC determination of Uranium by sequential separation and alpha counting methods.

SAMPLE (Size & Description): 0.9000 LITER of the user's sample which was modified at SLD by a pre-analytical treatment.

RESULTS:

Isotope		Activity		
U-234	=	14.084 +-	0.664	pCi/LITER
U-235	=	0.427 +-	0.022	pCi/LITER
U-238	=	9.227 +-	0.475	pCi/LITER
Sum	=	23.739 +-	0.884	pCi/LITER

Analytical Blanks Of:
0.260 +/- 0.060 pCi/Anal. for U-234, and
0.140 +/- 0.040 pCi/Anal. for U-238 were used in the calculation of the results.

U-232 Tracer Usage:
100.0 UL @ 0.086 +/- 0.001 pCi/UL = 8.60 +/- 0.10 pCi Added.
Tracer Batch: FEB-84 U I Calibrated: FEB-84
Chemical & Counting Efficiency: 0.264 cps/dps

Counting Data Summary:

	U-238 (cps)	U-234 (cps)	U-232 (cps)
Sample Gross:	0.08260 +/- 0.00287	0.12660 +/- 0.00356	0.08410 +/- 0.00290
Sample Bks:	0.00002 +/- 0.00002	0.00010 +/- 0.00004	0.00000 +/- 0.00000
Sample Net:	0.08258 +/- 0.00287	0.12650 +/- 0.00356	0.08410 +/- 0.00290
Ratio: U-234 / U-238		1.532 +/- 0.069	

REVIEWED/APPROVED: J C Lusk DATE: 23 July 86
JC LUSK, Analyst Book: U # 8 P. 74

REMARKS

- Uncertainties are expressed as +/- one standard deviation.
- Small negative or positive results, which are <= two standard deviations, should be interpreted as including 'zero'; as 'not detected'; or as 'less than twice the standard deviation'.
- Reported U-235 result is a calculated value based on the measured U-238 content, i.e. U-235 = 4.63% of the measured U-238 result.

THORIUM - 230

SAMPLE TYPE: WATER

SAMPLE #: RC-86 0287

ANALYZED: 18-JUL-86 through 23-JUL-86
CALCULATED: 23-JUL-86 08:03

|#| USER or | | QC: | | Known | | Blank
| |Spike | | Rep.

METHOD: SLD's RC determination of Thorium by sequential separation and alpha counting methods.

SAMPLE (Size & Description): 0.9000 LITER of the user's sample which was modified at SLD by a pre-analytical treatment.

RESULTS:

Isotope		Activity
Th-230	=	0.047 +- 0.106 pCi/LITER

Analytical Blanks Of:
0.280 +/- 0.070 pCi/Anal. for Th-230 was the blank used in the calculation of the result.

Th-230 Reference Sample:
50.0 uL of OCT-84 TH I Th-230 known solution at 1.520 +- 0.040 pCi/uL = 76.000 +- 2.00 pCi of Th-230 as the reference activity.

Th-234 Tracer Usage:
100.0 uL of 15-MAY-86 's tracer were added to the sample and 22.88 +- 0.34 cps were recovered.
100.0 uL of 15-MAY-86 's tracer were added to the reference and 24.83 +- 0.35 cps were recovered.
Recovery Ratio as Sample/Reference: 0.92

Counting Data Summary:

	Sample Th-230 (cps)		Reference Th-230 (cps)	
Gross:	0.00280 +/-	0.00053	0.69060 +/-	0.00831
Bkg:	0.00010 +/-	0.00004	0.00010 +/-	0.00004
Net:	0.00270 +/-	0.00053	0.69050 +/-	0.00831

REVIEWED/APPROVED: J C Lusk DATE: 29 July 86
JCLUSK, Analyst Book: Th # 8 p. 14

REMARKS

- Uncertainties are expressed as +/- one standard deviation.
- Small negative or positive results, which are <= two standard deviations, should be interpreted as including 'zero'; as 'not detected'; or as 'less than twice the standard deviation'.

Ra-226 ANALYSIS

SAMPLE TYPE: WATER, filtered

SAMPLE #: RC-86-287 -00

ANALYZED: 22-JUL-86 through 29-JUL-86
CALCULATED: 29-JUL-86 14:16

|*| USER or | | QC: | | Known | | Blank
| | Spike | | Rep.

METHOD: SLD RC Sequential

SAMPLE (Size & Description): 0.9000 Liter of the user's sample which was modified at SLD by a pre-analytical treatment.

RESULTS:

Isotope		Activity	Detection Limit
Ra-226	=	0.044 +- 0.020 pCi/Liter	

DATE	TIME (MST)	MIN FROM T(sep)	
22-JUL-86	13:51	-8307.	Bubbler purged....Rn-222 ingrowth begins.
28-JUL-86	8:18	0.	Bubbler harvested by emanation to Lucas cell....Rn-222 ingrowth ends. Daughters of Rn-222 begin their ingrowth. Lucas cell placed in counting chamber for dark adjustment.
28-JUL-86	12:48	270.	Start of counting period.

Gross Counts	Counting Period	Gross cpm
1098.	1094.	1.004

29-JUL-86	7:02	1364.	End of counting period....Analysis completed.

CALCULATIONS:

Decay-corrected Net Activity at T(sep):	0.206 +/- 0.038 cpm
Apply Counter's Efficiency:	0.036 +/- 0.007 pCi
Apply Rn-222 Ingrowth Factor:	0.056 +/- 0.010 pCi
Divide by Chemical Yield:	0.069 +/- 0.013 pCi
Subtract Reagent Blank:	0.039 +/- 0.016 pCi
Divide by Analytical Sample Size:	0.044 +/- 0.020 pCi/Liter

Using:

Chemical Yield(2):	80.0 +/- 4.0 % Recovery
Rn-222 Ingrowth:	64.7 % of Equilibrium
Counter's Background:	0.817 +/- 0.016 cpm
Counter's Efficiency:	5.72 +/- 0.14 cpm/pCi of Rn-222
Reagent Blank:	0.03 +/- 0.01 pCi

(2) 80% recovery is assumed, based on past experience.
(3) For propagating the uncertainties, 5% of the %-recovery was used as an estimate of its standard deviation.

REVIEWED/APPROVED: D. Cress
Dianne Cress, Analyst

DATE: July 30, 1986
Book: Ra26 # 40, p. 67

REMARKS

- Uncertainties are expressed as +/- one standard deviation.
- Small negative or positive results, which are <= two standard deviations, should be interpreted as including "zero"; as "not detected"; or as "less than twice the standard deviation".

Pb-210 RESULTS FOR RC-86-0287

Analsyt: AB Pb-210 Log Book # 11 , p. 37 Date 7-30-86

Pb-210 ACTIVITY: .64 +/- .76; .78 pCi/L

RESULTS CALCULATED FROM:
Sample volume: 900 ml
Bi-carr'r used: 1 ml 100% yield of 84.92 ug of
which 67.50 were recovered for a yield of 79.49 +/- 3.97 %
(sigma assigned as 5% of Bi recovery)

Bi-210 decay began on 860203 at 1225 MST

using:
0.8060 +/- 0.0222 cpm as BKG
0.3920 +/- 0.0050 cpm/dpm as Bi-210 Efficiency
0.3500 +/- 0.1200 pCi as reagent blank

Bi-210 Counting Data:

PT#	YY0DDD	HHMM	GROSS COUNTS	CNT TIME INT
1	860204	0450	91	40
2	860204	1951	100	40
3	860205	0942	98	40
4	860205	2034	78	40
5	860206	1101	87	40
6	860207	0051	81	40
7	860207	1442	86	40
8	860208	0433	89	40
9	860208	1824	105	40
10	860209	0902	90	40
11	860209	2253	95	40
12	860210	1243	64	40
13	860211	0234	74	40

REPORT TO: Water Pollution Control Bureau
Environmental Improvement Division
Health & Environment Department
P. O. Box 968 - Crown Building
Santa Fe, NM 87503
ATTENTION: Langhorst

RECEIVED
DEC 20 1984

LAB NUMBER A(°-11-11-51
DATE RECEIVED 11-14-84
DATE REPORTED 13-Dec-84 JBerge
Initials

GROUND WATER/HAZARDOUS WASTE BUREAU

WATER OR WASTEWATER ANALYSES-ENERGY DEVELOPMENT MONITORING PROGRAM

Sample Location: Section 21 Mine (Western Nuclear)
Smith Lake - Soil sample

Lat/Long ° ' "; ° ' " T 15N R 13W S 21

Station/Well Code _____ NPDES No _____ Outfall No _____

Collected 840911 (Date) _____ (Time) By Tommy K Begay Jr (Name) _____ (Unit)

Pumping Conditions _____

Water Level _____

Staff Gage Height _____

Control Structure _____

Discharge _____

Sample Type _____

pH (00400) (soil) 5.67
Eh = +240mv

Conductivity (Uncorrected) _____ µmho

Water Temp (00010) _____ °C

Conductivity at 25°C (00094) _____ µmho

RADIOCHEMISTRY

From F, A-HNO_3 sample: Soil digestion

			Date Analyzed
☑ Gross alpha, ~~dissolved~~ (Rel. to U-238)	830	± 90 @ 1σ level pCi/g	
☑ Radium-226, ~~dissolved~~ (radon eman)	90	± 15 @ 1σ level pCi/g	
☑ Radium-228, ~~dissolved~~	3	± 1 @ 1σ level pCi/g	
☑ Lead-210, ~~dissolved~~	160	± 15 @ 1σ level pCi/g	

From NF, A-HNO_3 sample:

☐ Gross alpha, total (Rel to U-238)		± pCi/l	
☐ Radium-226, total		± pCi/l	
☐ Radium-228, total		± pCi/l	
☐ Lead-210, total		± pCi/l	

Remarks U-238: 98 ± 10 pCi/g w/ ± being @ 1σ level
U-234: 96 ± 10 pCi/g "
Ratio (U-234/U-238): 0.99 ± 0.04 "
Th-230: 105 ± 10 pCi/g "

This form accompanies 1 sample(s) marked as follows to indicate field treatment (circle):

NF, A-HNO_3: Whole sample; acidified with 5 ml conc HNO_3/l
F, A-HNO_3: Filtered sample (0.45µ membrane filter); acidified with 5 ml conc

State of New Mexico
HEALTH and ENVIRONMENT DEPARTMENT
SCIENTIFIC
LABORATORY DIVISION

CHEMICAL and PHYSICAL ANALYSES for WATER SAMPLES

Date received: 5/17/85 | Lab No.: RC-85-153 | SLD user code No.: RML

CONSULT SLD Lab Annex L for proper presentation of sample(s). TYPE or PRINT with Ball Point Pen

CHEMICAL ANALYSES: *Check individual items for analysis [Mark appropriate box(es)]*

INTERIM PRIMARY PARAMETER GROUP: ☐ 1 ☐ 2 ☐ 3

TYPE of CHEMICAL ANALYSIS: ☐ Complete Secondary ☐ Organic ☒ Radiological

Water Supply System Name	Water Supply System Code No.	City or Location	County	Check one:
Western Nuclear	8505161220	Smith Lake	Cibola	☐ TREATED WATER ☐ RAW WATER

Collection Date	Collection Time	Collection Point	Collector's remarks	Report to
5-16-85	1220	Toe of Spoils Pile	(RADIOACTIVE - HOT SPOILS) Sample of spoils that are being covered	R.M. LOWY - NMEID

Collected By	Owner	Address
LOWY/RAWLINGS	Western Nuclear	GW/HW Bureau PO Box 968 Santa Fe, NM 87504-0968

TYPE of SYSTEM (Check one): ☐ PRIVATE PUBLIC: ☐ Community ☐ Non-community

SOURCE: ☐ Spring ☐ Lake ☐ Well-Depth ☐ Drain ☐ Stream ☐ Pool ☐ Other (specify)

LAT. ° ' "

LONG ° ' "

CATIONS	mg/l	ANIONS	mg/l	PHYSICAL	mg/l	HEAVY METALS	mg/l
00930 Sodium (as Na)		00940 Chloride (as Cl)		70300 Total Filterable Residue		01000 Arsenic	
00935 Potassium (as K)		00950 Fluoride (as F)		38260 Foaming Agents (as Las)		01005 Barium	
00900 Tot. Hardness (as $CaCO_3$)		00620 Nitrate (as N)		00095 Conductance Micromhos 25°C		01025 Cadmium	
00915 Calcium (as Ca)		00430 Alkalinity (as $CaCO_3$)		00400 pH		01030 Chromium	
00925 Magnesium (as Mg)		00440 Bicarbonate (as HCO_3)		01330 Odor		01049 Lead	
01045 Iron-Total (as Fe)		00445 Carbonate (as CO_3)		00080 Color		01075 Silver / 71900 Mercury	
01056 Manganese (as Mn)		00945 Sulfate (as SO_4)		00070 Turbidity		01145 Selenium	

RECEIVED
JUN 24 1985
LIQUID WASTE/GROUND WATER SURVEILLANCE

PARAMETER		ORGANIC	mg/l
☒ Pb-210	pCi/G 17.8	39390 Endrin	±1.0 @ lo limit
☒ Th-230 ~~(Isotopic)~~	pCi/G 11.8	39732 Lindane	±0.5 @ lo limit
☒ Gross α ~~Th~~ w/Am-241 ref	pCi/G 115	38270 Methoxychlor	±10 @ lo limit
☒ RADIOLOGICAL pCi/G 01501 Gross Alpha w/U-nat ref	190	39400 Toxaphene	±20 @ lo limit
☒ 03501 Gross Beta w/Cs-137 ref	pCi/G 130	39730 2, 4-D	±20 @ lo limit
☒ 09501 Radium-226 (See Note)	pCi/G 6.6	39740 2, 4, 5-TP (Silvex)	±0.4 @ lo limit
☒ ~~11501 Radium-228~~ U-234	pCi/G 13.4		±0.4 @ lo limit
☒ U-238	pCi/G 13.1		±0.4 @ lo limit

NOTE: Ra-226 analysis was troubled by "hot-spots" in that excessive spread of results was obtained (6.3±0.4, 3.8±0.2, 6.0±0.8, 9.0±0.5, 4.7±0.3 & 10.1±0.6) for which the mean w/ typical uncertainty were reported. SBB 18-Jun-85

LABORATORY REMARKS: RELINQUISHED BY : Reported as pCi per gram dry weight!

RECEIVED IN LAB BY :

- No Chain-of-Custody tags, seals or forms on-hand. Use hand-carry and above Chain-of-custody handling instead.

Reviewed by: Loren D. Berge

Date reported: 18-Jun-85

SLD 702 Form Revised 4'78

DISTRIBUTION: White - Water Supply Regulation, SF • Canary - WS System • Pink - EIA Regional Office • Goldenrod - SLD Lab

SAMPLE: RC-86-0292

LOW ENERGY GAMMA SPECTROSCOPY REPORT

		pCi/Nuclide/Gram *
Uranium-Radium Series		
A.	U-238	5.6 +/- 1.0
B.	U-234	(Not measured)
C.	Th-230	14. +/- 4.
D.	Ra-226	6.6 +/- 1.1
E.	Pb-210	8.0 +/- 1.3
F.	Po-210	(Not measured)
Uranium-Actinium Series		
A.	U-235	0.39 +/- 0.07
	Ratio U-235/U-238 =	7.0 +/- 0.9 %
B.	Pa-231	NOT VISIBLE
C.	Ac-227	0.40 +/- 0.12
Thorium Series		
A.	Th-232	(Not measured)
B.	Ra-228	0.49 +/- 0.48
C.	Th-228	1.2 +/- 0.2

* Uncertainties listed are counting statistics plus 15% Procedural/Methodology uncertainty.

Reviewed by C. H. Hayes Date 7-31-86

C. H. Hayes, Analyst, Radiochemistry-SLED

RECEIVED
AUG - 8 1986
LIQUID WASTE/GROUND WATER SURVEILLANCE

July 10, 1986

0825 Weather Fine, Scattered Cloud, 60°F.

— Smith Lake Odometer Reading 802.9
Intersect of St. Hy. 56
and Navajo Rte 49

— Turn South off " " 807.2
Navajo Rte 49 onto
Nav. Rte 491.
— Turn Sth 808.9
— Western Nuc. Site " " 809.2 miles

0905 — Met w. Bobby Lopez EID Radiation
Bureau personnel ~~[illegible]~~ from
Grants District Office at Smith
Lake & proceeded to site.

1.1 mi S on N.R. 491 to windmill & stock
tank

~~Arrived~~

0915 Arrived at Site.

Navajo personnel present
Leison Benally
Gene Little

Vernon Tsosie
Carol Boughton

---

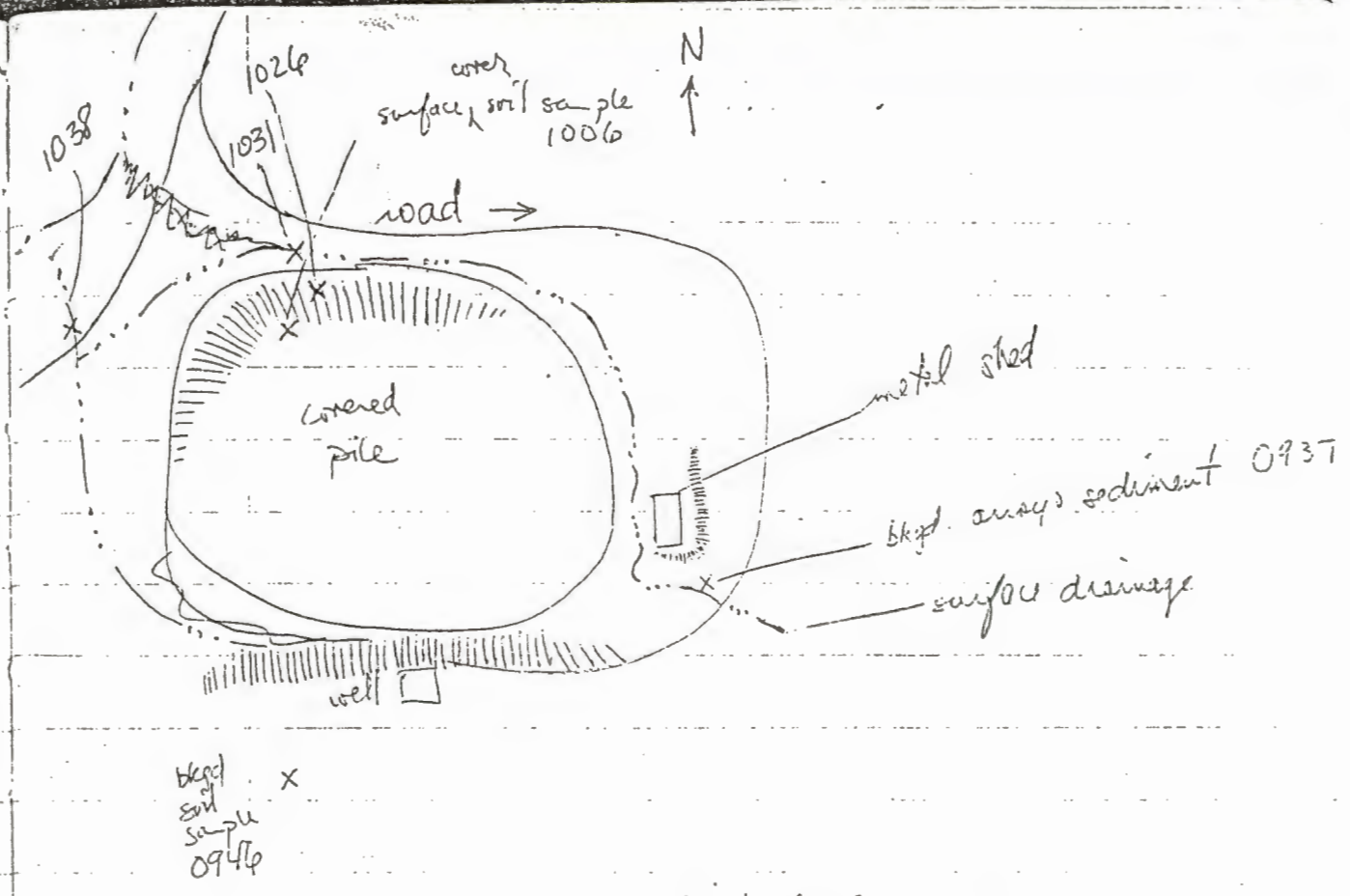
also called Section 27 Mine
arrived @ site @ 9:18, observed covered pile south of access road; pile is graded, good start to vegetation cover, minor rivulets + erosion on north + west faces of pile

0935 walked around east side of site up on hill; identified small headwater drainage uphill from site

0937 collected 2 8-oz soil jars of arroyo sediment.

0946 continued walking to hill south of dump; found on-site well, but tank was dry + no power to pump; collected background soil samples (2 8-oz soil jars).

0955 returned to metal shed on-site to trace out surface drainage paths



covered pile is relatively level; grass had been seeded in rows, doing OK; about 2/3 of ground cover on pile is weeds, however; clear evidence of livestock grazing: grass is clipped, hoof-prints, sheep-droppings; ~~site~~ site not fenced.

site

9	1006	collected sample of surface soil (cover) on NW portion of pile; scintill.: 35 μR/hr @ waist ht., 46 @ ground surface; grass seeding not along contours at all places, sometimes up + down slope; some minor gullying apparent near sample 1006;

1026 collected sample of gray sediment in gully on north side of pile; "mine spoils"; (2 - 8-oz jars); scintill: 110 uR/hr @ waist ht, 170 @ ground surface;

1031 collected sample of arroyo sediment along N side of pile, downstream from sample 1026; (2 8-oz jars); scintill: 27 uR/hr @ waist, 29 @ ground surface;

1038 collected sample of arroyo sediment below confluence of site drainages, west of road; (2 8-oz jars) scintill: 20 @ waist, 23 @ stream bed;

scintill readings @ site 0937 15 uR/hr
@ site 0946 10 uR/hr

Western Nuclear, Inc.
Executive Office, Suite 357, One Park Central
1515 Arapahoe
Denver, CO 80202 (303) 255-0471

c/o Western Nuclear, Inc.
6001 Osuna Rd. NE
Albq. 87109 881-7063

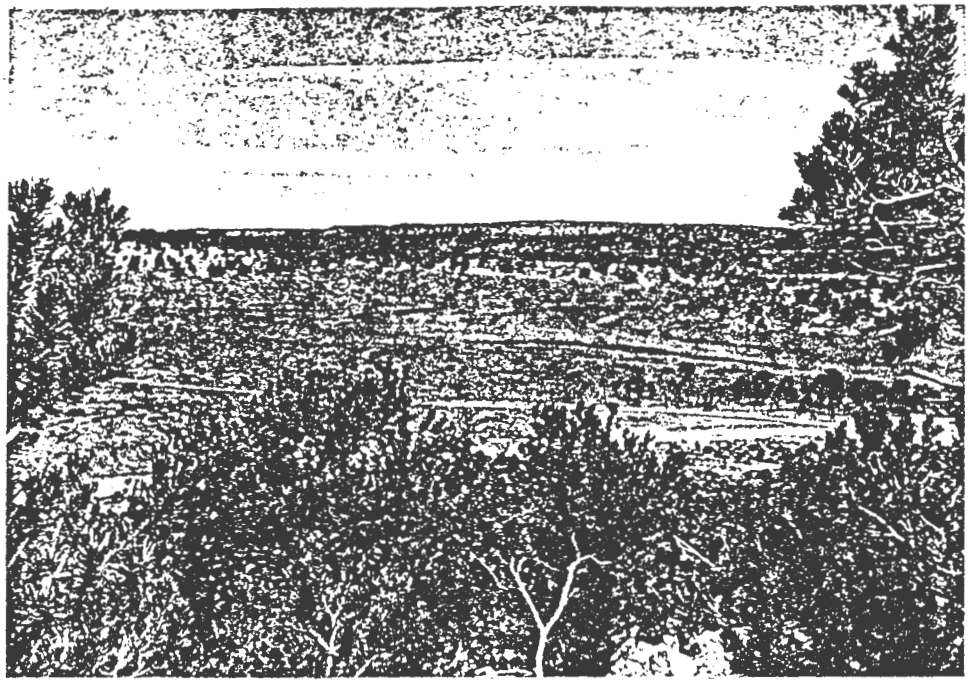
1123 Sampled windmill approx. 1/4 mile NE of site
1L. plastic
Water is used mainly for stock watering

1146 collected water sample from tap at Evelyn Charley residence 1/4 mi SW of site. water comes from well back on road to Smith Lake.

all water samples A-HNO_3

Site: Odom. Read. 811.6
Water Tank " " 814.6
Part of Smith Lake System?

Tank Turn off. 815.0
Intersection N.R. 49 818.6
& St. Hway 56



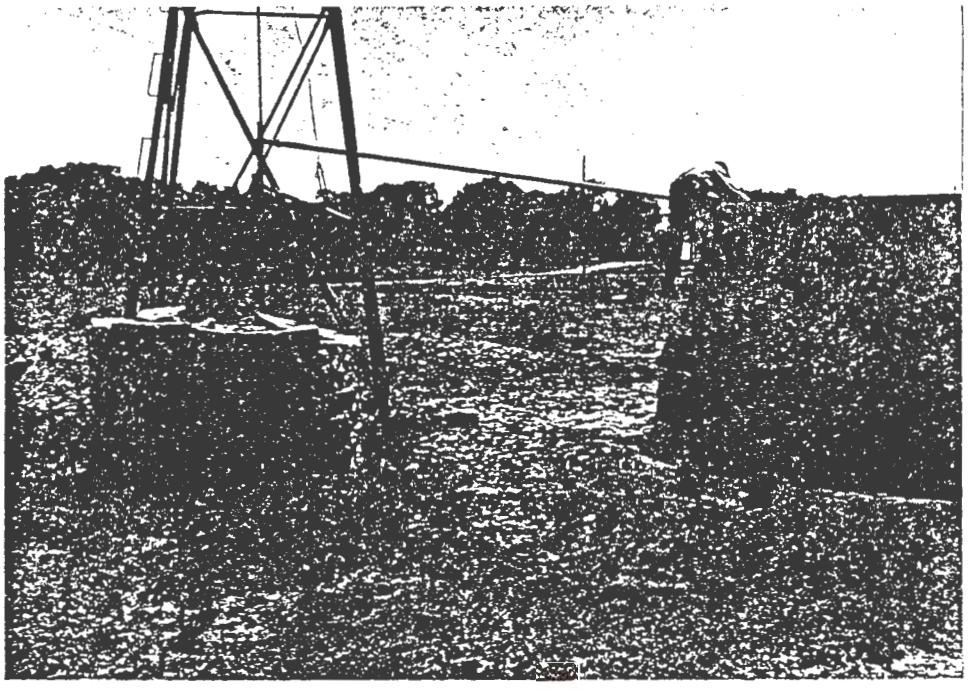
Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 1115 / North-west

Comments: Overview of the drainage path from the site. Taken from a ridge immediately to the north of the site. Waste pile is to the left of the photo.



Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 1123 / South-east

Comments: Steve Cary sampling windmill well located NE of the site.

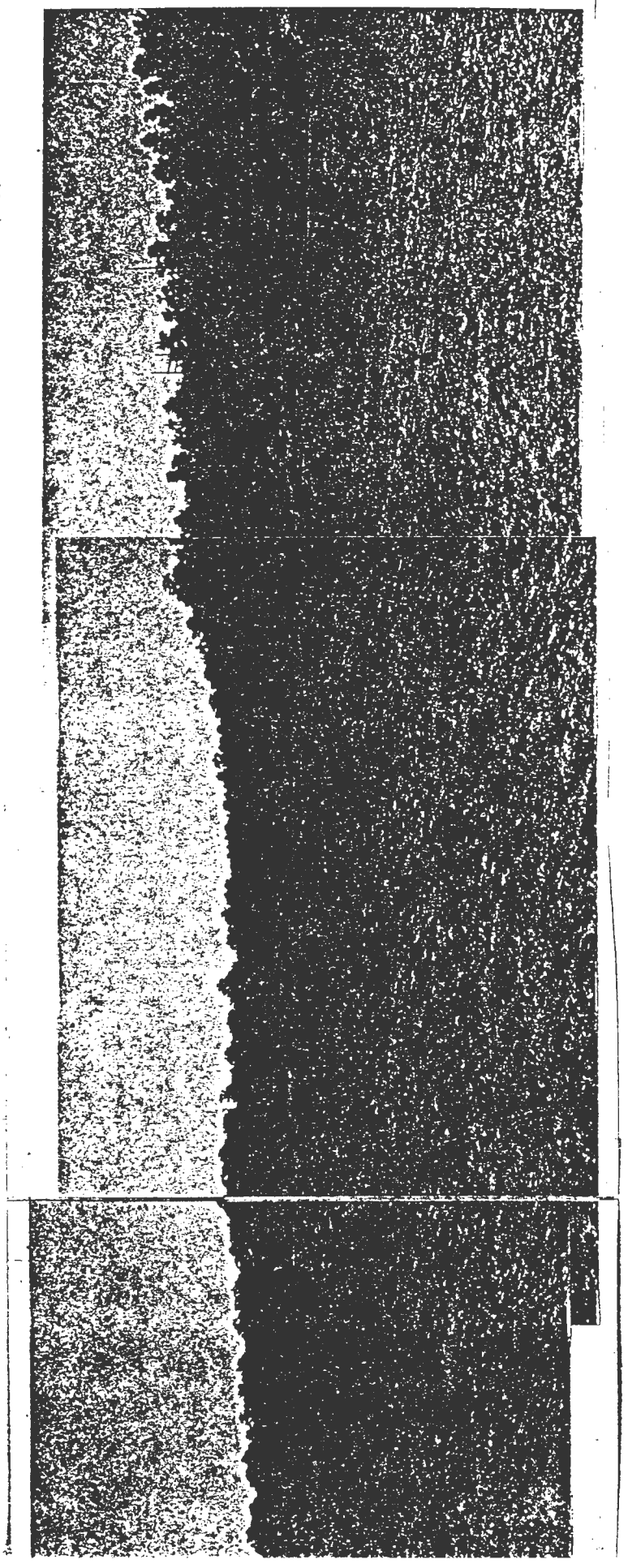
Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 0937 / West.

Comments: Steve Cary collecting background soil sample from an arroyo above and to the east of the site.



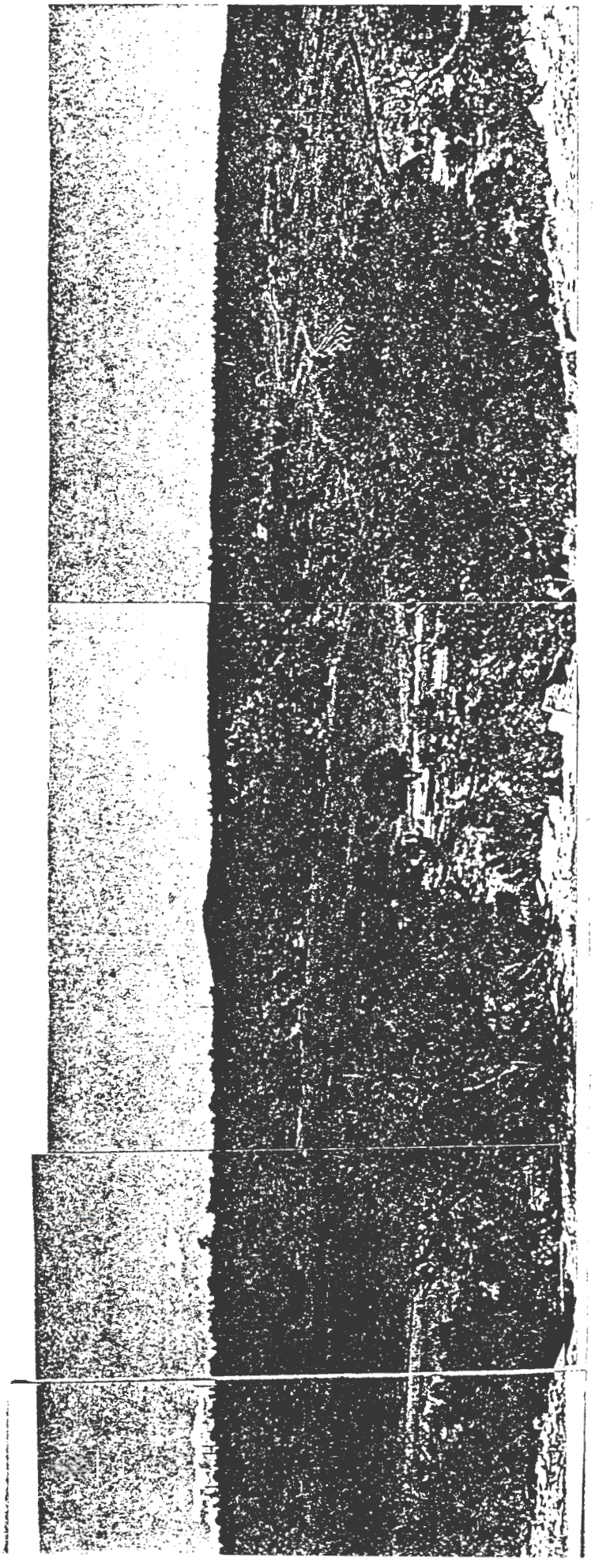
Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 1103 / East

Comments: From the middle of the pile facing east. The only building on-site is at the eastern edge of the pile.



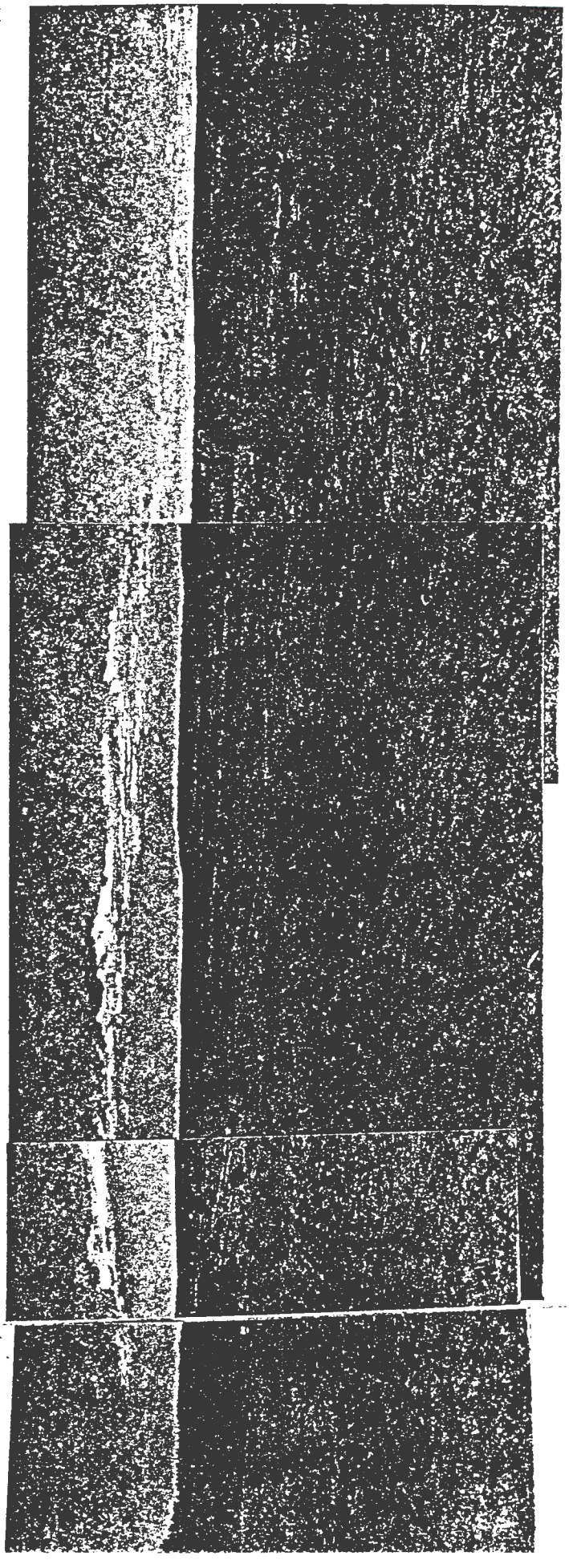
Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 1112 / South

Comments: The recontoured and revegetated waste pile is in the center of the photo. Nearest residences are to the right and the only building on-site is to the left of the photo.



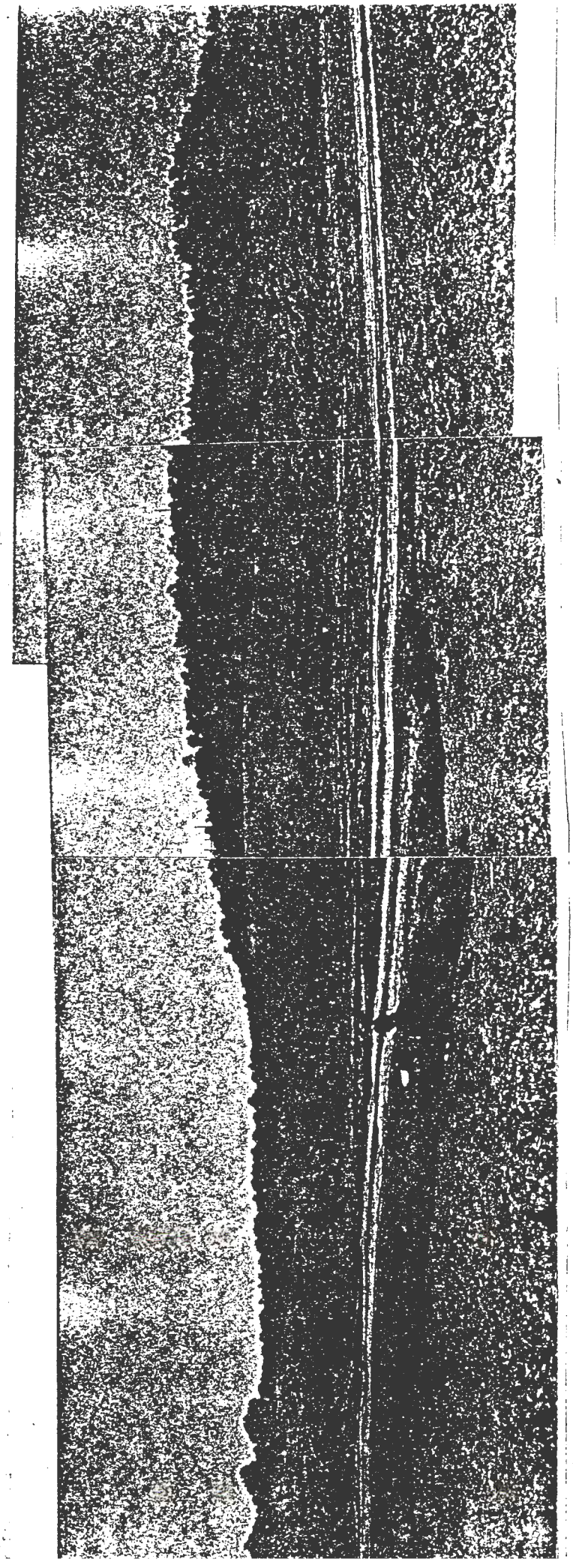
Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 1004 / West

Comments: From the middle of the pile facing west. Notice the development of the revegetation grasses in the foreground and the nearest residences in the background.



Photographer / Witness

R.Rawlings / S.Cary

Date / Time / Direction

07-10-86 / 1038 / East-Southeast

Comments: Several small erosion gullies can be seen on the west facing slope of the pile. Steve Cary is collecting a sediment sample in the drainage arroyo from the base of the waste pile.

WESTERN NUCLEAR

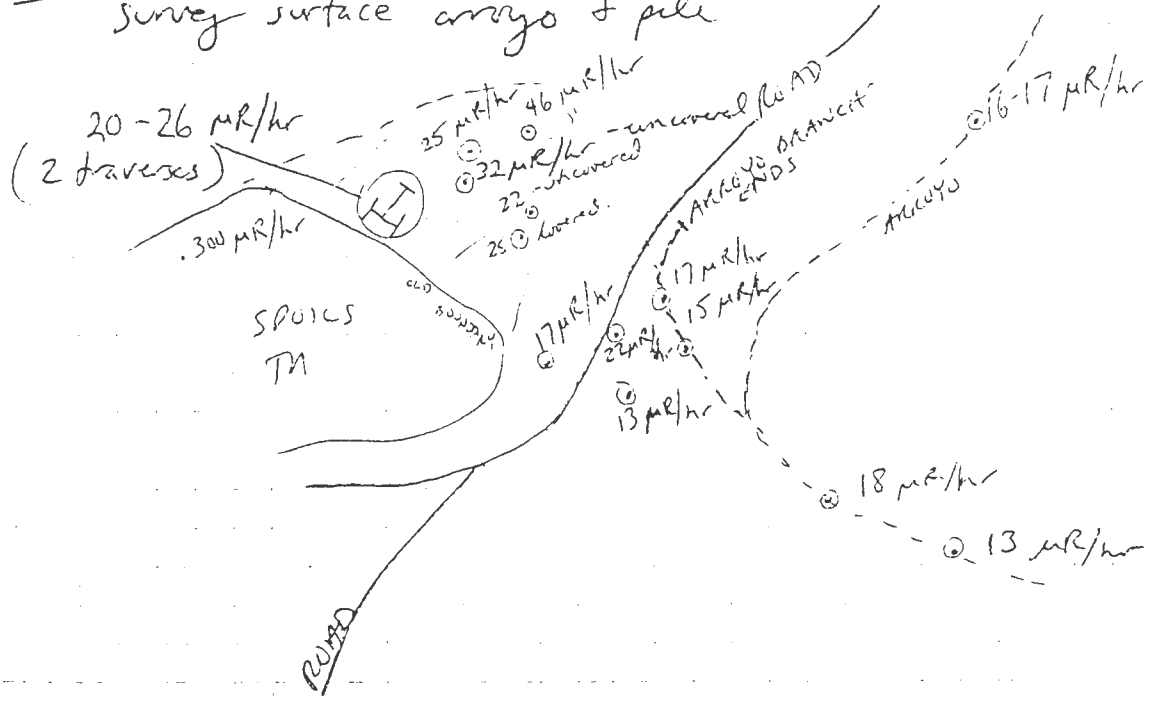
Site recon - May 16, 1985; Cloudy, mild Temp ~ 60°;
— heavy equipment at site covering tailings pile
survey at tailings w/ scintilometer:

120 μR/hr in general
300 μR/hr on contact

ON-SITE INSPECTIONS

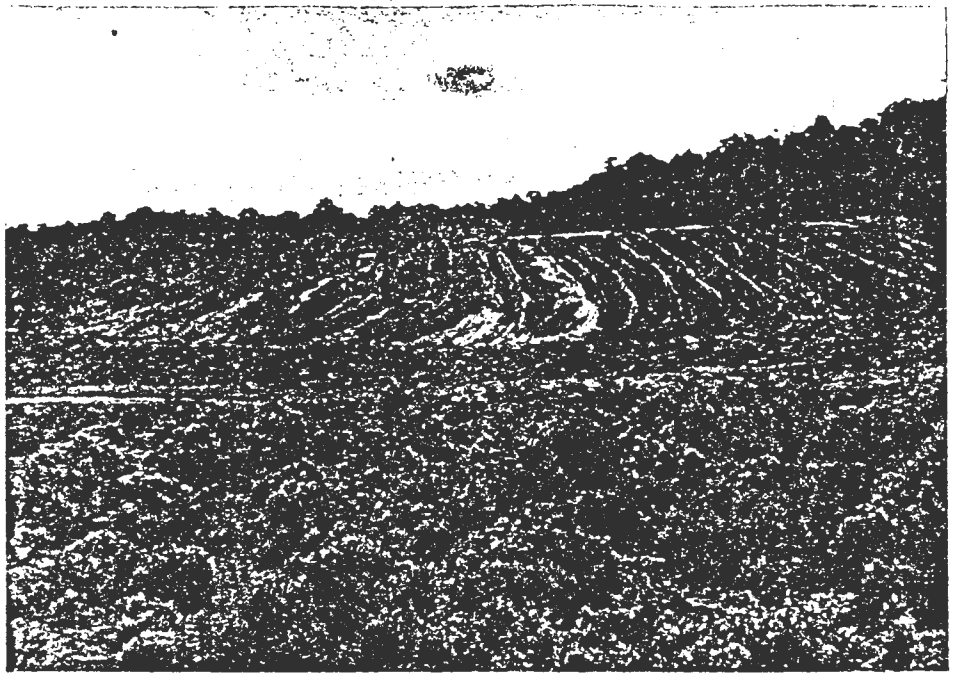
MICHAEL BROWN — EID; Radiation Bureau field measurements
RICHARD RAWLINGS — EID; GW/HW Surveillance
ROBERT LOWY — BTD — MSCA-PA/SI - P.M. MSCA-PA/SI Program

Survey surface arroyo + pile



Remedial cover-work began May 13, 1985 and equipment operators expect that work will cease sometime in mid-June, 1985

Fresh soil was brought in and used as cover
Toe of pile was flattened and covered
Pile is being graded to natural contours
Adit to mine is now covered (+ filled in).



Photographer / Witness

R.Rawlings / R.Lowy

Date / Time / Direction

05-16-85 / 1235 / East

Comments: Face of spoils pile. Reclamation work in progress. Pile of cover soil is visible at top of spoils pile.

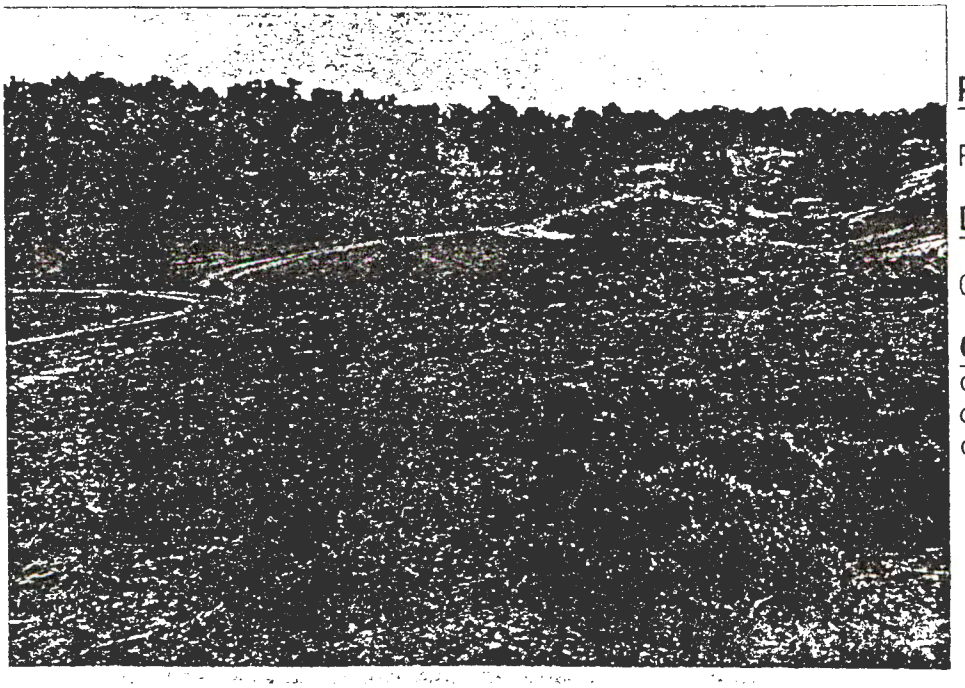
Photographer / Witness

R.Rawlings / R.Lowy

Date / Time / Direction

05-16-85 / 1230 / North-east

Comments: Mine spoils pile from the south-west corner. Reclamation work in progress.



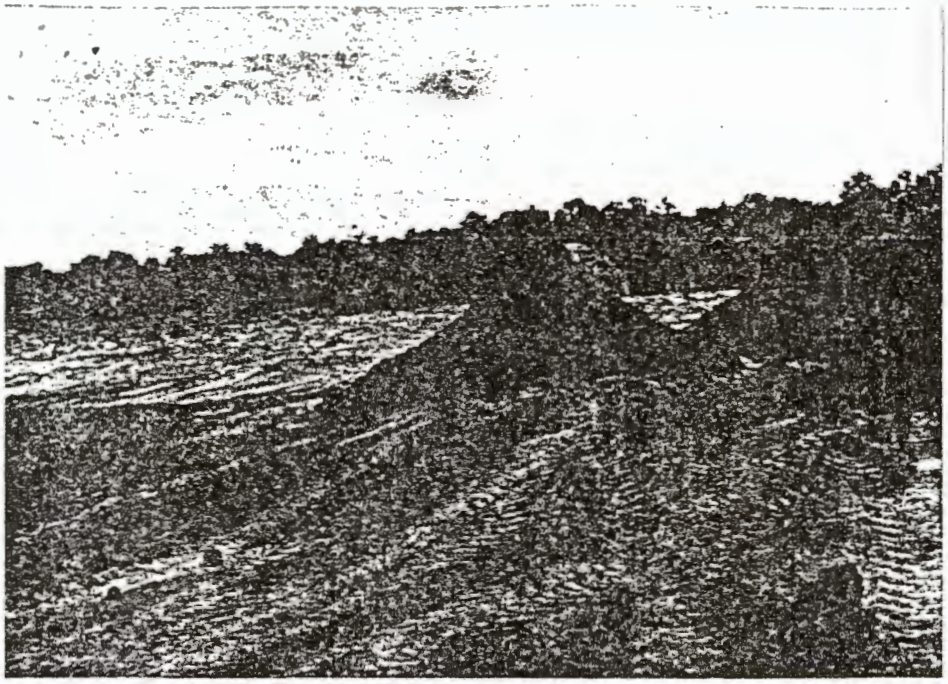
Photographer / Witness

R.Rawlings / R.Lowy

Date / Time / Direction

05-16-85 / 1236 / North

Comments: Road grader is at toe of spoils pile. Drainage arroyo down north-western side of pile is on the far side of the grader.



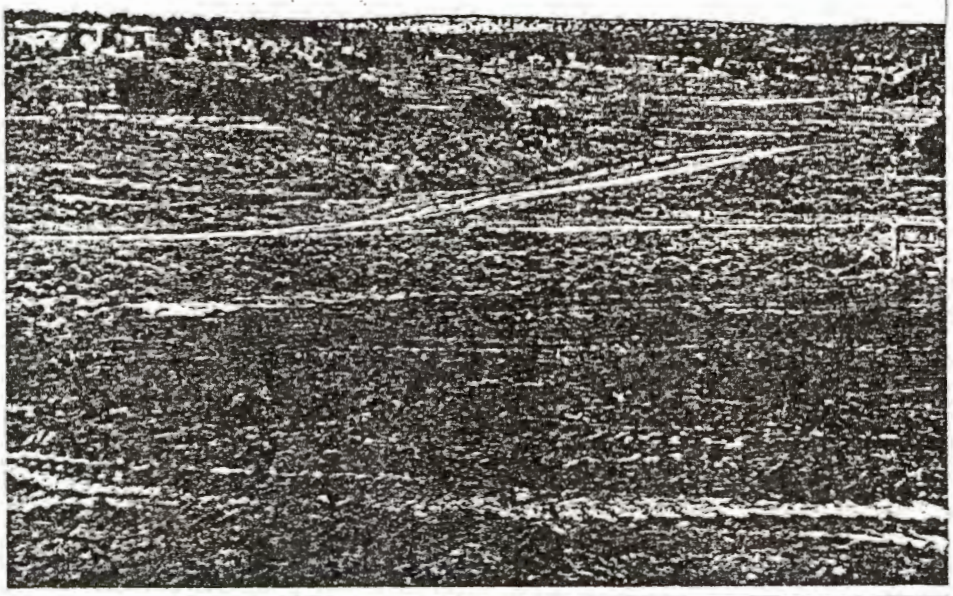
Photographer / Witness

R.Rawlings / R.Lowy

Date / Time / Direction

05-16-85 / 1242 / East

Comments: Stock pile of cover soil at the top of the spoils pile.



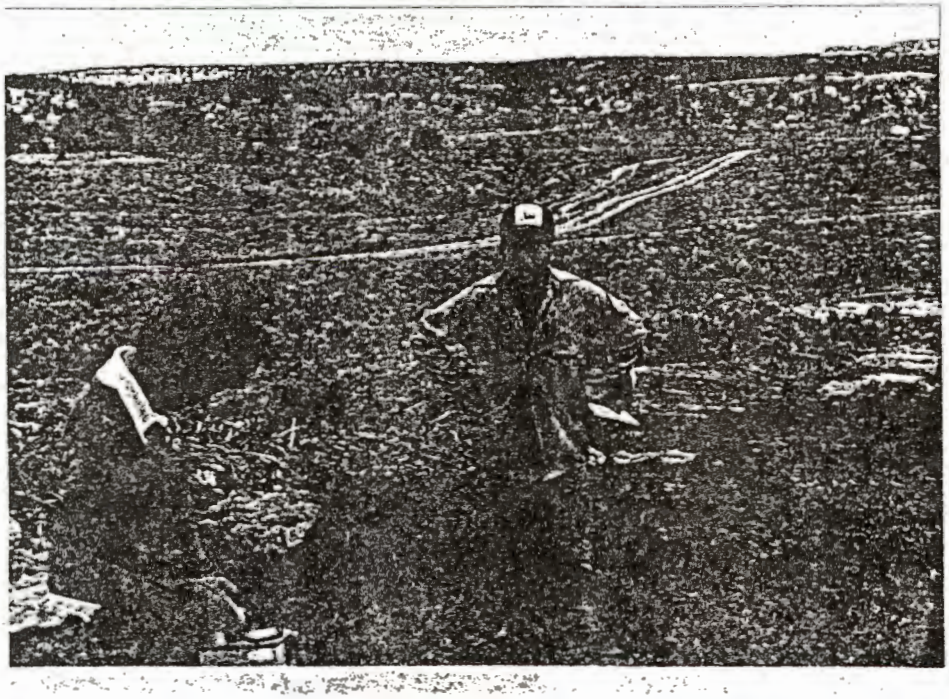
Photographer / Witness

R.Rawlings / R.Lowy

Date / Time / Direction

05-16-85 / 1244 / North-west

Comments: Applied cover soil in the foreground and the main drainage arroyo at the toe of the pile in the middle ground of the photo.



Photographer / Witness

R.Rawlings / R.Lowy

Date / Time / Direction

05-16-85 / 1247 / North-west

Comments: Mike Brown and Robert Lowy measuring radiation levels at the southern edge of the spoils pile.

THE NAVAJO NATION

WINDOW ROCK, NAVAJO NATION (ARIZONA) 86515

PETERSON ZAH
CHAIRMAN, NAVAJO TRIBAL COUNCIL

EDWARD T. BEGA
VICE CHAIRMAN, NAVAJO TRIBAL

September 21, 1984

re. a different mine in Sect. 21

M E M O R A N D U M

TO Louise A. Linkin, Director
Environmental Protection Administration

FROM _____
Tommy K. Begay, Jr., Environmental Specialist
Environmental Protection Administration

SUBJECT: Field Trip Report from an inspection conducted on September 11, 1984 on the Section 21 Mine, Western Nuclear Inc., located in the NW¼, NW¼ of Section 21, Range 13 West, Township 15 North.

The Section 21 Mine is located in the Smith Lake area of McKinley County, New Mexico. Information from our files indicate that the origin of this mine began on July 1, 1972, when Western Nuclear, Inc. leased the mineral rights from the New Mexico and Arizona Land Company. On September 26, 1974. Western Nuclear entered into a new joint operating agreement with the New Mexico and Arizona Land Company to develop and mine this property.

The maintenance and administration facilities required for the operation included a water well, a power system, an access road, a stock-pile area, Sanitary facilities and two buildings (See attached map).

FINDINGS: The buildings and structures mentioned above remain intact on the site with the addition of the remnants of two 10 ten underground haul trucks in the northeast corner of the site. The waste disposal and ore storage remain in excess of approximately 202,500 cubic yards.

Gamma readings taken with a Ludlum Model 19 Micro R Meter ranged from 35 uR to 405 uR/Hr. (See grid pattern). At the base of the pile, in the northwest corner, is a small pond. In front of this pond (NW corner of the site) is a sign that reads..."Soil Stockpile, DO NOT DISTURB, Western Nuclear, Inc., Land Reclamation Program".

The nearest resident to the site is approximately ½ mile away in a southwestern direction. Currently, we are still awaiting data on the number of residences and housing units in a 3 mile and 5 mile radius. Also, soil samples were gathered from the site and will be forwarded to the New Mexico Environmental Improvement Division (NMEID) Soil Analysis Laboratory. Photographs were taken and we are still awaiting the development of these. More information will be forwarded to you as it is made available.

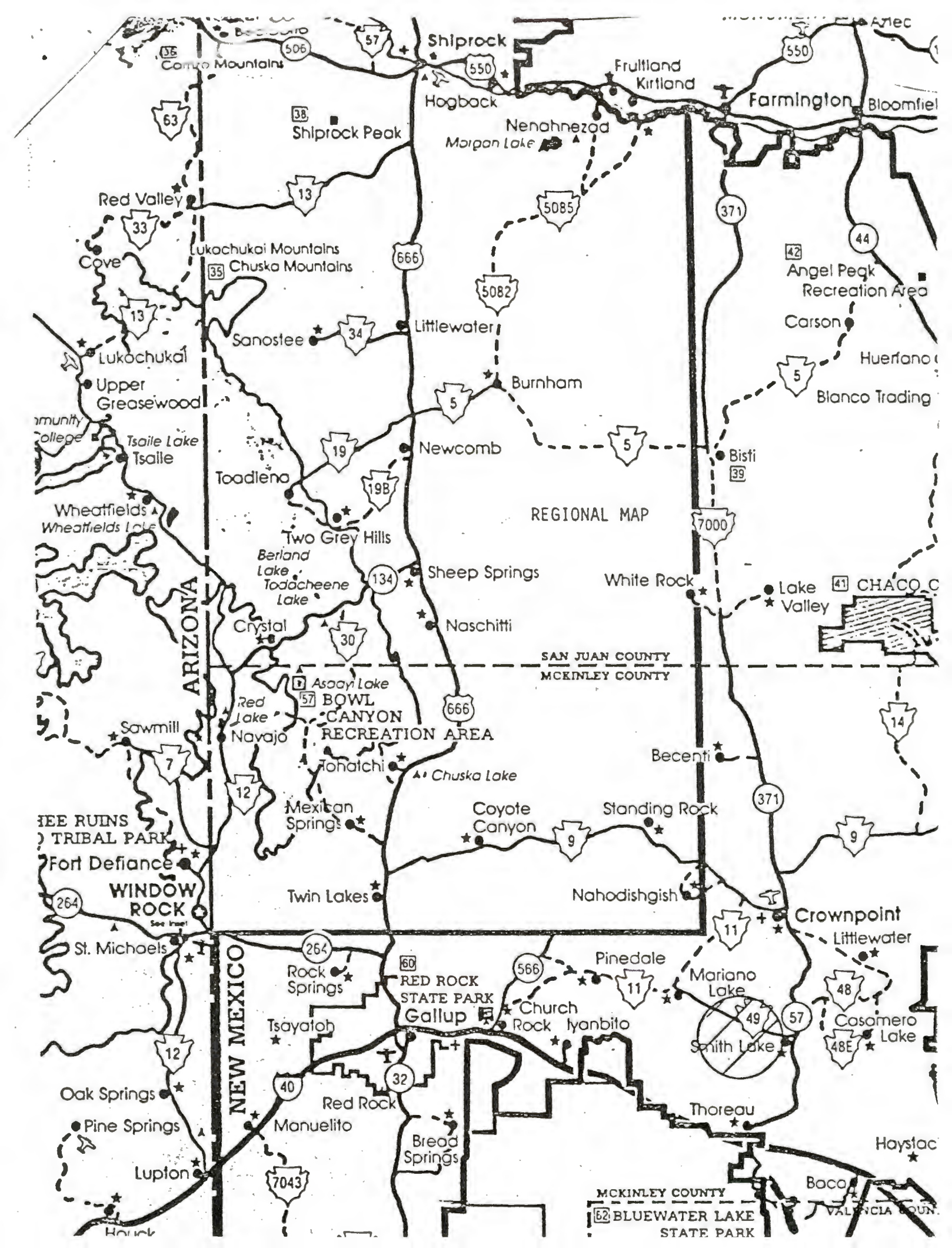
CONCLUSION

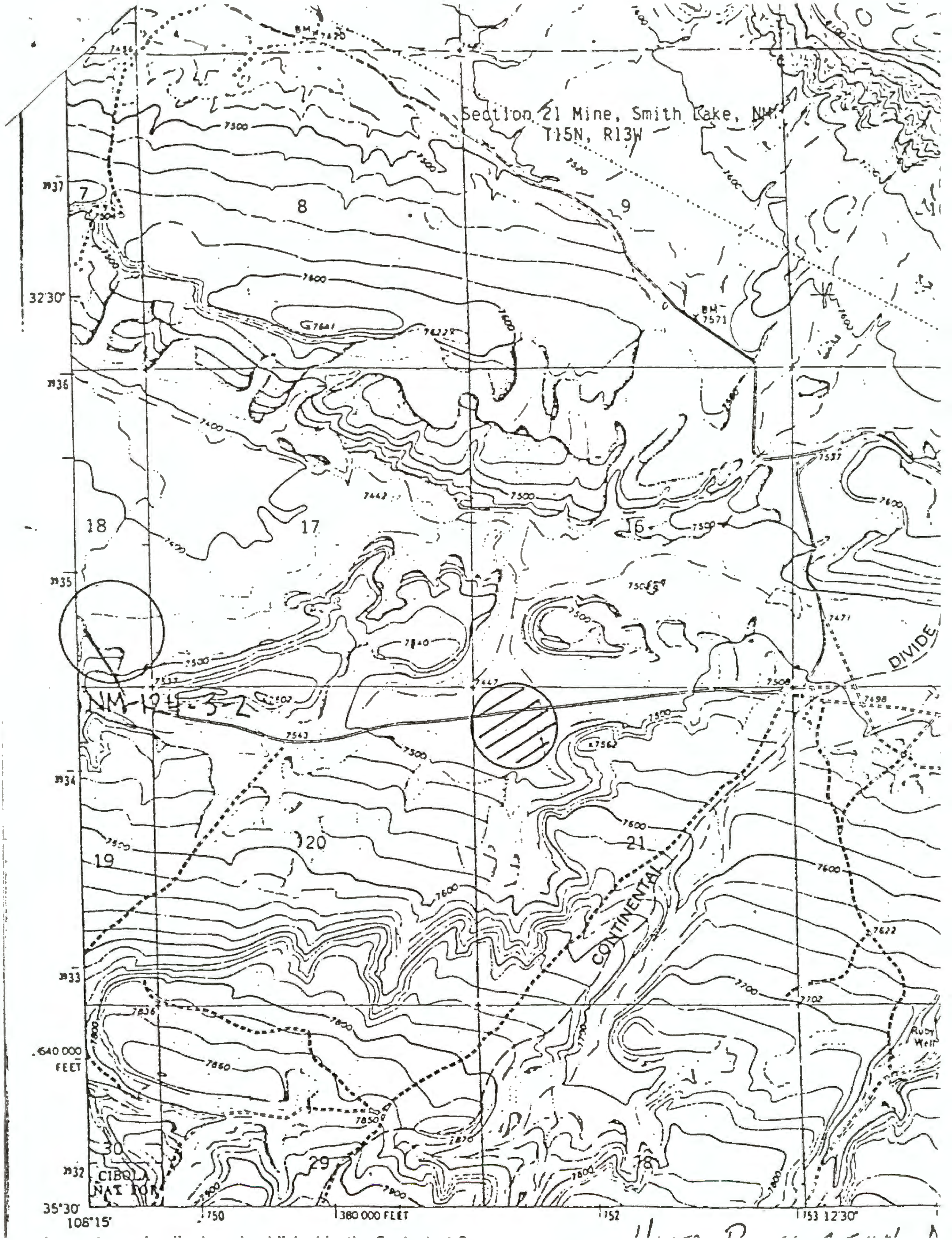
The waste disposal and ore storage pile present a major health hazard to people and livestock in the area. A plan of reclamation and restoration should be implemented as soon as possible. If this cannot be accomplished then a fence should be installed around this area.

RECOMMENDATION

This site will be recommended to the NMEID and the U.S. Environmental Protection Administration as a possible U.S. EPA Superfund Cleanup Project. All information pertinent to this site will be forwarded to both parties for analysis, and perhaps, a possible ranking. More information is still being gathered on this site.

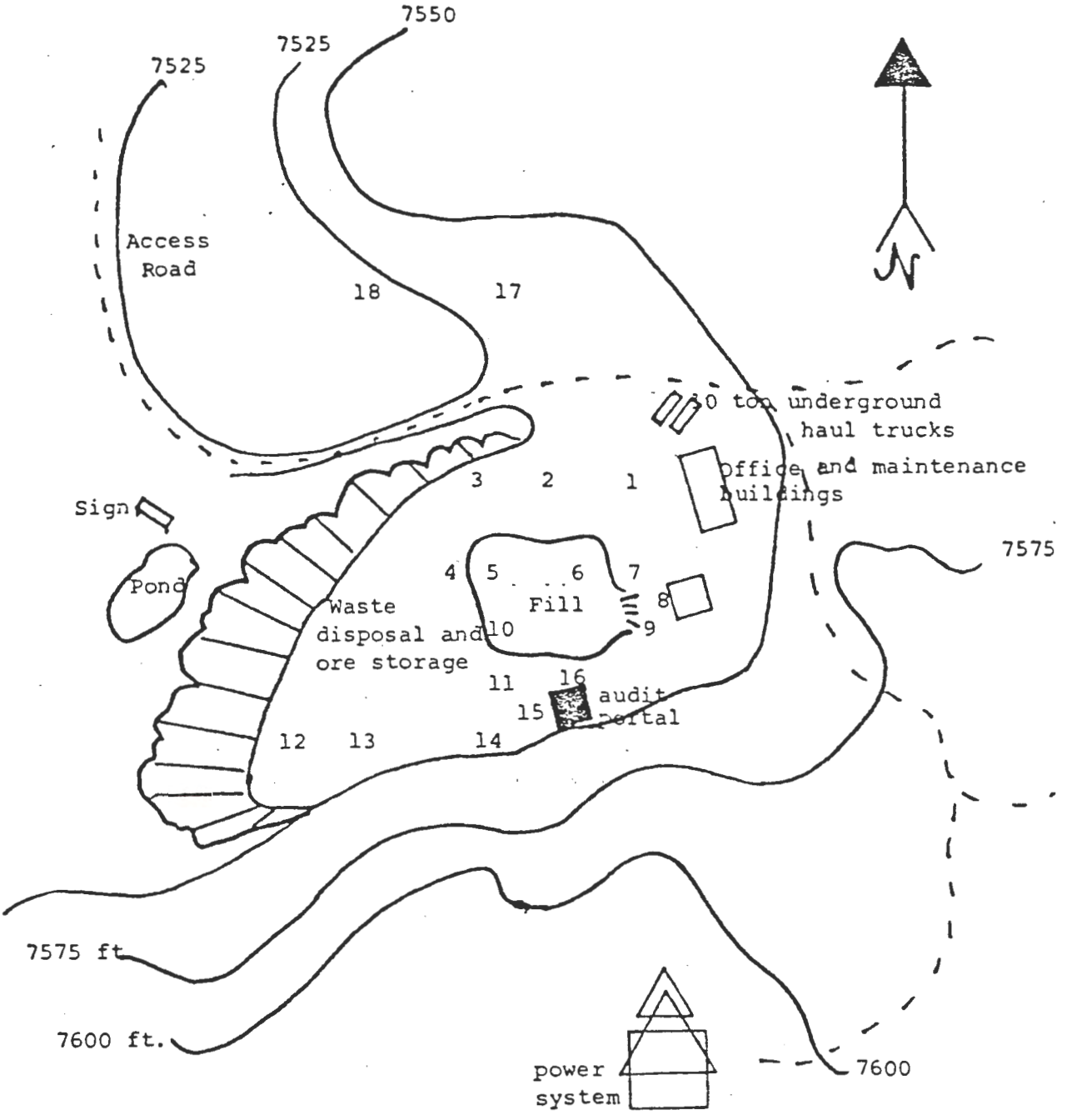
If you should require additional information, or have any questions, please contact me or Raymond Roessel, Environmental Technician, at Tribal Extensions 1534-1535 or 1536.


Shiprock
Hogbock
Fruitland
Kirtland
Farmington
Aztec
Bloomfield
Nenahnezad
Morgan Lake
Shiprock Peak
Red Valley
Cove
Lukachukai Mountains
Chuska Mountains
Lukachukai
Upper Greasewood
Tsaile Lake
Tsaile
Wheatfields
Wheatfields Lake
Toadlena
Two Grey Hills
Berland Lake
Todacheene Lake
Newcomb
Littlewater
Sanostee
Burnham
Angel Peak Recreation Area
Carson
Blanco Trading
Bisti
REGIONAL MAP
White Rock
Lake Valley
CHACO
Sheep Springs
Naschitti
Crystal
ARIZONA
NEW MEXICO
SAN JUAN COUNTY
MCKINLEY COUNTY
Asaayi Lake
BOWL CANYON RECREATION AREA
Red Lake
Navajo
Sawmill
Tohatchi
Chuska Lake
Becenti
Mexican Springs
Coyote Canyon
Standing Rock
Fort Defiance
WINDOW ROCK
Twin Lakes
Nahodishgish
Crownpoint
Littlewater
St. Michaels
Rock Springs
RED ROCK STATE PARK
Gallup
Church Rock
Iyanbito
Pinedale
Mariano Lake
Smith Lake
Cosamero Lake
Tsayatoh
Oak Springs
Pine Springs
Lupton
Manuelito
Red Rock
Bread Springs
Thoreau
Haystack
Baca
MCKINLEY COUNTY
BLUEWATER LAKE STATE PARK
VALENCIA COUNTY



Section 21 Mine, Smith Lake, NM
T15N, R13W
NM-121-3-2
7
8
9
16
17
18
19
20
21
29
30
CONTINENTAL
DIVIDE
CIBOLA
NAT FOR
Ruby Well
BM 7420
BM 7571
G7641
7500
7600
7400
7442
7537
7471
7498
7508
7543
7562
7622
7700
7702
7800
7836
7850
7860
7870
7900
3937
3936
3935
3934
3933
3932
32'30"
35°30'
108°15'
640 000 FEET
750
380 000 FEET
752
753 12'30"

GRID SURVEY


7550
7525
7525
Access
Road
18
17
10 ton underground
haul trucks
Office and maintenance
buildings
3
2
1
Sign
Pond
4
5
6
7
8
Waste
disposal and
ore storage
Fill
10
9
11
16
audit
portal
15
12
13
14
7575
7575 ft
7600 ft.
power
system
7600

GRID SURVEY
Ludlum Model No. 19 Micro R Meter

	uR/Hr.		uR/Hr.
1.	160	10.	75
2.	173	11.	405
3.	175	12.	325
4.	190	13.	350
5.	100	14.	200
6.	90	15.	150
7.	120	16.	155
8.	100	17.	175
9.	36	18.	35