RESOURCE CONSERVATION AND RECOVERY ACT PART B PERMIT APPLICATION FOR OPEN BURNING/OPEN DETONATION AREAS

U.S. Army Dugway Proving Ground
Dugway, Utah 84022-5000
EPA ID UT3750211259

Volume I
Sections I and II

Office of the Commander
U.S. Army Dugway Proving Ground

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(Contract No. DAAD09-93-C-0016)

September 30, 1993

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II. PART B GENERAL INFORMATION REQUIREMENTS

II.A. FACILITY DESCRIPTION

II.A1 GENERAL DESCRIPTION: 270.14(b)(1), 264.1; R315-2-1, R315-3-5(b)(1)

II.A1.1 Applicability of Part B to this Facility: 264.1; R315-2-1

Dugway Proving Ground (DPG) is a subordinate command of the U.S. Army Test and Evaluation Command (TECOM). DPG's primary mission is to perform testing on conventional munitions systems, chemical/biological warfare defense systems, and flame, incendiary, and smoke obscurant systems. DPG is the only testing facility in the U.S. equipped to perform these tasks on the scale necessary to ensure that items have been thoroughly developed and tested under realistic conditions. DPG began operation in 1942 when testing of military weapons commenced during World War II. DPG was activated in order to meet the need of the Chemical Warfare Service for expanded testing facilities. The site was selected because of its seclusion, low population density, and scarcity of wildlife. Exhibit II.A-1 shows the regional location of the DPG facility.

DPG can be divided into 3 major activity areas: (1) the housing, administrative, and National Guard Maneuver Areas (including English Village and Fries Park); (2) the Avery and Ditto Technical Centers and Carr Facility; and (3) Baker Laboratory, the test grids, and buffer areas south and west of Ditto Technical Center. The Post Headquarters are located at English Village, the Life Sciences Division is at Baker, the Weapons Branch of the Test Conduct Division is at Carr, and the Chemical Laboratory Division is at Ditto. Exhibit II.A-2 shows the location of these activity areas in relation to the OB/OD Area.

In the course of its research and testing operations, as well as routine functions, DPG generates various hazardous wastes which may be stored on-site or transported to an off-site treatment, storage, or disposal facility through the Defense Reutilization and Marketing Office (DRMO) or a private contractor. Hazardous wastes at DPG are managed in the following RCRA regulated units:

- Container Storage Building (Building 6672) at the Central Hazardous Waste Storage Facility (CHWSF);
- F999 Container Storage Building (Building 6673) at the CHWSF;
- Igloo G, which is used to store unexploded munitions containing chemical agent that are found on the test ranges; and
- The Open Burning/Open Detonation (OB/OD) Area.

A RCRA permit was issued to the facility in 1993 to cover operations at the CHWSF and the F999 Container Storage Building. DPG submitted a permit modification to the State of Utah in 1993 to cover operations at Igloo G. Pursuant to 40 CFR 264 Subpart X, a Part B permit application was submitted to the State of Utah and EPA Region VIII on November 8, 1988 and subsequently granted automatic interim status for its RCRA operations.

With this revised Subpart X permit application, DPG is seeking a RCRA operating permit to thermally treat reactive hazardous waste by OB/OD. Units used to treat reactive wastes in this manner are classified as miscellaneous (Subpart X) units and are now regulated by the State of Utah under R315-8-16. DPG is seeking to permit one Subpart X unit that will be used to demilitarize waste propellants, explosives, and pyrotechnics (PEP) by either OB within containment trays (burn pans) or OD on the ground surface.

II.A1.2 Manages Waste Generated On-Site and Off-Site: 270.14(b)(1); R315-3-5(b)(1), R315-8-2.4

Only on-site-generated hazardous waste propellants, explosives, and pyrotechnics (PEP) are treated in the OB/OD Area. Wastes that are designated

Exhibit II.A-1: Location of U.S. Army Dugway Proving Ground in Utah

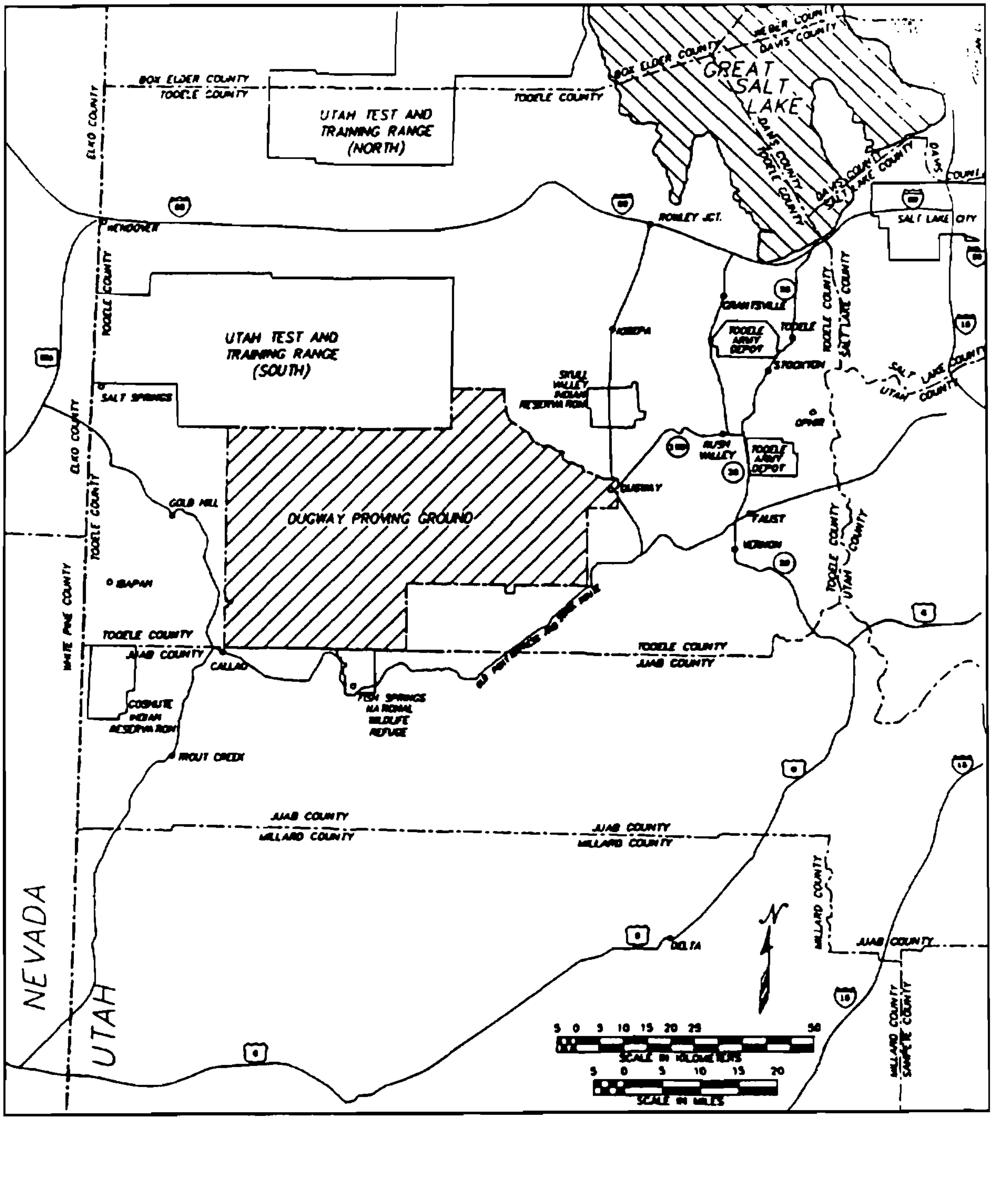
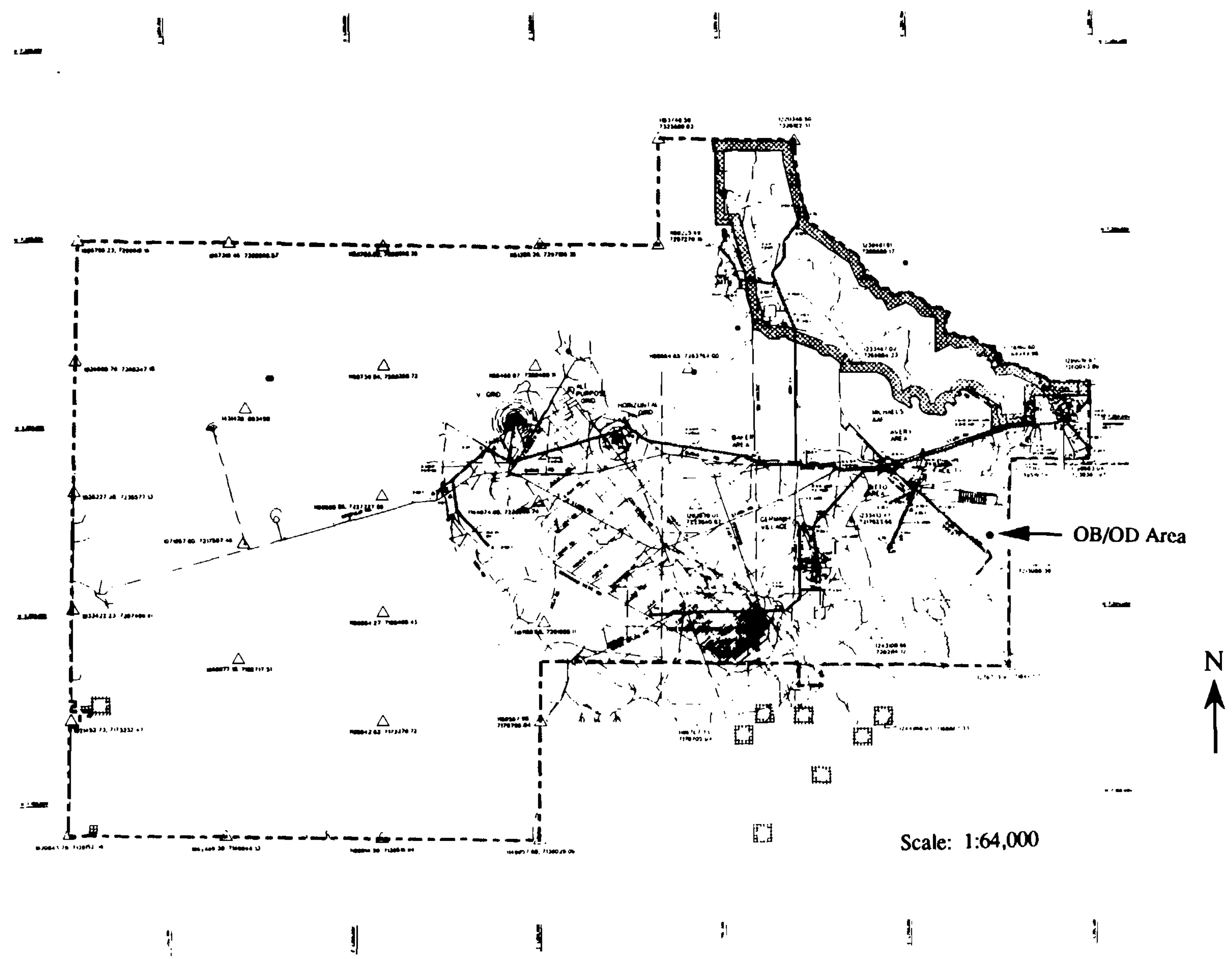


Exhibit II.A-2: Major Activity at Dugway Proving Ground



for disassembly and subsequent treatment at the OB/OD Area include rejected munitions and components that do not meet appropriate military standards or have been declared unsafe. This declaration may arise as a result of any of the following:

- The age of the item has exceeded its maximum intended "shelf life";
- The item appears to have been damaged, e.g., drop testing may dent the casing of a round;
- The item shows evidence of deterioration, such as rust;
- The item has been declared surplus; or
- The item is unexploded ordnance from training operations.

Section II.B of this application describes the specific types of wastes to be treated in the unit in greater detail.

The Open Burning/Open Detonation (OB/OD) Area covers approximately 40 acres and has three burn pans. A maximum of 5,000 pounds gross weight (2.5 tons/hour) of munitions housing and mechanisms, as well as PEP materials was set as the range limit for each detonation. A maximum of 1,000 pounds of PEP was set as the limit for open burning in each of the three burn pans. OB/OD treatment is typically performed once or twice per month.

II.A1.3 <u>Location</u>: 270.14(b)(1); R315-3-5(b)(1)

DPG is located in a remote area of central Utah approximately 67 miles southwest of Salt Lake City. DPG lies within Tooele County and occupies an area approximately 52 miles long and 35 miles wide. The tract is situated in the southwest corner of the Great Salt Lake Desert and extends into parts of Dugway and Skull Valleys.

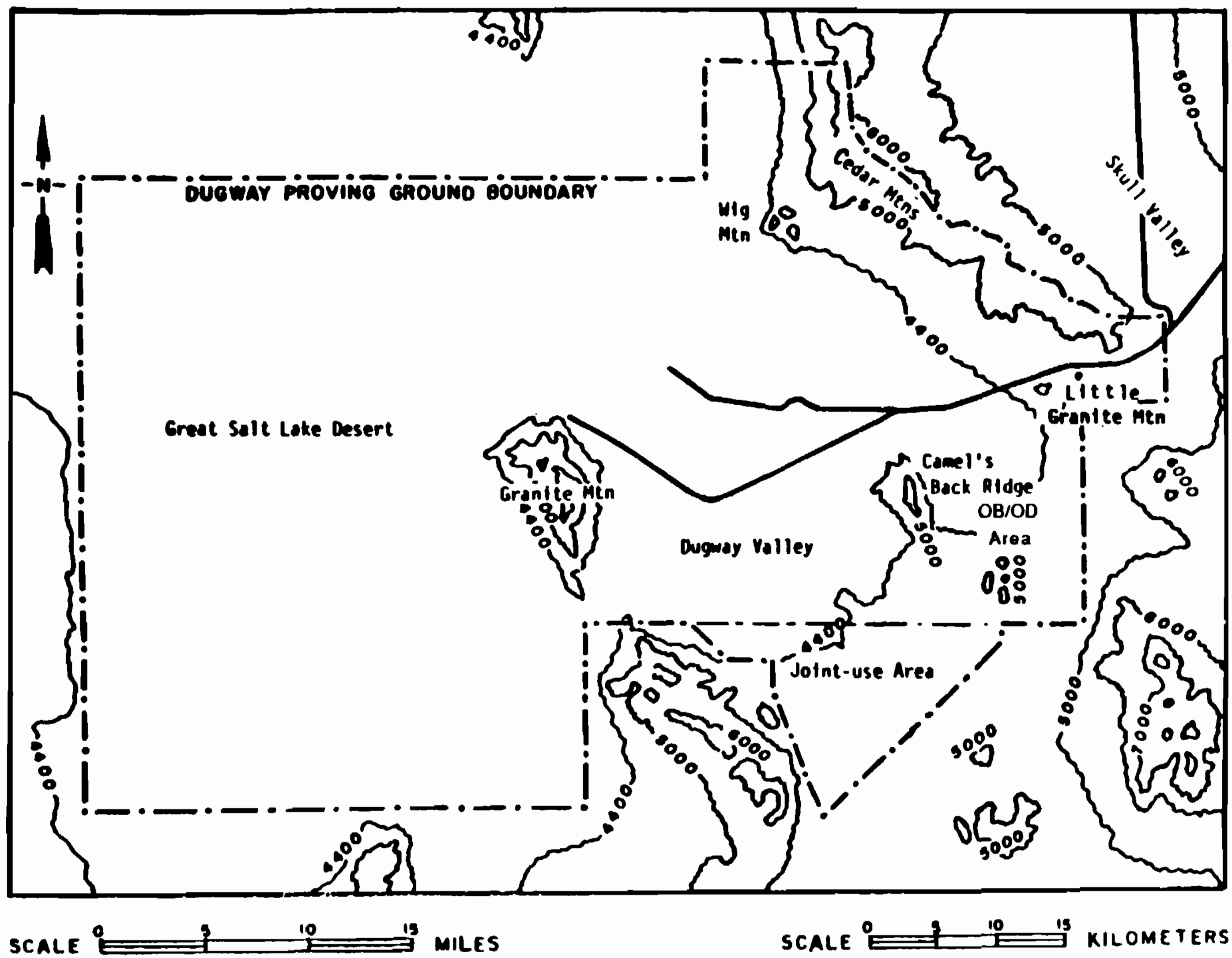
The installation covers approximately 840,911 acres and includes mountains, valleys, and a large flat sparsely vegetated area that extends westward into the southern reaches of the barren salt flats of the Great Salt Lake Desert. Most of this land is unimproved, with 300 acres of improved land and 536 acres of semi-improved land, mostly in English Village.

The terrain is mainly flat or gently sloping with intermittent sand dunes and small hills. The Cedar Mountain Range extends from English Village northwesterly forming the northeast boundary of the reservation. Little Granite Mountain, Camel Back Ridge, Wig Mountain, and Granite Mountain divide the installation into several minor areas. Exhibit II.A-3 shows the major topographical features of DPG.

The OB/OD Area is located in the southeast portion of DPG. The area where the OB/OD Area is located has been used for OB/OD and as a firing range for approximately the last 30 years. The OB/OD Area consists of an oval-shaped area approximately 1800 feet in length by 1300 feet in width, which has been cleared of vegetation. The area is located approximately three and a half miles southeast of the Carr Facility and 1400 feet northeast of Durand Road (also known as Simpson Springs Road). The OB/OD Area and the surrounding area are flat, with a gentle slope to the northwest.

DPG personnel do not regularly work in or traverse through the immediate vicinity of the OB/OD Area. The Carr Facility is the closest area where DPG personnel work on a regular basis. The closest residences are located in English Village approximately 7.5 miles northeast of the treatment unit. The closest DPG property boundary is located approximately two miles to the east. The land beyond the eastern boundary is administered by the Bureau of Land Management.

Exhibit II.A-3: Major Features of Dugway Proving Ground



(Source: Dugway Proving Ground, 1982)

II.A1.4 **Owner or Operator's Name**: 270.14(b)(1); R315-3-5(b)(1)

The address of DPG is as follows:

U.S. Army Dugway Proving Ground
Dugway Proving Ground
Dugway, UT 84022

Operator:	Col. James King, Commander
Facility Contact:	Ed Duplak, Chief Environmental Program Office (801) 831-3417

II.A1.5 **Types of Waste Management Activities Conducted**: 270.14(b)(1); R315-3-5(b)(1)

The Office of the Commander is responsible for and oversees the demilitarization of waste munitions and ordnance classified as hazardous because of reactivity. Demilitarization of reactive wastes is accomplished by thermal treatment. The two processes used are open burning and open detonation. Open burning of waste military energetic materials is conducted in specially constructed containment devices (i.e., burn pans) to prevent hazardous constituents and burning residuals from coming in contact with the ground. Bulk propellants or other energetic materials are placed in a burn pan and ignited. Open detonation of ammunition or explosives is conducted on the ground surface. Initiating charges are placed in intimate contact with the items to be detonated and are remotely initiated. Following OB/OD treatment, all residuals including ash and scrap metal are containerized and later characterized for proper disposal. A detailed discussion of OB/OD operations is provided in Section III of this application.

DPG offices that have specific roles in the performance and oversight of OB/OD activities are described below.

- The Environmental Protection Office (EPO) is responsible for assuring that all State and Federal environmental laws and regulations are met with respect to OB/OD activities. The EPO advises other DPG groups of regulatory compliance requirements and interacts with the regulating agencies.

- The Weapons Branch of the Material Test Directorate is one of two offices that conducts OB/OD for the demilitarization of test items. The Weapons Branch maintains logs of the destructed materials and has primary responsibility for the operation, inspection, and maintenance of the OB/OD Area.

- The Escort and Disposal Detachment is part of the Technical Escort Unit stationed at DPG. The Escort and Disposal Detachment is responsible for conducting OB/OD of waste munitions from training exercises not managed by the Weapons Branch. This group provides DPG with a rapid-response chemical accident/incident control force, provides technical escort services for agent munitions as requested, and provides explosive ordnance disposal support.

- Quality Assurance Specialists Ammunition Surveillance (QASAS) is involved in investigating the contributing causes of and preventative measures for all accidents at the OB/OD Area that result in personnel injury and/or property damage.

- The Fire Prevention and Protection Division within the Directorate of Engineering, Housing and Logistics provides fire-fighting support on an on-call basis. This group is notified in advance of all OB/OD treatment events.

- The Installation Safety Office is responsible for overseeing the safe conduct of OB/OD activities. The Installation Safety Office ensures that Standard Operating Procedures (SOPs) for OB/OD are adhered to and updated annually as necessary. The Safety Director is also involved in investigating the contributing cause of and preventative measures for all accidents at the OB/OD Area that result in personnel injury and/or property damage.

- The Security Division of the Directorate of Law Enforcement and Security assures that unauthorized personnel do not enter the OB/OD Area at any time.

II.A1.6 <u>Type of Treatment Unit</u>: 270.14(b)(1); R315-3-5(b)(1)

DPG is seeking to permit one Subpart X unit that will be used to demilitarize waste PEP by either OB within burn pans or OD on the ground surface. The three burn pans are located in three different locations in the northern section of the area. One pan was placed into service in 1987, and the remaining two pans began operations in 1992. OD may be performed anywhere in the vegetation-cleared area, but is generally performed near the center. The topographic map presented as Exhibit II.A-4 shows the layout of the OB/OD Area.

In the event that munitions are brought to the OB/OD Area and the burn or detonation operation must be terminated prior to completion (e.g., due to changes in weather, etc.), the waste munitions will be placed in one of two temporary 90-day storage areas. These areas are portable, enclosed steel ammo magazines located near the OB/OD Area (see Exhibit II.A-4). **(Note: The topographic map is currently under revision to accurately reflect the present boundaries of the OB/OD Area, as well as the location of waste storage facilities at the unit. The revised topographic map will be submitted to the State upon its completion.)** The munitions will only be held in temporary storage for the absolute minimum time necessary to safely complete the operation. It is expected that this time would be 24 hours or less.

A third ammo magazine will be used as a satellite accumulation area to store range-recovered scrap metal and residual ash collected during routine inspections of the OB/OD Area and cleanup following treatment. The scrap metal and ash will be field-tested to ensure that no reactive constituents remain on the scrap and the materials will be containerized and held in the OB/OD portable magazine storage units as satellite accumulation. If reactive residues are found on the scrap metal, it will be detonated again to treat the residues. If the ash in the burn pans is determined to be reactive, the ash will be burned again. When 55 gallons of ash or scrap metal have accumulated, the waste will be transferred to a 90-day storage area at the Carr Facility. Here the waste will be characterized and, if hazardous, will be sent to DPG's RCRA permitted Central Hazardous Waste Storage Facility (CHWSF) for proper subsequent management.

II.A1.7 <u>Engineering Drawings</u>: 270.14(b)(1); R315-3-5(b)(1)

A discussion of the engineering design of the OB/OD Area treatment units is provided in Section III.A of this application. Engineering drawings are provided in Section III of this application.

II.A1.8 <u>Specification of All Wastes that have been Managed at the Treatment Unit</u>: 270.14(b)(1); R315-3-5(b)(1)

The majority of the PEP wastes to be treated at the OB/OD Area are explosive wastes. Explosive waste is a sub-category of reactive waste in which the material has a potential to detonate. These wastes include bulk propellants, bulk high explosives, and munitions containing these items.

B	6-09-93	DRILL HOLES AND SAMPLE LOCATIONS ADDED	R
A	3-18-90	1000' CIRCLE ADDED	R
Rev.	Date		Appr.

AAA ENGINEERING & DRAFTING, INC.
1865 SOUTH MAIN, SUITE 12
SALT LAKE CITY, UTAH 84115

Project Engineer

License No.

Project Location

LOCATED IN SECTIONS 10, 11, 14, & 15
T. 8 S., R. 9 W., S.L.B.& M.
DUGWAY PROVING GROUND, UTAH

MAP OF O.B./O.D. ...

II.A2. **TOPOGRAPHIC MAP:** 270.14(b)(19), 270.14(c)(3), 270.14(c)(4)(i), 264.95; R315-3-5(b)(19)

Exhibit II.A-4 provides an aerial photograph of the OB/OD Area upon which topographic contours have been superimposed. The photograph has a scale of 1 inch equal to 200 feet and shows topographic contour intervals of 2 feet. As can be seen from the map, the topography of the land surrounding the OB/OD Area is quite flat. Due to the extremely low topographic gradient of the area and the small amount of precipitation (5 to 7 inches annually), the potential for surface run-on/run-off is very minimal.

Required topographic map information is discussed below:

- Due to the large size of DPG, it is not possible to show the location of the facility property boundaries on the topographic map. Exhibit II.A-2 shows the property boundaries in relation to the OB/OD Area.

- There are no permanent streams between the Stansbury Range east of DPG and the Deep Creek Mountains more than 60 miles to the west. Surface water from precipitation flows through established drainage channels onto the flat plain and evaporates. The nearest major drainage channel is Government Creek, which is an intermittent stream. Government Creek, at its nearest point, is located approximately 1 mile from the OB/OD Area to the southwest.

- As shown in Exhibit II.A-4, several small drainage channels approach the OB/OD Area from the southeast and, prior to its construction, flowed through the unit and exited the unit to the northwest. All traces of the drainage channels, however, have been eliminated within the OB/OD Area by regular grading of the site. Outside the boundaries of the unit, the ephemeral drainage channels are very difficult to located on the ground surface. According to facility personnel, the OB/OD Area has never been inundated with run-on or run-off. These drainage channels were sampled and analyzed for RCRA metals and explosive residues, which are potential contaminants from the OB/OD Area. The results of these analyses are discussed in greater detail in Section III.B4 of this permit application.

- The nearest inhabited buildings are located approximately three miles to the northwest at the Carr Facility. DPG personnel do not work in or traverse through the immediate vicinity of the OB/OD Area on a regular basis. The closest residences are located in English Village approximately 7.5 miles to the northeast.

- The only structures associated with the OB/OD Area are the three burn pans. The nearest structures to the OB/OD Area are the three portable ammo magazines. These are located near the intersection of Durand Road, approximately 1200 feet from the OB/OD treatment area. As shown by the aerial photo Exhibit II.A-4, there are no structures within a 1000 foot radius of the OB/OD Area. Exhibit II.A-4 shows the location of the burn pans and ammo magazines at the unit.

- Exhibit II.A-4 shows the four groundwater monitoring well locations at the OB/OD Area. These wells are discussed in greater detail in Section II.G of this permit application.

- As discussed in Section II.A4b of this application, no floodplain maps have been prepared that cover the DPG facility. However, based on an analysis of historical flooding records and flood patterns at DPG, the OB/OD Area lies approximately one mile from the nearest potential floodplain.

- Fire fighting equipment and emergency vehicles are based in English Village and Ditto. These two areas and their relation to the OB/OD Area are shown on Exhibit II.A-2.

- Exhibit II.A-6 identifies ownership of the major tracts of land in the vicinity of DPG. This figure does not identify the small tracts of state and privately-owned land scattered throughout that area which are under the jurisdiction of the Bureau of Land Management (BLM). Land use surrounding DPG is predominantly farming/grazing. All land within a radius of approximately 2 miles of the OB/OD Area is located within DPG boundaries.

- There are no flood control or drainage barriers, sewer system, or utilities at the OB/OD Area. The nearest public roadways are located more than 3 miles to the east. There are no passenger railroads in the vicinity of the OB/OD Area.

II.A3. DESCRIPTION OF THE TREATMENT UNIT(S): 270.23(a)(2); R315-3-6(a)(8)

II.A3.1 Location: 270.23(a)(2); R315-3-6(a)(8)

The OB/OD Area is located in the southeast portion of DPG. The OB/OD Area consists of an oval-shaped area, which has been cleared of vegetation, approximately 1300 feet in width by 1800 feet in length. The OB/OD Area is located approximately 3.5 miles southeast of the Carr Facility and 1400 feet northeast of Durand Road (also known as Simpson Springs Road). The Carr Facility is the closest area where DPG personnel work on a regular basis. The closest residences are located in English Village approximately 7.5 miles northeast of the treatment unit. The closest DPG property boundary is located approximately two miles to the east.

II.A3.2 Design: 270.23(a)(2); R315-3-6(a)(8)

Design of the OB/OD Area is described in detail in Section III.A of this application. This section describes the design of the three burn pans and the area where open detonation is performed.

II.A3.3 Operation: 270.23(a)(2); R315-3-6(a)(8)

OB/OD treatment of wastes is not performed on any regularly scheduled basis, but only when the need arises. OB/OD operations are typically performed once or twice per month. There is no distinction between the three burn pans, and any pan may be used to treat any waste by open burning. Only one burn per pan per day may be conducted. Several open detonation events may be conducted in a single day, depending on need, and in strict accordance with standard operating procedures.

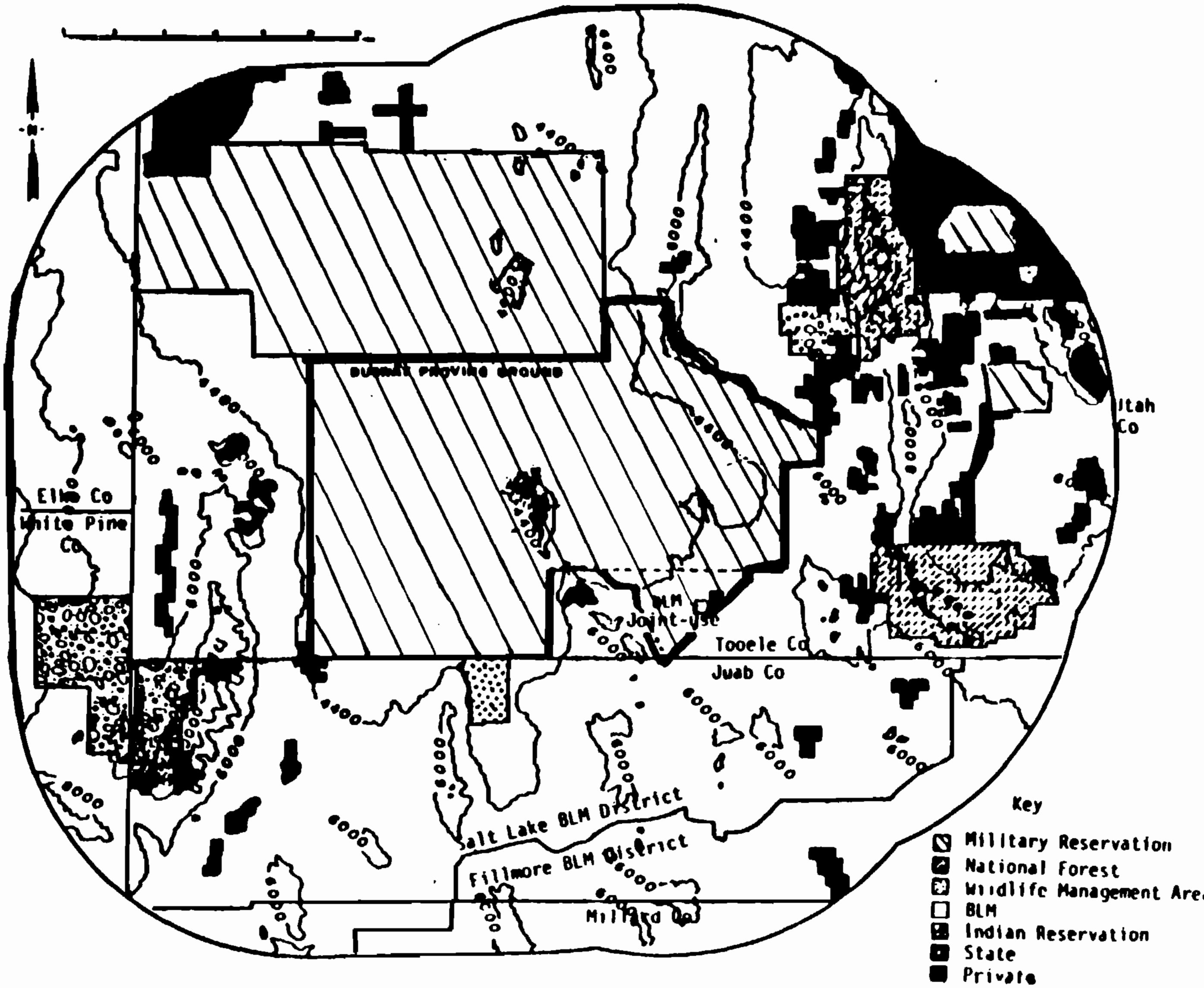
Section III.A of this application describes in detail the operation of the OB/OD Area including: unloading of waste from transport vehicles, procedures for placing and initiating treatment, procedures for determining that treatment is complete, and procedures for handling and disposing of residues following treatment.

Section III.C of this application discusses the meteorological conditions under which the unit may be operated.

II.A3.4 Maintenance: 270.23(a)(2); R315-3-6(a)(8)

The OB/OD Area is graded with a road grader several times per year to remove vegetation and to fill in craters caused by detonations. It is necessary to remove vegetative growth on a regular basis as a precaution against fire hazards from OB/OD operations. Other maintenance of the OB/OD Area and any equipment used to operate the unit is performed as part of inspection

Exhibit II.A-6: Ownership of Major Tracts of Land in the Vicinity



(Source: Dugway Proving Ground, 1982)

procedures. Section II.C2 of this application describes in detail the inspection plan for the OB/OD Area.

II.A3.5 **Monitoring**: 270.23(a)(2); R315-3-6(a)(8)

Sampling of groundwater in the vicinity of the OB/OD Area was conducted to evaluate the impact of OB/OD treatment on the hydrogeological environment. Section II.G of this application discusses in detail the groundwater sampling activities performed at the unit.

Prior to initiating each treatment event, it is necessary to evaluate local meteorological conditions. Section III.C of this application discusses the meteorological conditions under which the unit may be operated and identifies procedures for collecting meteorological information.

II.A3.6 **Inspection**: 270.23(a)(2); R315-3-6(a)(8)

Regular inspections of the OB/OD Area are performed to prevent, detect, and respond to environmental or human health hazards that may occur in connection with OB/OD treatment. Section II.C2 of this application describes in detail the inspection plan for the OB/OD Area.

II.A3.7 **Closure**: 270.23(a)(2); R315-3-6(a)(8)

At closure all hazardous constituents will be removed from the unit to levels protective of human health and the environment. Section II.F of this application describes in detail procedures to close the OB/OD Area.

II.A4. **FACILITY LOCATION INFORMATION**: 270.14(b)(11), 264.18; R315-3-5(b)(11), R315-8-2.9

II.A4a. **Seismic Requirements**: 270.14(b)(11)(i) and (ii), 264.18(a), Part 264 Appendix VI; R315-3-5(b)(11), R315-8-2.9

Although Utah is tectonically active, most of the earthquake activity occurs about 55 miles to the east along the Wasatch Range foothills. The U.S. Geological Survey has conducted a study to determine the distribution, relative age, and amount and extent of surface rupture on Quaternary fault scarps in the Tooele 1° by 2° Quadrangle in northwestern Utah (USGS, 1982). The conclusions of the study state that morphologic and geologic data collected along the fault scarps in the area indicate that all were formed during the late Pleistocene era with no clear evidence of Holocene surface faulting. Several faults inferred based on geophysical evidence are located on DPG; however, there is no evidence of displacement during Holocene time. The OB/OD Area is more than 200 feet from these inferred faults.

II.A4b. **Flood Plain Requirements**: 270.14(b)(11)(iii), 264.18(b); R315-3-5(b)(11), R315-8-2.9

A National Flood Insurance Rate Map, identifying the boundary of the 100-year flood, has not been prepared for DPG. There are no permanent streams or other surface water bodies on Dugway Proving Ground. Surface water from precipitation flows through well-established drainage channels onto the flat plain and evaporates. Like other arid regions, DPG is subject to flash flooding following high-precipitation events. Flash floods have occurred only four times in the history of the installation, in 1944, 1952, 1973, and 1983. The major area affected during flash floods has been the Government Creek drainage channel, which has overflowed and caused minor inundation of roads at Ditto Technical Center. The flow in the Government Creek channel is restricted by the culvert at Stark Road during periods of high flow, thus causing the area south of the road to flood. The flooding is not near any hazardous waste management unit, 90-day storage area, or accumulation area.

In order to evaluate the potential for flooding at DPG's hazardous waste management units, all available Flood Insurance Rate Maps for areas within Tooele County as well as location factors (e.g., topographic and geographic distances from known flood areas discussed in the preceding paragraph and the nearest large drainage way, Government Creek) were analyzed. The Flood Insurance Rate Maps of the five communities in Tooele County for which there are such maps show that the maximum width of the 100-year floodplain for any drainage way, perennial or ephemeral, is less than 1,000 feet. The Flood Insurance Rate Maps evaluated were for the towns of Stockton, Tooele, Vernon, Rush Valley, and Wendover.

Government Creek is expected to behave similarly to other drainage ways in the area. The OB/OD Area is located approximately 1 mile northeast of Government Creek. Therefore, it is not likely that a 100-year flood of Government Creek would affect the unit.

The OB/OD Area is in the path of several small drainage channels. However, due to the relatively small drainage area of these channels, inundation of the OB/OD Area is not likely. According to facility personnel, the OB/OD Area has never been inundated with run-on or run-off, even during the storm events that caused the flooding of Government Creek.

II.A5. TRAFFIC INFORMATION: 270.14(b)(10); R315-3-5(b)(10)

DPG is serviced by two hard-surfaced roads and one improved gravel road; none enters the installation. Utah State Route 199 connects DPG (via Johnson Pass) with Utah State Route 36 east of Rush Valley. County Road B-15 connects DPG (via Skull Valley) with U.S. Interstate 80 at Timpie Junction. An improved gravel road connects DPG (via Lookout Pass) with Utah State Route 36 near Vernon. Only the road over Johnson Pass goes through towns and villages. The remaining major hard-surfaced roads in the vicinity are Utah State Route 73 in Rush Valley and Alternate U.S. Route 50 in Nevada.

Within DPG there are approximately 693 miles of road; about 371 miles of which are regularly maintained. By type, the maintained roadways are classified as follows:

High grade bituminous pavement	74 miles
Low grade bituminous pavement	138 miles
Gravel	145 miles
Natural soil	14 miles
Total	371 miles

Roads within the grids and operation areas are, for the most part, single or double bituminous surface treatments. All roads leading to and within the built-up areas are bituminous surfaced. The flat or gently sloping terrain of DPG does not offer any major difficulties with respect to grades, vertical or horizontal curvature, and sight distance in the construction of roads. The natural soil will not support travel without turning to dust or rutting badly. Gravel is available from on-post borrow pits, and when crushed and compacted, makes an excellent base course. Roadways within specific areas of DPG are discussed below.

- English Village: Access to and through English Village is provided by Stark Road which runs through the southern part of the area. Stark Road, to this point, is a primary road, 24 feet wide with 3 foot shoulders, was recently resurfaced, and is in good condition. All primary streets in English Village are 24 feet wide, were recently resurfaced, and are in good condition.

- Ditto Technical Center: Access is provided by Stark Road which, to this point is a 24 foot wide road with 3 foot shoulders and is in good condition. Primary roads within this area are asphaltic concrete 30 feet wide, in good condition. Secondary roads are gravel and are 18 feet, 15 feet, and 30 feet wide respectively and are in good condition. Stark Road, servicing the western portions of the installation, is asphaltic concrete, 20 feet wide with 2 foot shoulders. The road to Michael Army Airfield is asphaltic concrete, 18 feet wide, in fair condition. Parking lots and the motor pool area are asphaltic concrete, in good condition. One parking lot and the area south of the motor pool are gravel, in good condition.

- Avery Technical Center: The access road to Avery Technical Center is a primary road, 20 feet wide with two foot shoulders, in good condition. Secondary roads within this area are 24 feet wide low bituminous type, in good condition. Parking areas are low bituminous type and are in good condition.

- R.W. Grid: The access road to R.W. Grid from Ditto Area is 16 feet wide, gravel, and in good condition.

- Fries Park: Access to Fries Park is provided by Stark Road. The 2 main roads in the now abandoned trailer court are asphaltic concrete; the west road being 16 feet and 14 feet and the east road 20 feet wide. None of the roads in the trailer area are maintained. The roads in the supply complex are gravel (12 feet to 20 feet wide), with the main road through the warehouse area 60 feet wide. All of the gravel roads are in good condition. All open storage areas are gravel and in good condition.

- Baker Area: Access is provided by Burns Road which is 18 feet wide with 2 foot shoulders. It is in good condition. Roads and parking within the area are low-type bituminous and are in fair to poor condition. Roads average 20 feet in width.

- Carr Facility: Access is provided by Durand Road (Simpson Springs Road) which is 18 feet wide with no shoulders. This road is in good condition. Primary roads within this area are medium bituminous type, 24 feet wide, in fair condition. Secondary roads are 10-foot-wide gravel-surfaced roads. Durand Road to the south of the Carr Facility and leading out to the OB/OD Area and the range areas beyond is an improved gravel road. Only authorized traffic is allowed to travel down Durand Road to the OB/OD Area. All traffic on Durand Road must check in at the Carr Facility security checkpoint.

- Outer Areas: Access to the active grid areas and ranges is provided by Stark Road, which is the primary access road, and by Burns Road and Highway 101. The latter is a highway in name only. Numerous secondary roads provide for grid operations.

The DPG Motor Pool maintains over 250 sedans, trucks, and carryalls; four buses; 40 construction vehicles such as cranes, graders, and bulldozers; 50 special-purpose test vehicles; and 24 pieces of material handling equipment such as forklifts. Over 2000 privately-owned vehicles are registered on DPG at the Provost Marshal Operations Division Security Office.

The most concentrated vehicle traffic on DPG is in English Village. Traffic volumes at DPG include receiving and shipping trucks which travel primarily to and from the central receiving area, the warehouse area, the ammunition storage area, the fuel area, and the technical area.

Receiving trucks enter DPG through the main gate and are directed to the truck inspection lot, located about 4 1/2 miles from the main gate and half a mile from the main road. From the inspection lot, ammunition trucks are directed to the ammunition area, where the cargo is unloaded. Ammunition used for testing is loaded onto a government truck and transported to the test site.

Transport records for 1988 show an average of 1.92 receiving trucks and 1.73 shipping trucks per day, carrying an average load of 13.46 and 3.02 tons per day, respectively. Information demonstrating the load-bearing capacity of the on-site roads used to transport hazardous waste is not available. These roads were constructed using U.S. Army Corps of Engineers standards. No structural failure of these roads has occurred, even under heavy truck traffic including semi-trucks, as well as an occasional Army tank. DPG has ongoing programs to maintain the internal roadway system.

II.B. WASTE CHARACTERISTICS

The chemical and physical characteristics of various waste ordnance materials to be demilitarized by thermal treatment at the OB/OD Area are described in this section. A waste analysis plan for sampling, testing and evaluating the residual waste remaining after the thermal treatment to ensure that sufficient information is available for safe handling is presented along with an ash management plan. The information submitted is developed in accordance with the requirements of 40 CFR 270(b)(2) and 264.13(a).

II.B1 PHYSICAL AND CHEMICAL CHARACTERISTICS OF WASTES AND RESIDUES: 270.14(b)(2), 264.13(a); R315-8-2.4, R315-3-5(b)(2)

Munitions which are designated for disassembly and subsequent treatment at the OB/OD Area include rejected munitions and components which do not meet appropriate military standards or have been declared unsafe. This declaration may arise as a result of any of the following:

1. The age of the item has exceeded its maximum intended "shelf life."
2. The item appears to be damaged during testing.
3. The item shows evidence of deterioration such as rust.
4. The item has been declared surplus.
5. The item is unexploded ordnance from training operations.

At the present time, OB/OD of propellants, explosives and pyrotechnics (PEP) and PEP contaminated wastes is the fastest, safest, most reliable and the least expensive means of destroying these ordnance items; and the procedures are well understood by depot munitions specialists. In addition, other demilitarization alternatives have consistently given poor results, environmentally.

Prior to thermal treatment in the OB/OD Areas, historical data, specifications, and ordnance publications are used to obtain information regarding the nature of the waste to be burned. Detailed descriptions of military explosives, which may be used to characterize the various PEP compositions present in different munitions and ordnance items, may be found in the Department of Army Technical Manual TM 9-1300-214, titled "Military Explosives."

The principal chemical constituents of the most common PEP wastes, which are thermally treated, are presented in Exhibit II.B-1. Specific PEP formulations vary as to the type and quantity of these constituents. Detailed descriptions of standard military munitions, including the identification of the type and amount of explosive material, are given in various military publications such as Technical Manual TM 43-0001-28, titled "Army Ammunition Data Sheets - Artillery Ammunition, Guns, Howitzers, Mortars, Recoilless Rifles, Grenade Launchers, and Artillery Fuses." Typical chemical compositions of propellants which are most suitable to be thermally treated in the OB area are listed in Exhibit II.B-2. Wastes which would more likely be thermally treated in the OD area are shown in Exhibit II.B-3. In addition, sensitivity characteristics for the various explosive materials are found in the explosive material data sheets presented in Appendix II.B-1.

The categories of wastes to be treated at this installation, as previously indicated, will consist primarily of military energetic materials that have exceeded their shelf life, off-specification versions of these same materials, and unexploded ordnance from training and testing operations at this installation. The off-specification items generally are composed of the same raw materials as the usable items but do not meet some particular performance

EXHIBIT II.B-1
COMPOSITION AND WASTE IDENTIFICATION FOR: PROPELLANTS-EXPLOSIVES-PYROTECHNICS

Component	Chemical Formula	Hazardous Waste ID No.
Propellants: Formulations may be single primary explosive ingredients or combinations with metals, metallic salts and organic polymer binders		
Primary Explosives -		
Nitrocellulose	$C_{12}H_{16}(ONO_2)_4O_6$	D003
Nitroglycerin	$C_3H_5N_3O_9$	D003
Nitroguanidine	$CH_4N_4O_2$	D003
Explosives-Principal: Formulations combine primary explosives, fuels, and oxidizers		
Primary Explosives-		
Lead azide	N_6Pb (71% Pb)	D003, D008
Mercury fulminate (no longer used)	$C_2HgN_2O_2$ (7.05% Hg)	P065, D003, D009
Diazo dinitrophenol (DDNP)	$C_6H_2N_4O_5$	D003
Lead styphnate	$C_6HN_3O_8Pb$	D003, D008
Tetracene	$C_{18}H_{12}$	D003
Potassium dinitro furoxane (KDNBF)	$C_6H_2N_4O_6K$	D003
Lead mononitro resorcinate (LMNR)	$C_6H_3NO_2Pb$ (57.5% Pb)	D003, D008
Fuels-		
Lead thiocyanate	$Pb(SCN)_2$ (64% Pb)	D008
Antimony sulfide	Sb_2S_5	D003
Calcium silicide	$CaSi_2$	D003, D001
Oxidizers-		
Potassium cholrate	$KC10_3$	D003
Ammonium perchlorate	NH_4C10_4	D003
Barium nitrate	BaN_2O_6	D003, D005

EXHIBIT II.B-1 (Cont'd)
COMPOSITION AND WASTE IDENTIFICATION FOR: PROPELLANTS-EXPLOSIVES-PYROTECHNICS

Explosives-Secondary and Boosters: Formulations may combine primary explosives with fuels, oxidizers, and organic polymer binders

Ammonium Nitrate	NH_4NO_3	D003
1,2,4-Butanetriol- trinitrate (BTN)	$C_3H_7N_3O_9$	D003
Diethyleneglycol dinitrate (DEGN)	$C_4H_8N_2O_7$	D003
Nitroglycerin	$C_3H_5N_3O_9$	D003
Nitrostarch	$C_6H_{10}O_5NO_2$	D003
Pentaerythritol tetranitrate (PETN)	$C_5H_8N_4O_{12}$	D003
Triethylene glycodinitrate (TEGN)	$C_6H_{12}O_4N_2O_4$	D003
1,1,1-Trimethylolethane trinitrate (TMETN)	$C_5H_9O_9N_3$	D003
Nitrocellulose	$C_{12}H_{16}(ONO_2)_4O_6$	D003
	$C_4H_8N_8O_2$	D003
Cyclotetramethylene-tetranitramine (HMX)	$C_3H_6N_6O_6$	D003
Cyclotrimethylene-trinitramine (RDX)	$C_2H_6N_4O_4$	D003
Ethylenediamine dinitrate (EDDN Haleite)	$CH_4N_4O_2$	D003
Nitroguanidine	$C_7H_5N_5O_8$	D003
2,4,6-Trinitrophenyl-methylnitramine (Tetryl)		
	$C_6H_3N_3O_7H_3N$	D003
Ammonium picrate (Explosive D)	$C_6H_4N_6O_6$	D003
1,3-Diamino-2,4,6-trinitrobenzene (DATE)	$C_{12}N_8O_{12}$	D003
2,2'4,4'6,6'-hexanitro-azobenzene (HNAB)	$C_{14}H_2N_6O_{12}$	D003
Hexanitostilbene (HNS)	$C_6H_6N_6O_6$	D003
1,3,5-Triamino-2,4,5-trinitrotoluene (TATB)	$C_7H_5N_3O_6$	D003
2,4,6-Trinitrotoluene (TNT)		

Pyrotechnics:

Combinations of:

Oxidizer	-peroxides or perchlorates
Fuel	-powdered aluminium or magnesium
Binding Agents	-resins, waxes, plastics,oils, retardants, waterproofing, color intensifier

Explosives-Plastic Bonded (PBX):

Formulations are combinations of:

Primary Explosives	-from above list
Fuel	-powdered aluminium or iron
Binding Agents	-organic polymer and plasticizer

EXHIBIT II.B-2
WASTES TREATED AT THE OPEN BURN (OB) AREA

Waste Designation	Chemical Composition, WT%	
M1 Propellant	Nitrocellulose	86.00
	Dinitrotoluene	10.00
	Dibutylphtalate	5.00
	Diphenylamine	17.00
M2 Propellant	Nitrocellulose	77.45
	Nitroglycerine	19.50
	Ethyl Centralite	.60
	Barium Nitrate	1.40
	Potassium Nitrate	.75
	Graphite	.30
M5 Propellant	Nitrocellulose	81.95
	Nitroglycerine	15.00
	Ethyl Centralite	.60
	Barium Nitrate	1.40
	Potassium Nitrate	.75
	Graphite	.30
M6 Propellant	Nitrocellulose	87.0
	Dinitrotoluene	10.0
	Dibutylphthalate	3.00
	Diphenylamine	1.00
M7 Propellant	Nitrocellulose	54.60
	Nitroglycerine	35.50
	Ethyl Centralite	.90
	Potassium Perchlorate	.30
	Carbon Black	1.2
M8 Propellant	Nitrocellulose	52.15
	Nitroglycerine	43.00
	Diethylphthalate	3.00
	Ethyl Centralite	.60
	Cryolite	.30
	Potassium Nitrate	1.25
M9 Propellant	Nitrocellulose	57.75
	Nitroglycerine	43.00
	Diethylphthalate	3.00
	Ethyl Centralite	.60
	Cryolite	.30
	Potassium Nitrate	1.25

EXHIBIT II.B-2 (Cont'd)
WASTES TREATED AT THE OPEN BURN (OB) AREA

Waste Designation	Chemical Composition, WT%	
M10 Propellant	Nitrocellulose	98.00
	Dinitrotoluene	1.00
	Potassium Sulphate	1.00
	Graphite	.10
M12 Propellant	Nitrocellulose	97.70
	Diphenylamine	.80
	Potassium Sulphate	.75
	Tin	.75
M13 Propellant	Nitrocellulose	57.30
	Nitroglycerine	40.00
	Diphenylamine	.20
	Ethyl Centralite	1.00
	Potassium Sulfate	1.50
	Carbon Black	.05
M15 Propellant	Nitrocellulose	20.00
	Nitroglycerine	19.00
	Nitroguanidine	54.70
	Ethyl Centralite	6.00
	Cryolite	.30
M16 Propellant	Nitrocellulose	55.50
	Nitroglycerine	27.50
	Dinitrotoluene	10.50
	Ethyl Centralite	4.00
	Potassium Sulfate	1.50
	Carbon Black	.50
	Lead Stearate	.50
M17 Propellant	Nitrocelluloee	22.00
	Nitrogylcerine	21.50
	Nitroguanidine	54.70
	Ethyl Centralite	1.50
	Barium Nitrate	.10
	Cryolite	.30
T2 Propellant	Nitrocelluloee	57.50
	Nitroglycerine	30.00
	Dinitrotoluene	2.50
	Ethyl Centralite	8.00
	Lead Stearate	.50

EXHIBIT II.B-2 (Cont'd)
WASTES TREATED AT THE OPEN BURN (OB) AREA

Waste Designation	Chemical Composition, WT%	
T8 Propellant	Nitrocellulose	58.00
	Nitroglycerine	22.50
	Dinitrotoluene	2.50
	Ethyl Centralite	8.00
	Lead Stearate	.50
	Triacetin	8.50
T23 Propellant	Nitrocellulose	67.25
	Nitroglycerine	25.00
	Ethyl Centralite	6.00
	Barium Nitrate	.75
	Potassium Nitrate	.70
	Graphite	.30
Black Powder	Potassium Nitrate	74.00
	Charcoal	15.60
	Sulfur	10.40

EXHIBIT II.B-3
WASTES TREATED AT THE OPEN DETONATION (OD) AREA

Waste Designation	Chemical Composition, WT%	
Black Powder	Potassium Nitrate Charcoal Sulfur	74.0 15.6 10.4
TNT	Trinitrotoluene	100.0
Composition B	60/40 Cyclotol Cycolonite (RDX) Trinitrotoluene Parafin Wax	 60.0 39.0 17.0
PETN	Pentaerythrite Tetranitrate	100.0
Photoflash	Laminac Lupersol, DDM Iron Oxide	96.8 3.0 .2
Composition C4	Cyclonite (RDX) Polyisobulyene Motor Oil Di-(2-Elhylhexyl)Sebacate	91.0 2.1 1.6 5.3
RDX	Cyclonite [Hexahydro-1,3,5-trinitro-1,3,5-triazine	100.0
Tetryl	Trinitro-Phenylmethyl-Nitramine	100.0
TPA Incendiary	Triethylaluminum	100.0
HMX	Homecyclonite [Cycloteramamethylene Tetranitramine]	100.0
Lead Azide	Lead Azide	100.0
Lead Styphnate	Lead Styphnate	100.0
Amatol	Ammonium Nitrate Trinitrotoluene (TNT)	
Ammonium Nitrate	Ammonium Nitrate	100.0
Composition A3	Cyclonite (RDX) Parafin Wax	91.0 9.0
Explosive A4	Cyclonite (RDX) Parafin Wax	97.0 3.0
Explosive D	Ammonium Picrate	100.0
Haleite	Ethylene-Dinitramine (EDNA)	100.0

EXHIBIT II.B-3 (Cont'd)
WASTES TREATED AT THE OPEN DETONATION (OD) AREA

Waste Designation	Chemical Composition, WT%	
HBX-1,3, & 6	Cyclonite (RDX) Trinitrotoluene Aluminium Densitizer (Comp. D2) CACL	39.6 37.8 17.1 5.0 .5
Octol	Homecyclonite (HMX) Trinitrotoluene	75.0 25.0
PBX	Cyclonite (RDX) Polystyrene Dioctlyphthalate	
Pentolite 50/50	Pentaerythrite Tetranitrite (PETN) Trinitrotoluene (TNT)	50.0 50.0
Pentolite 10/90	Pentaerythrite Tetranitrite (PETN) Trinitrotoluene (TNT)	10.0 90.0'
Picratol	Ammonium Picrate Trinitrotoluene (TNT)	52.0 48.0
Tetrytol	Trinitro-Phenylmethyl-Nitramine Trinitrotoluene (TNT)	
Torpex	Cyclonite (RDX) Trinitrotoluene (TNT) Aluminium	42.0 40.0 18.0
Tritonal	Aluminium Trinitrotoluene (TNT)	
Nitroglycerine	Nitroglycerine	100.0
Nitroguanidine (Picrate)	Picrate	
Military Dynamite-Medium Velocity	Cyclonite (RDX) Trinitrotoluene (TNT) Starch SAE No. 10 Oil Polyisobutylene	75.0 15.0 5.0 4.0 1.0

EXHIBIT II.B-3 (Cont'd)
WASTES TREATED AT THE OPEN DETONATION (OD) AREA

Waste Designation	Chemical Composition, WT%	
Military Dynamite-Low Velocity	Cyclonite (RDX)	17.0
	DYE*	.5
	Trinitrotoluene (TNT)	67.8
	Tripentaery-thritol	8.6
	Binder**	4.1
	Cellulose Acetate	2.0
WP	White Phosphorus	100.0
RP	Red Phosphorus	100.0
Smoke		

* 1-Methylamino-Anthraquinone (1-MA)

** Vistac No. 1 consisting of Polybutene and Diotylseabacate specification, not directly related to chemical composition; e.g., the casing may be dented due to drop testing.

This being the case, the same conclusions, based on published data, can be drawn regarding the appropriate treatment of these off-specification items as would be the case for otherwise normal but surplus items (munitions). If there is a difference in the composition of off-specification materials that may render them unacceptable for OB/OD, other data will be evaluated to resolve the issue. A small test burn of this material may be conducted to provide adequate information on the applicability of OB for this waste. A test burn may also be used to determine acceptability of OB of materials for which little or no historical data exists. However, it should be recognized that test burns and/or complete chemical analysis of the materials in question may not be feasible in all of the aforementioned cases; because of the presumed hazardous nature of the materials.

Since 1986 the U.S. Army Armaments, Munitions and Chemical Command (AMCCOM) has had an active program to evaluate the combustion products, released to air and to soil, from full scale and controlled small scale OB/OD tests. A wide array of munitions were detonated or burned at Tooele Army Depot in Utah in 1986 and the airborne combustion products were sampled by helicopter. Since 1988 extensive testing, sampling and analysis of selected munitions burns and detonations have been conducted at the Dugway Proving Ground. (The OB/OD test site is located approximately ten miles west of the OB/OD Area, which is the subject of this Subpart X permit application.) Controlled and quantitative testing has been done in the facility's newly installed BangBox. Tests at the OB/OD test site were monitored using aircraft for air sampling; the soil likewise been sampled and analyzed in a systematic manner. The OB/OD testing conducted at Dugway is presented in greater detail in Section III.B1., Quality and Physical and Chemical Characteristics of the Waste, of this permit application.

In addition to the environmental concerns associated with the controlled destruction of munitions, special attention must also be given to personnel safety issues. In most cases, information to ensure safe handling of materials to be thermally treated is available in historical data and ordnance publications previously referenced. Munitions sampling would be hazardous in most cases and impossible in others. Some military munitions (particularly bombs and mines) are deliberately constructed so as to make it difficult to disassemble the item without causing it to explode. Other munitions slated for OB or OD have been stored long enough that resulting corrosion would prevent the safe disassembly of the unit. In other cases, the act of removing a sample could result in detonation of the material being sampled. Since the chemical compositions and characteristics of the explosives contained are known from available data, analysis of the munitions prior to demilitarization is not required to provide the information necessary to adequately treat them by OB/OD.

Exact knowledge of the identity of the explosive is normally not necessary if the general type of explosive is known. From the standpoint of treatment by OB/OD, the more important properties would be:

- Sensitivity, so that the material can be handled safely and a proper initiating explosive can be used;
- Fragmentation potential, so that the material can be covered, as necessary, to minimize the hazard from flying fragments; and
- Formation of hazardous fumes.

Since knowledge of the type of explosive will provide this type of information, it is rarely necessary to know the exact chemical composition of the explosives in order to safely treat them by OB/OD.

In the case of materials that have no such information, it may be necessary to perform chemical and physical analyses to determine their reactivity, stability, and ignitability characteristics. These guidelines are provided in the waste analysis plan contained in this permit application. In these cases, the supplying source or generator is responsible for obtaining and verifying the composition information.

Based on the information in Exhibit II.B-4, all of the waste accepted for thermal treatment will be considered hazardous prior to treatment because of its explosive or reactive nature. Full hazard characteristics analyses will not be performed prior to OB/OD to avoid the danger associated with excess handling of such materials and to eliminate costly and potentially dangerous time delays.

II.B2 **WASTE ANALYSIS AND ASH MANAGEMENT PLAN:** 270.14(b)(3), 264.13(b); R315-3-5(b)(3), R315-8-2.4

As previously stated in Section II.B1, all wastes to be treated are potentially explosive and are handled as hazardous material prior to OB/OD. A detailed waste analysis is not necessary to ensure the success of thermal treatment, because the constituents of the PEP waste, as well as its ballistic properties, are well-known prior to treatment. Exhibit II.B-4 contains thermochemical characteristics of some of the PEP materials demilitarized at this site. Exhibit II.B-5 shows the decision process for both the Waste Analysis and Ash Management Plans.

The open burning of explosive materials may generate residual ash. As specified per 40 CFR 261.3(c)(2), any solid waste generated from the treatment of a hazardous waste, including any sludge, spill residue, ash, emission control dust, or leachate is a hazardous waste. However, the residual ash may be shown not to be a hazardous waste if it does not exhibit the characteristics of a hazardous waste in accordance with 40 CFR 261.3(d)(1). Any residual ash remaining in the burn pan or on the ground shall be handled as a hazardous waste until it can be proven to be non-hazardous.

After treatment, the immediate area surrounding the unit is inspected; treatment residues are collected for analysis. Unburned or unexploded PEP materials are treated again by OB or OD. This procedure ensures that any waste treatment residues collected for analysis will not be of an explosive nature. Scrap metal fragments are collected and disposed of in accordance with applicable Army and environmental regulations.

The primary hazard characteristic of the waste residue after thermal treatment will originate from heavy metals and possible traces of the PEP material. All of the waste residues from burning and cleaning of the burn pans are containerized and handled as hazardous waste. They are temporarily stored on-site in a satellite accumulation area, sampled, and analyzed in accordance with this hazardous waste analysis plan and 40 CFR 264. Residues that are verified as hazardous are then disposed of at an off-site, RCRA-permitted hazardous waste disposal facility.

The purpose of the waste analysis plan, therefore, is to gather information that will aid in:

- Characterizing the residue remaining after OB/OD; and
- Subsequent handling, storage, and treatment of this residue.

II.B2.1 <u>Parameters and Rationale</u>: 264.13(b)(1); R315-8-2.4

Since there is a safety hazard posed by the handling and testing of wastes containing relatively high levels of explosives, explosive contaminated wastes are assumed to be reactive in lieu of testing. Therefore, no laboratory analyses are needed to determine physical or chemical characteristics.

EXHIBIT II.B-4
THERMOCHEMICAL CHARACTERISTICS OF EXPLOSIVES

Material	Heat of combustion calories per gram at constant pressure	Heat of formation, kilogram calories per mole	Products of explosion: Heat, calories per gram (H_2O) gas	Products of explosion: Gas, milliliters per gram
Primary Explosives				
Lead azide		-112 to-126.3	367	308
Mercury fulminate	938	-220 to -226	427	315
Diazodinitrophenol	-	956	820	-
Lead styphnate	1,251	92.3	460	440
Tetracene	-	270	658	1,190
Aliphatic nitrate esters				
BTN	2,167	368	1,458	-
DEGN	2,792	-99.4	1,161	-
Nitrocellulose				
Pyroxlyn (12% N)	-	-216	1,020	-
Guncotton (13.55% N)	2,313	-200	1,020	883.2
High Nitrogen (14.14% N)	-	-191	1,810	-
Nitroglycerin	1,603	-90.8	1,486	715
PETN	1,957	-128.7	1,510	790
TEGN	3,428	-603.7	750	-
TMETN	2,642	-422	-	-
Nitramines				
HMX	2,231 to 2,253	11.3 to 179.3	1,480	-
RDX	2,259 to 2,284	14.71	1,480	908
EDDN	2,013	156.1	128 to 159	-
Haleite	2,477	20.11	1,276	908
Nitroguanidine	2,021	20.29	880	1,077
Tetryl	2,914	4.67 to 7.6	1,450	760
Nitroaromatics				
Ammonium picrate	2,745	95.82	800	-
DATB	-	-97.1 to -119	910	-
HNAB	-	-58 to -67.9	1,420	-
HNS	3,451	-13.9 to 1.87	1,360	-
TATB	2,850	-33.46 to -36.85	1,018	-
TNT	3,563 to 3,598	-10 to -19.99	1,290	730
Ammonium nitrate	-	88.6	381	980

In addition to explosive waste, DPG is also seeking a permit to treat certain non-explosive reactive waste constituents at the OB/OD Area. Some munitions contain both explosive waste and components classified as reactive wastes (that do not have the potential to detonate). Such reactive wastes that require treatment include white phosphorous (WP), red phosphorus (RP), hexachloroethane-zinc (HC), and chlorobenzyl-malononitrate (CS). These materials are contained within munitions that also contain explosive waste such as fuses, bursters, and supplemental charges. When misfires, duds, or damage occurs during testing of these types of munitions, the non-explosive components cannot be safely separated from the explosive components. DPG currently treats these wastes at the OB/OD Area only after obtaining special permission from the State of Utah. DPG seeks a permit to treat damaged waste munitions containing WP, RP, HC and CS at the OB/OD Area.

Section II.B of this application describes in detail the specific types of wastes treated in the OB/OD Area.

II.A1.9 <u>Wind Rose</u>: 270.14(b)(1); R315-3-5(b)(19)

A wind rose is provided as Exhibit II.A-5. The data for the wind rose is collected at DPG's Ditto area weather station. The predominant wind direction is southeasterly at night and northwesterly during the day (Reference: DPG Master Plan, p. 3-5). The winds in the vicinity of DPG are strongly influenced by local topographical conditions. These local influences are not noticeable when strong winds, which result from large-scale weather storm patterns, are prevalent. Light winds, primarily of local origin, are generally southeasterly at night and northwesterly in the daytime over the valley floors. The winds near the mountains usually have very different local effects and do not necessarily reflect the general wind patterns (DPG, 1982).

The OB/OD Area is located in a remote area of DPG. The nearest inhabited buildings are located approximately three miles to the northwest at the Carr facility. DPG personnel do not work in or traverse through the immediate vicinity of the OB/OD Area on a regular basis. The closest residences are located in English Village approximately 7.5 miles to the northeast. The nearest property boundary is located approximately 2 miles to the east.

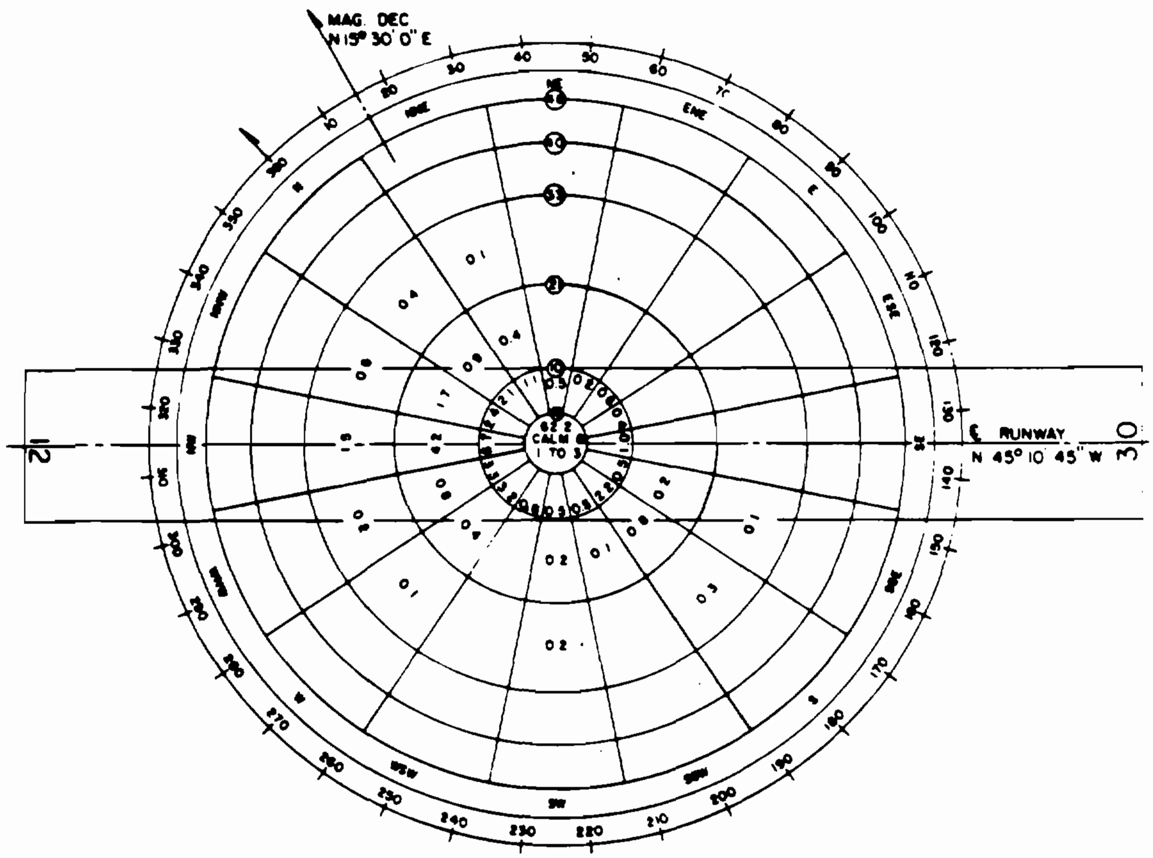
II.A1.10 <u>General Dimensions and Structural Description</u>: 270.14(b)(1); R315-3-5)(b)(1)

The OB/OD Area includes three burn pans where OB is conducted and an oval-shaped cleared area where OD is conducted. Exhibit II.A-4 shows the layout of the OB/OD Area.

One burn pan, installed in 1987, is 5 feet wide by 10 feet long by 1.5 feet high and is constructed of 1/4-inch thick carbon steel boiler plate with fully welded seams. The sides of the pan slope in toward the bottom of the pan to create a slight dish shape, and the interior sides and bottom of the pan are lined with two layers of fire brick. The pan is covered by a hinged steel lid with overlapped, riveted joints. The hinged lid is folded out during open burning. The pan is supported on steel I-Beams that rest on 18-inch square concrete pads. The concrete pads and the I-beams raise the pan approximately 6 inches above the ground.

The other two burn pans, installed in 1992, measure 8 feet wide by 20 feet long by 1.5 feet high. The pans are constructed of 3/4-inch thick carbon steel and are each fitted with a two-piece aluminum cover. The cover is manually removed during open burning. The pans are not lined with any material. These two new burn pans also rest on steel I-Beams to raise the burn pans off the ground.

Exhibit II.A-5: Annual Wind Rose



SURFACE WIND ROSE

MAXIMUM PERCENTAGE OF WIND COVERAGE, BASED ON A 13 MPH CROSSWIND COMPONENT 96.6 %

TOTAL OBSERVATIONS
PERIOD OF RECORD 1943-1945 & 1949-1967
WHERE OBSERVED DITTO WEATHER STATION
SCALE: 0.1" = 2 M.P.H (NTS)
NOTE:

WIND PERCENTAGES DO NOT TOTAL 100 % DUE TO MACHINE RUN DATA IN WHICH ALL FIGURES ARE ROUNDED TO NEAREST 0.1 % CAUSING SOME FRACTIONAL PARTS TO BE DROPPED

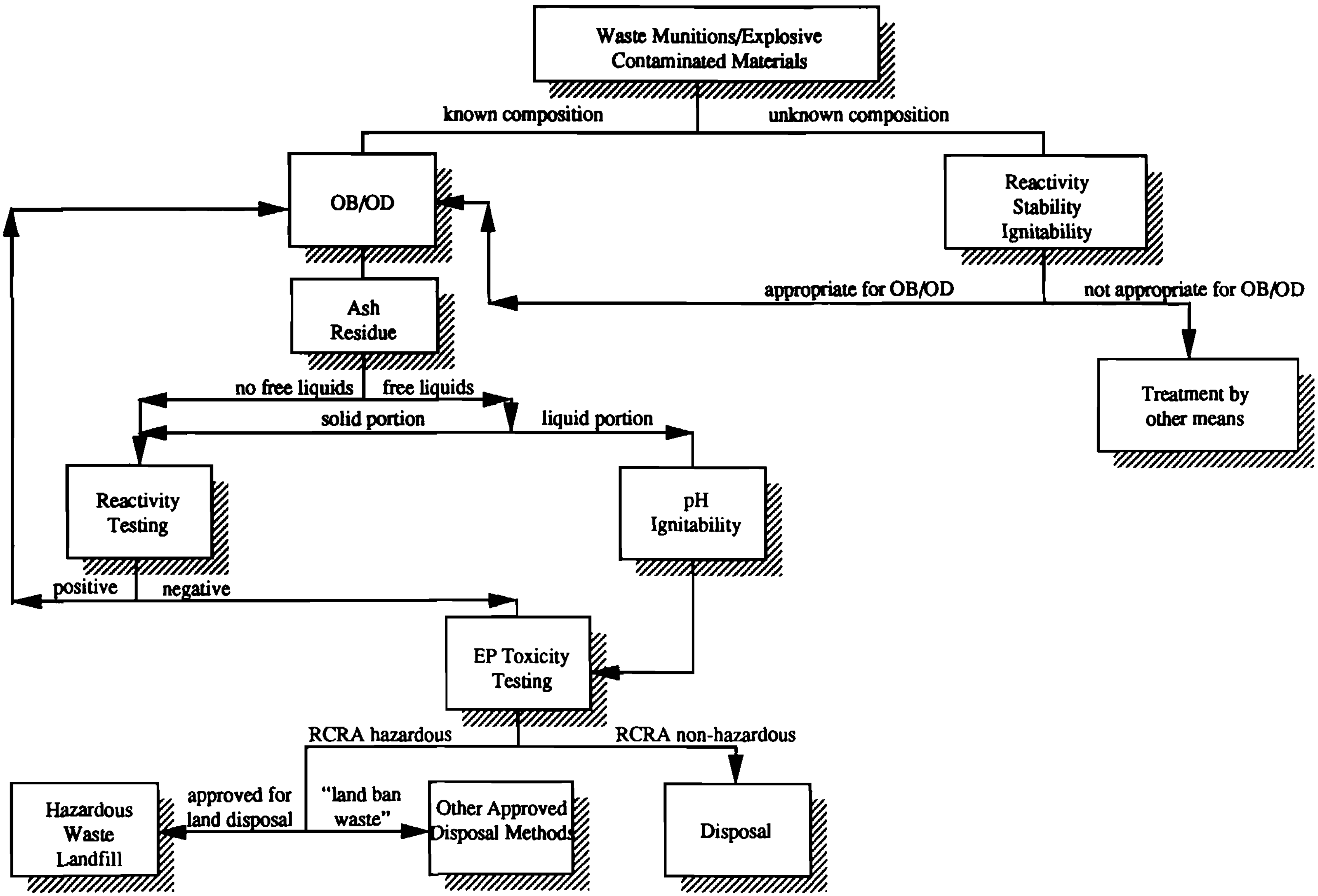
AVERAGE DAILY TEMPERATURE DURING HOTTEST MONTH 94°F OR 34.3°C.

VELOCITY GROUPS

0-3 MPH 62.2 %
4-10 MPH 24 7 %
11-21 MPH 9.8 %
22-33 MPH 3 3 %
34-40 MPH 0.0 %

NTS

Exhibit II.B-5: Waste Analysis Plan Decision Flowchart



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However, the ash resulting from the treatment of these hazardous wastes may require tests to determine other hazardous waste characteristics.

The possible characteristics of the ash resulting from the thermal treatment of waste explosive materials are: (1) reactivity and (2) TCLP toxicity for barium, cadmium, chromium, lead and mercury.

Since the waste destroyed had a reactive characteristic, the ash is tested for reactivity. If the ash is shown to be non-reactive, it will be tested for TCLP toxicity. The TCLP toxicity of the ash, however, is variable with the type and chemical composition of the burned explosives.

II.B2.2 **Analytical Methods**: 264.13(b)(2); R315-8-2.4

Testing will be done using the two test methods which have been developed by the U.S. Bureau of Mines for evaluating wastes for the characteristic of reactivity. They are the "Deflagration to Detonation Transition Test" and the "Gap Test," (I.L. Grant, BUMINES RI6947, May 1967); these tests are presented in Appendix II.B-2. No EPA-approved procedure for detonation reactivity exists at this time.

As mentioned before, waste explosive materials are not sampled or analyzed prior to thermal treatment. Any residual ash that may be generated through thermal treatment operations shall be tested for TCLP toxicity for metals. Sampling shall be accomplished via grab/composite sampling following each OB or OD operation.

The test procedures are listed in Exhibit II.B-6, as well as method numbers and volume requirements. All methods referenced are from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd edition, USEPA, 1986, unless otherwise noted. The laboratory performing these analyses shall operate in accordance with a QA/QC plan that is equivalent to the one detailed in Chapter 1 of SW-846.

II.B2.3 **Sampling Methods**: 264.13(b)(3) and 261, Appendix I; R315-8-2.4

The open burning pan will be sampled each time that it is used. A sample of ambient temperature ash is taken from each side of the pan (four in all), and the samples are then composited. The samples are collected with a non-sparking scoop or thief tube (e.g., brass). Sampling personnel record the location of each sample with respect to permanent sampling locations in the burn pan; e.g., east side, south side, west side, north side. The date, name of sampling personnel, and other pertinent information are also recorded.

EXHIBIT II.B-6
TEST PROCEDURES

Parameter	Analyses	Method Number*	Volume
Free Liquids	Paint Filter Test	9095	100 ml or 100 g
Ignitability	Flash Point	1010	100 ml
pH	pH	9040	30 ml
Reactivity	Gap Test	See Appendix II.B-2	10 g
Reactivity	Deflagration/ Detonation Transition Test	See Appendix II.B-2	20 g
TCLP Toxicity	Extraction	1311	100 g minimum
Arsenic	FAA	7060	
Barium	FLAA	7080	
Cadmium	FLAA	7130	
Chromium	FLAA	7190	
Lead	FAA	7421	
Mercury	CV	7471	
Selenium	FAA	7740	
Silver	FLAA	7760	
2,4-Dinitrotoluene	GC/MS	8270	

FAA = Furnace Atomic Absorption
FLAA = Flame Atomic Absorption
CV = Cold Vapor
GC/MS = Gas Chromatography with Mass Spectrometer

* All methods referenced are from Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd edition, 1986, unless otherwise noted

II.B2.4 Frequency of Analysis: 264.13(b)(4); R315-8-2.4

Ash samples shall be collected and containerized after each burning episode. Actual frequency varies with burning operations. However, analyses shall be performed initially to determine if the ash is hazardous. If it exhibits the characteristics of reactivity or TCLP toxicity, then the ash shall be sampled again upon generating a 55-gallon drum of waste.

II.B2.5 Additional Requirements for Waste to be Disposed of Off-Site: 264.13(b)(5); R315-8-2.4

All hazardous wastes shipped to off-site landfills will meet the requirements of 40 CFR 268.

II.B2.6 Additional Requirements for Waste Generated Off-Site: 264.13(c); R315-8-2.4

No off-site hazardous wastes will be treated at the OB/OD Area.

II.B2.7 Additional Requirements for the Proper Handling of Ignitable, Reactive, and Incompatible Wastes: 264.13(b)(6) and 264.17(c); R315-8-2.4

The information provided in this section is submitted in accordance with the regulatory requirements of 40 CFR 270.14(b)(9). All hazardous materials handled at the OB/OD Area shall be assumed to be reactive due to inherent physical and chemical characteristics. As such, personnel must take appropriate precautions to prevent reactions which:

1. Generate extreme heat, pressure, fire, or explosions, except during OB or OD treatment;
2. Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
3. Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion;
4. Damage the structural integrity of the burn pans; and
5. Through other like means threaten human health or the environment.

The means to accomplish the aforementioned criteria are provided through the establishment of safety guidelines implemented through the SOPs. The safety guidelines include, but are not limited to, the following:

1. No Smoking signs shall be posted at the OB/OD Area.
2. Ignition sources shall be prohibited at the OB/OD Area, except as required to initiate OB or OD treatment.
3. Spark-producing equipment and tools shall be prohibited from use near explosive materials unless specifically authorized.
4. Incompatible materials shall not be treated or stored in the same location.
5. Supervisors shall perform inspections of hand tools and mechanical devices to ensure that they have not become unsafe for their designated use.
6. Motor vehicles used to transport waste explosives, ammunition, or other material to the OB/OD Area shall meet the requirements of AMC-R-385-100, Chapter 22..

7. Thermal treatment operations shall not be conducted during electrical storms.

II.B2.8 <u>**Compatibility of Waste and Container**</u>: 264.172 through 264.177; R315-8-9.3 through R315-8-9.8

Explosive hazardous waste shall only be stored in the original containment device or in U.S. Army/DOD approved containers. Residual ash shall be stored in containers that are compatible with ash. If there is any indication that the ash and container may not be compatible with each other, a polyethylene liner may be used in the waste drum. This will ensure that adverse reactions do not occur.

II.B2.9 <u>**Requirements for Restricted Land Disposal of Hazardous Wastes**</u>: 268; R315-13-1

Waste residues generated by the treatment of hazardous wastes in the OB/OD Area are subject to land disposal restrictions. The waste residues will be stored in the OB/OD satellite accumulation area until volume limits are reached. The containers will then be transported to DPG's RCRA permitted Central Hazardous Waste Storage Facility (CHWSF) for subsequent storage and off-site disposal. Details of the procedures performed in support of land disposal restriction determinations are provided in the Waste Analysis Plan in DPG's existing permit covering the CHWSF.

On-site generators at DPG are responsible for conducting routine waste analysis. These analyses, which are summarized in Exhibit II.B-6, are performed on OB/OD Area treatment residues to determine their hazard characteristics. These same analyses will also serve to determine whether the wastes are restricted from land disposal. The analyses will determine whether the waste residuals meet the applicable treatment standards for the waste extract (using TCLP methods) or will demonstrate that the wastes have been treated by the appropriate specified treatment technology. All analytical information will be forwarded along with the waste residues to the CHWSF for proper subsequent storage and off-site disposal.

As a generator of land disposal restricted waste, DPG will comply with the notification and certification requirements applicable to generators as detailed in 40 CFR 268.7(a). Notification and certification procedures and copies of sample forms that will accompany wastes shipped off-site for disposal are included in the Waste Analysis Plan in DPG's existing RCRA permit covering the CHWSF.

II.B3 **EFFECTIVENESS OF TREATMENT:** 270.23(d); R315-3-6(a)(8)(iv)

The effectiveness of OB/OD treatment is discussed in Section III.B1, Quality and Physical and Chemical Characteristics of the Waste, of this permit application.

APPENDIX II.B-1

EXPLOSIVE MATERIAL DATA SHEETS

DDNP (Diazodinitrophenol)

REFERENCES: Jan-D-552: pg 7-9, TM 9-1300-214: pg 99, AMCP 706-177: HCSDS 40066

FORMULA: $C_6H_2N_4O_5$ (4,5 dinitrobenzene-2-diazo-1 oxide) (dinol)(diazol)

MOLECULAR WT: 210.108
DENSITY: 1.63
MELTING PT (°C): 157

COLOR: greenish yellow to brown
HYGROSCOPICITY: 0.04
RATE OF DETONATION (meters/sec): 7,100 at density 1.63 g/cc

SENSITIVITY

IMPACT (% TNT)
PICATINNY ARSENAL: 2 inches (14)
BUREAU OF MINES: 5 centimeters (5)

PENDULUM FRICTION: 100% Explodes

HEAT (EXPLOSION IN 5 SEC): 180°C

RIFLE BULLET:

GENERAL: As sensitive to impact as mercury fulminate. As sensitive to friction as lead azic
Electrostatic sensitivity: .25 joules

BRISANCE: (% TNT)
SAND TEST: 45.6 grams (94-105)
FRAGMENTATION OF SHELL

PLATE DENT TEST: ____________

STABILITY: Not as stable as lead azide. Stable at 50°C for 30 months. Considered satisfactory for military use.

REACTION W/METALS:

METHODS OF LOADING: Pressed

USES: Percussion caps, detonators, priming compositions, commercial blasting caps

REMARKS: Has replaced mercury fulminate to a large extent in blasting caps
Must be stored wet.
QD Class 1.1
Storage compatibility group A

KDNBF (Potassium Dinitrobenezoforoxane)

REFERENCES: p. 7-16, TM 9-1300-214, pg 302, AMCP 706-177.

FORMULA: $KC_6H_4N_4O_6$

MOLECULAR WT: 264.20
DENSITY: 2.21 g/cc
MELTING PT (°C): 210° (explodes)

COLOR: Red
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 6 inches w/.45 kg wt.
BUREAU OF MINES:

PENDULUM FRICTION: 100% explosions

HEAT (EXPLOSION IN 5 SEC): 250° C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (93)
FRAGMENTATION OF SHELL

PLATE DENT TEST: ____________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Pressed

USES: Primary Compositions

REMARKS: Stored wet

PRIMARY EXPLOSIVE

EAD AZIDE (Pure)

REFERENCES: MIL-L-3055; pg 7-1, TM 9-1300-214; pg 182, AMCP 706-177; pg 14-2, DARCOMR 385-100

FORMULA: $Pb(N_3)_2$

MOLECULAR WT: 291.258
DENSITY: 4.38
MELTING PT (°C): Decomposes at 245-250°C

COLOR: White to buff
HYGROSCOPICITY: 0.8%
RATE OF DETONATION (meters/sec): 5,400 at density 4.68 g/cc

SENSITIVITY

IMPACT (% TNT)
PICATINNY ARSENAL: 5 inches (29)
BUREAU OF MINES: 11 centimeters

PENDULUM FRICTION· 100%

HEAT (EXPLOSION IN 5 SEC): 340°C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 16.7 grams (40)
FRAGMENTATION OF SHELL

PLATE DENT TEST: ______________

STABILITY:

REACTION W/METALS: In presence of moisture, corrodes zinc and copper, and forms extremely sensitive copper azide. (para 14-2a, DARCOMR 385-100)

METHODS OF LOADING: Pressed - aluminum generally used for detonator cups, etc.

USES: Detonators, priming compositions, commercial blasting caps.

REMARKS: Must be stored wet. (distilled water and alcohol)
QD Class 1.1
Storage compatibility group A
Cannot initiate the detonation of relatively insensitive bursting charge such as ammonium picrate or TNT.

Dextrinated Lead Azide (DLA) (Type I)

REFERENCES: p 7-3, TM 9-1300-214

FORMULA: 93% lead azide, 4% lead hydroxide, and 3% dextrin and impurities

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR: Buff
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 4-6 inches (29-43)
BUREAU OF MINES: (13-28)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 340°

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 13.8 grams (38)
FRAGMENTATION OF SHELL

PLATE DENT TEST:________________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: Dextrin is used as a colloiding agent which prevents the formation of large sensitive crystals and regulates crystal shape during manufacture.

SLA (Service Lead Azide)

REFERENCES: P 7-3, TM 9-1300-214

FORMULA:

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR: White
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 2 inches (14)
BUREAU OF MINES: (30)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 350°

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: This form of lead azide is used extensively in the United Kingdom. "Storage [of SLA] underwater is considered hazardous due to the possibility of growth of the crystals and formation of agglomerates which detonate spontaneously." - paragraph 7-2a(2), TM 9-1300-214.

Colloidal Lead Azide (CLA) (Type II Lead Azide)

REFERENCES: P 7-3, TM 9-1300-214

FORMULA:

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 2-3 inches (14-21)

BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 344°

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)

SAND TEST: 15 grams

FRAGMENTATION OF SHELL

PLATE DENT TEST:

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Ideal as a spot charge and a priming charge in low energy electric initiators.

REMARKS: CLA is nondextrinated lead azide of very small particle size.

PVA-LA (Polyvinylalcohol Lead Azide)

REFERENCES: p 7-3, TM 9-1300-214

FORMULA:

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY

IMPACT (% TNT)
PICATINNY ARSENAL: 4-5 inches (29-35)
BUREAU OF MINES: (13-16)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 340°

RIFLE BULLET:

GENERAL: PVA-LA possesses practically the same sensitivity to impact, as DLA, but is much more efficient in detonators.

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST:

STABILITY: Practically nonhygroscopic

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

RD 1333 Lead Azide

REFERENCES: P 7-3, TM 9-1300-214, MIL-L 462225

FORMULA:

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 5 inches (36)
BUREAU OF MINES: 15 cm

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 345°

RIFLE BULLET:

GENERAL:

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: RD 1333 Lead Azide is an insensitive form of lead azide. The method of manufacture as well as some properties of RD 1333 are confidential.

DCLA (Dextrinated Colloidal Lead Azide)

REFERENCES: PS 7-3, TM 9-1300-214

FORMULA:

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 3-6 inches (21-42)
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: DCLA is essentially DLA with a very small particle size.

LMNR (Lead Mononitroresorcinate)

REFERENCES: MIL-L-46496, TM 9-1300-214, page 7-17

FORMULA:

MOLECULAR WT: 360.30
DENSITY: .20 to .35 grams per cm
MELTING PT (°C):

COLOR: Light Brown
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Electric detonators, uppercharge (detonators), primary compositions.

REMARKS: Has slow burning properties and a low combustion temperature. Must be stored and transported underwater with not less than 10% denatured alcohol.

LEAD STYPHNATE (Normal)

REFERENCES: MIL-L-16355; MIL-L-757; pg 7-11, TM 9-1300-214; pg 193, AMCP 706-177 pg 14-2, DARCOMR 385-100.

FORMULA: $PbO_2C_6H(NO_2)_3{\cdot}H_2O$ (lead 2.4,6-trinitioresorcinate)

MOLECULAR WT: 468
DENSITY: 3.02
MELTING PT (°C): Explodes at 260-310°C

COLOR: light orange or reddish brown
HYGROSCOPICITY: 0.05
RATE OF DETONATION (meters/sec): 5.200 at density 2.9 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 3 inches (21)
BUREAU OF MINES: 8 centimeters (8)

PENDULUM FRICTION: 100%

HEAT (EXPLOSION IN 5 SEC): 282°C

RIFLE BULLET:

GENERAL: Particularly sensitive to static electric discharge. Slightly less sensitive to impact than mercury fulminate or DDNP - More sensitive than lead azide.

BRISANCE: (% TNT)
SAND TEST: 10.5 grams (22-53)
FRAGMENTATION OF SHELL

PLATE DENT TEST: ____________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Pressed or wet loaded

USES: Priming compositions

REMARKS: Relatively poor initiator of detonation
Must be stored wet.
QD Class 1.1
Storage compatibility group A

MERCURY FULMINATE

REFERENCES: JAN-M-219; pg 7-5, TM 9-1300-214; pg 201, AMCP 706-177; pg 14-2, DARCOMR 385-100

FORMULA: $Hg(ONC)_2$

MOLECULAR WT: 284.65
DENSITY: 4.42

MELTING PT. (°C): Decomposes

COLOR: Grayish
HYGROSCOPICITY: 0.02
RATE OF DETONATION: (meters/sec):
5,400 at density 4.17 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 2 inches (14)
BUREAU OF MINES: 5 centimeters (5)

PENDULUM FRICTION: 100%

HEAT (EXPLOSION IN 5 SEC): 210°C

RIFLE BULLET:

GENERAL: More sensitive to impact, heat and friction than lead azide or lead styphnate.

BRISANCE: (% TNT)
SAND TEST: 22.1 grams (27.3 - 59)
FRAGMENTATION OF SHELL: —

PLATE DENT TEST

STABILITY: Very low. At 50°C, deteriorates to 92% purity in 2 years.

REACTION W/METALS: Dry - reacts rapidly w/aluminum and magnesium, slowly w/copper, zinc, brass, bronze. Iron, steel not affected. Wet - reacts immediately w/aluminum, magnesium, rapidly w/copper, zinc, brass, bronze. Iron, steel not affected.

METHODS OF LOADING: Pressed

USES: Practically obsolete. Detonators, priming compositions.

REMARKS: Not as efficient initiator of detonation as lead azide and DDNP, Satisfactory when used w/tetryl, RDX, or PETN boosters.

Must be stored wet.
QD Class 1.1
Storage compatibility Group A

TETRACENE

REFERENCES: MIL-T-46938; pg 7-15, TM 9-1300-214; pg 324, AMCP 706-177; pg 14-2, DARCOMR 385-100

FORMULA: $C_2H_8N_{10}O$ (4-guanyl -1-(nitrosoaminoguanyl) -1-Tetrazene)

MOLECULAR WT: 188.16
DENSITY: 1.05
MELTING PT. (°C): Explodes at 140-160°C

COLOR: Colorless or pale yellow
HYGROSCOPICITY: 0.77
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 2 inches (14)
BUREAU OF MINES: 7 centimeters (7)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 154°C

RIFLE BULLET:

GENERAL: As sensitive to impact as mercury fulminate and DDNP

BRISANCE:
SAND TEST: 2.0 grams (pressed at 3,000 PSI) 13.1 grams (unpressed)(40-70
FRAGMENTATION OF SHELL: —
PLATE DENT TEST: ________________

STABILITY: Relatively stable below 75°C. Decomposes rapidly at 100°C.

REACTION W/METALS:

METHODS OF LOADING: Pressed

USES: Priming compositions, detonators

REMARKS: Does not have sufficient initiating efficiency to permit its use as such with military high explosives.
Must be stored wet.
Q.D. Class 1.1
Storage compatibility group A

CH-6

REFERENCES: Mil-C-217-3; pg 8-111; TM 9-1300-214; HCSDS 00628

FORMULA: 97.5% RDX, 1.5% Calcium Stearate, 0.5% Graphite, 0.5% Polyisobutylene

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
8,223 at density ______.

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 12 inches
BUREAU OF MINES:

PENDULUM FRICTION: crackles (steel shoe)

HEAT (EXPLOSION IN 5 SEC): 203°

RIFLE BULLET:

GENERAL: Electrostatic Discharge Test: .112 joules
Matches the sensitivity of tetryl

BRISANCE: (% TNT)
SAND TEST: (128)
FRAGMENTATION OF SHELL

PLATE DENT TEST: ________________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Boosters and leads

REMARKS:

`DX (Cyclonite, Hexagen)

REFERENCES: Mil - R - 398; pg 8-30, TM 9-1300-214; pg 69, AMCP 706-177
pg 14-5, DARCOM 385-100, HCSDS 67

FORMULA: $C_3H_6N_6O_6$ (Hexahydro - 1,3,5 - Trinitro - 5 - triazine)(hexogen) (T4)
(Cyclotrimethylenetrinitramine)

MOLECULAR WT: 222.126
DENSITY: 1.82
MELTING PT (°C): 204.1

COLOR: White
HYGROSCOPICITY: 0.02
RATE OF DETONATION (meters/sec):
8,700 at density 1.77 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 8 inches (57)
BUREAU OF MINES: 33 centimeters (33)

PENDULUM FRICTION: 20% explosions

HEAT (EXPLOSION IN 5 SEC): 260°C

RIFLE BULLET: 100% explosions

GENERAL: Much less sensitive to electtic spark than tetryl, TNT, or PETN. As sensitive to impact as tetryl, more sensitive to friction and bullet impact than tetryl

BRISANCE: (% TNT)
SAND TEST: 59.0 grams (125-145)
PLATE DENT TEST: (135-141)
FRAGMENTATION OF SHELL (141)

STABILITY: Very good. Nearly as stable as TNT. Stable for 10 months at 85°C

REACTION W/METALS: Dry or damp RDX causes very slight corrosion of copper, brass, mild steel or cadmium

METHODS OF LOADING: Pressed

USES: Component of other explosives, detonator base charge, boosters

REMARKS: Second most powerful standard military explosive after nitroglycerin
Type A RDX manufactured from nitric acid process.
Type B RDX manufactured from acetic anhydride process.

Classes of RDX distinguished by granulation
Stored wetted in the U.S. and England
QD Class 1.1
Storage compatibility group D (when wetted)

HMX (Homocyclonite, Octogen)

REFERENCES: Mil - H- 45444; pg 8-27, TM 9-1300-214; pg 173, AMCP 706-177 pg 14-6, DARCOM-R 385-100, HCSDS 129

FORMULA: $C_4H_8O_8$ (1,3,5,7-tetranitro 1,3,5,7-tetrazacyclooctane) (cyclotetramethylene tetranitramine) (homocyclonite)

MOLECULAR WT: 296.17
DENSITY: 1.87
MELTING PT (°C): 276.7

COLOR: White
HYGROSCOPICITY: 0.0
RATE OF DETONATION (meters/sec): 9,110 at density 1.89 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 9 inches
BUREAU OF MINES: 32 centimeters (32)

PENDULUM FRICTION: 100% (steel shoe) unaffected (fiber shoe)

HEAT (EXPLOSION IN 5 SEC): 337°C

RIFLE BULLET:

GENERAL: Same order of sensitivity to impact and friction as RDX.

BRISANCE: (% TNT)
SAND TEST: 60.4 grams (125)
FRAGMENTATION OF SHELL: —

PLATE DENT TEST: __________

STABILITY: More stable than RDX

REACTION W/METALS:

METHODS OF LOADING: cast when mixed with TNT

USES: Seldom used by itself in military explosive applications - ingredient of Octol and HTA-3.

REMARKS: 90% as brisant and 90% as powerful as RDX.
Beta crystal form least sensitive and most often produced.
QD Class 1.1
Storage compatibility group D

PETN (Pentaerythrite Tetranitrate)

REFERENCES: Mil-P-00387; pg 8-16, TM 9-1300-214; pg 276, AMCP 706-177; pg 14-4, DARCOM 385-100, HCSDS 87

FORMULA: $C_5H_8N_4O_2$ (nitro pentaerythrite)

MOLECULAR WT: 316.146
DENSITY: 1.77
MELTING PT (°C): 141.3

COLOR: White
HYGROSCOPICITY: 0.0
RATE OF DETONATION (meters/sec): 8,300 at density 1.77 g/cc

SENSITIVITY

IMPACT (% TNT)
PICATINNY ARSENAL: 6 inches (43)
BUREAU OF MINES: 17 centimeters (17)

PENDULUM FRICTION: 5% explosions

HEAT (EXPLOSION IN 5 SEC): 225°C (decomposes)

RIFLE BULLET: 100% explosions
Electrostatic sensitivity: .036 joules
GENERAL: Relatively insensitive to electric sparks. More sensitive to impact than RDX or tetyl. Less sensitive to friction than RDX

BRISANCE: (% TNT)
SAND TEST: 61.2 grams (129-141) Plate dent test (% TNT) 127
FRAGMENTATION OF SHELL: —

STABILITY: More stable than nitrocellulose or nitroglycerin at elevated temp. Les stable than RDX, tetryl, or TNT.

REACTION W/METALS: Dry- does not corrode copper, brass, aluminum, steel, stainless steel, cadmium, nickel or zinc. Wet causes slight corrosion of brass, cadmium, zinc.

METHODS OF LOADING: Pressed

USES: Detonating cord, w/TNT in pentolite

REMARKS: Considered an initiating explosive by DOT.
Must be shipped w/not less than 40% by weight of water.
QD Class 1.1
Storage compatibility group D

TETRYL

REFERENCES: MIL-T-339; pg 8-45, TM 9-1300-214; pg 335, AMCP 706-177; pg 14-4, DARCOMR 385-100; HCSDS 116

FORMULA: $C_7H_5N_5O_8$ (2,4,6 - Trinitrophenyl methyl nitramine) (tetralite) (Pyronite)

MOLECULAR WT: 287.15
DENSITY: 1.73
MELTING PT. (°C): 129.45

COLOR: light yellow or buff
HYGROSCOPICITY: 0.04
RATE OF DETONATION (meters/sec): 7,850 at density 1.71 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 8 inches (57)
BUREAU OF MINES: 26 centimeters (26)

PENDULUM FRICTION: 0% crackles (steel), unaffected (fiber)

HEAT (EXPLOSION IN 5 SEC): 257°C

RIFLE BULLET: 13% explosion, 54% partials, 10% burned, 23% unaffected

GENERAL: Sensitivity to shock and friction has not been found sufficient to necessitate packing in wet condition, as is required for PETN and RDX.

BRISANCE: (% TNT)
SAND TEST: 54.0 (113-123)
PLATE DENT TEST: (115)
FRAGMENTATION OF SHELL: (121)

STABILITY: Less stable than TNT or RDX, but excellent at less than 120°C. Stable at magazine temperatures for 20 years.

REACTION W/METALS: 0.5% moisture - has some corrosion effect on steel and zinc. little or no effect on copper, tin, lead, nickel, cadmium, aluminum, brass, or bronze.

METHODS OF LOADING: Pressed - frequently used with 1 to 2% of a binding agent or lubricant, such as graphite, stearic acid, or magnesium stearate.

USES: Grade I - detonators, boosters, ingredient of tetrytol
Grade II - ingredient of tetrytol

REMARKS:
Grade I tetryl in 2 classes differentiated by granulation.
90% as brisant and 82% as powerful as PETN and RDX
QD Class 1.1
Storage compatibility group D

AMATEX-20

REFERENCES: 8-124, TM 9-1300-214, ECSDS 00920

FORMULA: 40% TNT, 40% Ammonium Nitrate, 20% RDX

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
6,944 at density 1.61 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (107-129) 15-18 inches
BUREAU OF MINES:

PENDULUM FRICTION: unaffected

HEAT (EXPLOSION IN 5 SEC): 240° C

RIFLE BULLET:

GENERAL: Electrostatic sensitivity 725 joules

BRISANCE: (% TNT)
SAND TEST: —
FRAGMENTATION OF SHELL: —

PLATE DENT TEST:____________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: As a replacement for TNT or Comp B

REMARKS: Developed and loaded into
Ctg, 105mm, HE, M1
Projectile, 155mm, HE, M107
Projectile, 8 inch, HE, M106

Only a few developmental rounds remain - project not carried forward into production.

AMATOL 50/50

REFERENCES: pg 8-27, TM 9-1300-214; pg 16, AMCP 706-177; pg 14-5, DARCOM 385-100
HCSDS 00774

FORMULA: 50% Ammonium nitrate, 50 % TNT

MOLECULAR WT: 118
DENSITY: 1.59
MELTING PT (°C): Same as TNT

COLOR: Buff-yellow
HYGROSCOPICITY: Nil
RATE OF DETONATION (meters/sec):
6,430 at density 1.60 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 16 inches (93-100)
BUREAU OF MINES: 95 centimeters

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 265°C (decomposes)

RIFLE BULLET: Unaffected

GENERAL: Same order of sensitivity as TNT.

BRISANCE: (% TNT)
SAND TEST: 42.5 grams (90)
FRAGMENTATION OF SHELL (82)

Plate Dent Test: (52)

STABILITY: A little less stable than TNT at 100°. and 120°C. Stability at 50°C expected excellent. Hygroscopic

REACTION W/METALS: Dry - slightly affects copper, bronze, lead. In the presence of moisture, corrodes copper, brass, bronze.

METHODS OF LOADING: Cast

USES: Practically obsolete - replaced by Comp B and Pentolite

REMARKS: Believed to form sensitive compounds w/ copper and brass.

\TOL 60/40

REFERENCES: pg 8-97, TM 9-1300-214; pg 14, AMCP 706-177; pg 14-5, DARCOM 385-100
HCSDS 00774

FORMULA: 60% Ammonium nitrate, 40% TNT

MOLECULAR WT: 108
DENSITY: 1.60
MELTING PT (°C): same as TNT

COLOR: Buff-yellow
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
5,760 at density 1.50 g/cc

SENSITIVITY

IMPACT (% TNT)
PICATINNY ARSENAL: 16 inches (93-100)
BUREAU OF MINES: 95 centimeters

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 270°C (decomposes)

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 41.5 grams (90)
FRAGMENTATION OF SHELL (81)

PLATE DENT TEST: ______

STABILITY: *

REACTION W/METALS: *

METHODS OF LOADING: Cast

USES: Obsolete

REMARKS: *

* Information similar to Amatol 50/50

AMATOL 80/20

REFERENCES: pg8-97, TM 9-1300-214; pg 12, AMCP 706-177; pg 14-5, DARCOM 385-100
HCSDS 00774

FORMULA: 80% Ammonium nitrate, 20% TNT

MOLECULAR WT: 92
DENSITY: 1.46
MELTING PT (°C): Same as TNT

COLOR: Buff-yellow
HYGROSCOPICITY: 61
RATE OF DETONATION (meters/sec):
4,500 at density 1.46 g/cc
5,100 at density 1.50 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 15 inches (93-100)
BUREAU OF MINES: 90 centimeters

PENDULUM FRICTION: unaffected

HEAT (EXPLOSION IN 5 SEC): 280°C (decomposes)

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 35.5 grams (74)
FRAGMENTATION OF SHELL: —

PLATE DENT TEST: ______________

STABILITY: *

REACTION W/METALS: *

METHODS OF LOADING: Cast, extrusion

USES: Obsolete.

REMARKS: Difficulties in loading led to change to Amatol 50/50.
*Other information similar to Amatol 50/50.

AMMONAL

REFERENCES: Pg 8-124, TM 9-1300-214; pg 19, AMCP 706-177

FORMULA: 67% TNT, 22% Ammonium nitrate, 11% aluminum

MOLECULAR WT: 102
DENSITY: 1.65
MELTING PT (°C): Same as TNT

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 11 inches
BUREAU OF MINES: 91 centimeters

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 265°C (decomposes)

RIFLE BULLET:

GENERAL: more sensitive than Amatol to initiation.

BRISANCE: (% TNT)
SAND TEST: 47.8 grams
FRAGMENTATION OF SHELL: (84)

PLATE DENT TEST: ______________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Obsolete.

REMARKS:

AMMONIUM NITRATE

REFERENCES: Mil-A-175; pg 8-92, TM 9-1300-214; pg 21, AMCP 706-177
HCSDS 00252

FORMULA: NH_4NO_3

MOLECULAR WT: 80.048
DENSITY: 1.725
MELTING PT (°C): 169.6

COLOR: Colorless
HYGROSCOPICITY: Extreme
RATE OF DETONATION (meters/sec):
2,800 at density 1.0 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 3 Inches (221)
BUREAU OF MINES: 100+ centimeters (100+)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 465°C (ignites)

RIFLE BULLET: Unaffected

GENERAL: So insensitive that it is seldom used along as an explosive.
Electrostatic Discharge Test: 11.025 joules.

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST:______________

STABILITY: Very stable - decomposition does not appear until the compound melts

REACTION W/METALS: In the presence of moisture, reacts w/copper, iron, steel, brass, lead, and cadmium.

METHODS OF LOADING: Pressed or cast depending on composition of mixture

USES: Ingredient of other explosives, cratering charge.

REMARKS: In the presence of moisture, reacts w/ copper to form tetraminocupric nitrate, which is of the same order of sensitivity to impact as lead azide.

QD Class variable
Storage compatibility group variable

COMPOSITION A3

REFERENCES: pg8-100, TM 9-1300-214; pg 43, AMCP 706-177; MIL-C-440, HCSDS 00150, MIL-C-63217 (Type II)

FORMULA: Composition A3: 91% RDX, 9% desensitizing wax, Composition A3 Type II: 90.8 RDX, 9.2 polyethylene

MOLECULAR WT: 227
DENSITY: 1.65 at 12,000 psi
MELTING PT (°C):

COLOR: White - Buff
HYGROSCOPICITY: 0.0
RATE OF DETONATION (meters/sec): 8,200 at density 1.60 g/cc

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 16 inches (125)
BUREAU OF MINES: 100+ centimeters

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 250°C (decomposes)

RIFLE BULLET: Unaffected

GENERAL: Quite insensitive to shock and friction, less sensitive than TNT
Electrostatic Discharge: 9.76 joules

BRISANCE: (% TNT)

SAND TEST: 51.0 grams (107-115) Plate Dent Test: (126)
FRAGMENTATION OF SHELL (150)

STABILITY: Stable, but storage above 75°C has softening effect on wax

REACTION W/METALS: Dry - slightly affects copper, magnesium, brass, and mild steel plated w/cadmium or copper. Wet - Stainless steel unaffected.

METHODS OF LOADING: Pressed

USES: Projectile filler

REMARKS: 132% as powerful as TNT.

Consistency at 70° to 100°C - soft and self binding under light hand pressure.

COMPOSITION A 4

REFERENCES: Mil - C - 440, HCSDS 00311

FORMULA: 97% RDX, 3% wax (desensitizer)

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 13 inches
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected (fiber) crackles (steel)

HEAT (EXPLOSION IN 5 SEC): Approx. 260° C (decomposes)

RIFLE BULLET:

GENERAL: Electrostatic Discharge Test: .153 joules

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST:____________

STABILITY: *

REACTION W/METALS: *

METHODS OF LOADING:

USES: Boosters

REMARKS: * Similar to Composition A3

COMPOSITION A5

REFERENCES: Mil - E - 14970: PG 14-6, DARCOM 385-100, HCSDS 00546

FORMULA: 98.5% RDX, 1.5% Stearic Acid

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 8-12 inches
BUREAU OF MINES:

PENDULUM FRICTION: crackles (steel shoe)

HEAT (EXPLOSION IN 5 SEC): 305° C

RIFLE BULLET:

GENERAL: Electrostatic discharge Test: 11.025 joules

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST (% TNT):

STABILITY: *

REACTION W/METALS: *

METHODS OF LOADING:

USES: Shaped charges, grenades

REMARKS:

*Similar to Composition A3

COMPOSITION A6

REFERENCES: p 8-100, TM 9-1300-214

FORMULA: 86% RDX, 14% Desensitizing Wax

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Projectile filler

REMARKS:

COMPOSITION A7

REFERENCES: HCSDS 00910

FORMULA: 98.4% RDX, 1.6% Wax

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 14 inches
BUREAU OF MINES:

PENDULUM FRICTION: crackles (steel shoe) unaffected (fiber shoe)

HEAT (EXPLOSION IN 5 SEC): approx 26C° C (Decomposes)

RIFLE BULLET:

GENERAL: Electrostatic Discharge Test: 11.025

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

OMPOSITION B

REFERENCES: MIL-C-401; pg 8-103, TM 9-1300-214; pg 46, AMCP 706-177
pg 14-6, DARCOM 385-100; HCSDS 00101

FORMULA: 60% RDX, 39% TNT, 1 % wax (desensitizer)
(See also Cyclotol - RDX/TNT mixture)

MOLECULAR WT: 224
DENSITY: 1.65 cast
MELTING PT (°C): 78-80

COLOR: brownish yellow
HYGROSCOPICITY: 0.02
RATE OF DETONATION (meters/sec):
7,840 at density 1.68 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 13 Inches (100)
BUREAU OF MINES: 75 centimeters (75)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 273°C (decomposes)

RIFLE BULLET: 3% explosions, 13% partials, 4% burned, 80 % unaffected

GENERAL: Slightly more sensitive than TNT, much less sensitive than RDX as shown by impact tests. No more sensitive than TNT to friction. Intermediate between TNT and RDX with respect to sensitivity to initiation. Electrostatic discharge test: 11.03 joules. Cast Composition B is destinctly more sensitive than pressed Comp B.

BRISANCE: (% TNT)
SAND TEST: 53.0 grams (113)
FRAGMENTATION OF SHELL: (142)

PLATE DENT TEST: (129-132)

STABILITY: As stable as RDX, slightly less stable than TNT. Slight exudation when stored at temperatures from 65-71°C.

REACTION W/METALS: Dry - slight corrosion of copper and brass. In the presence of 0.5% Moisture - some corrosion of cadmium and zinc.

METHODS OF LOADING: Cast or pressed

USES: Fragmentation bombs, HE projectiles, grenades, shaped charges.

REMARKS: 131 to 134% as powerful as TNT.
Inferior to tritonol and torpex in blast effect.
2 Grades of Composition B
Grade A - Manufactured from Class A RDX
Grade B - Manufactured from Class B RDX

COMPOSITION B2

REFERENCES: Table 8-66, Pg. 8-103, TM 9-1300-214,

FORMULA: 60% RDX, 40% TNT
(See Cyclotol)

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR: Yellow Brown
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
7,900 at density 1.72 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (14)
BUREAU OF MINES: (75)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (114)
FRAGMENTATION OF SHELL

PLATE DENT TEST: (132)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

COMPOSITION B, MOD 1

REFERENCES: HCSDS 1276

FORMULA: 59.5% RDX, 40% TNT, 5% estane

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 293° C

RIFLE BULLET:

GENERAL: Electrostatic Discharge Test: 1.33 joules

I 'ANCE:
'AND TEST:
FRAGMENTATION OF SHELL

STABILITY: Same as Composition B

EACTION W/METALS:

ETHODS OF LOADING: Cast

SES:

MARKS:

COMPOSITION B, MOD 2

REFERENCES: HCSDS 1277

FORMULA: 59% RDX, 39.8% TNT, 1% Wax, .2% HNS

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 287° C

RIFLE BULLET:

GENERAL: Electrostatic Discharge Test 1.33 joules

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS: Similar to Composition B

METHODS OF LOADING: Cast

USES:

REMARKS:

COMPOSITION B 3

REFERENCES: Mil-C-45113; pg 8-103, TM 9-1300-214; HCSDS 101

FORMULA: 59.5% RDX, 40.5% TNT

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST: ________________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: All information similar to that of Composition B.

COMPOSITION B4

REFERENCES: Mil-C-46652; pg 14-6, DARCOM 385-100, HCSDS 00151

FORMULA: 60% RDX, 39.5% TNT, 0.5% Calcium Silicate

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 16 inches

BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 265° C (509° F)

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)

SAND TEST:

PLATE DENT TEST:

FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

COMPOSITION B5

REFERENCES: p 14-6, DARCOM 385-100, HCSDS 00413

FORMULA: 63% RDX, 34% TNT, 2% elastomer, 1% glyceride of 12 - hydroxy stearic acid

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL: 17 inches
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 265° C (509° F)

RIFLE BULLET:

GENERAL:

U ANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

ETHODS OF LOADING:

SES:

EMARKS:

BARATOL

REFERENCES: pg 29, AMCP 706-177; pg 11-14, TM 9-1300-214

FORMULA: 67% Barium nitrate, 33% TNT

MOLECULAR WT: 125
DENSITY: 2.55
MELTING PT (°C):

COLOR:
HYGROSCOPICITY: 0.0
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 11 inches
BUREAU OF MINES: 35 centimeters

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 385°C (ignites)

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 26.8 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST: (61)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Bomb filler

REMARKS: Developed during WW I with proportions varying to suit required purposes.

OMPOSITION C 3

REFERENCES: MIL-C-427; pg 8-109, TM 9-1300-214; pg 57, AMCP 706-177; pg 14-7 DARCOM 385-100

FORMULA: 77% RDX, 23% Plasticizer (See remarks)

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR: Yellowish
HYGROSCOPICITY: 2.4
RATE OF DETONATION (meters/sec): 7,625 at density 1.60 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 14 inches (100)
BUREAU OF MINES: 100+ centimeters (100+)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 280°C (decomposes)

RIFLE BULLET: 40% partials, 60% unaffected

GENERAL: Same sensitivity to impact as TNT.

ISANCE: (% TNT)
SAND TEST: 53.0 grams (112)
FRAGMENTATION OF SHELL (% TNT): (133)

PLATE DENT TEST (%TNT) (114-118)

STABILITY: Considerable exudation when stored at 77°C. Hardens at -29°C.

REACTION W/METALS: None

METHODS OF LOADING: Hand tamped

USES: Plastic demolition explosive. Because of hardening, high volatility and hygroscopicity, is being replaced by C4.

REMARKS: Plasticizer is explosive w/ following composition:

Tetryl	3%
TNT	4%
DNT	10%
MNT	5%
Nitrocellulose	1%

COMPOSITION C 4

REFERENCES: MIL-C-45010; pg 8-111, TM 9-1300-214; pg 59 AMCP 706-177
pg 14-7, DARCOM 385-100, HCSDS77

FORMULA: 91% RDX, 9% Plasticizer (See remarks)

MOLECULAR WT:
DENSITY: 1.59
MELTING PT (°C):

COLOR: Light brown
HYGROSCOPICITY: Nil
RATE OF DETONATION (meters/sec):
8,040 at density 1.59 g/cc

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 19 inches (100)
BUREAU OF MINES: 100+ centimeters

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 290°C

RIFLE BULLET: 20% burned, 80% unaffected

GENERAL: Less sensitive to impact than Composition C3.
Electrostatic Discharge Test: 11.025 joules (unconfined)

BRISANCE: (% TNT)
SAND TEST: 55.7 grams (116)
FRAGMENTATION OF SHELL

PLATE DENT TEST (115 - 130)

STABILITY: More stable than composition C3 and much less volatile. Does not harden at -57°C and does not exude at 77°C.

REACTION W/METALS: None

METHODS OF LOADING: Hand tamped

USES: Plastic demolition explosive.

REMARKS: Plasticizer is non-explosive w/ following compositions:

Polyisobutylene	2.1%
Motor oil	1.6%
Di-(2-ethyehexyl)-sebacate	5.3%

Note: can cause headache, insomnia, dizziness, restlessness and convulsions resulting from central nervous system stimulation. The convulsions resemble grand mal epileptic seizures.

CYCLOTOL 75/25 (Type I)

REFERENCES: pg 76, AMCP 706-177, pg 8-103, TM 9-1300-214
Mil-C-13477

FORMULA: 75% RDX, 25% TNT

MOLECULAR WT: 224
DENSITY: 1.71
MELTING PT (°C):

COLOR: yellow-buff
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
8,035 at density 1.70 g/cc
7,938 at density 1.71 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET: 30% explosions, 40% partials (smokes) 30% unaffected

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL:

PLATE DENT TEST: __________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Fragmentation bomb, HE projectiles, grenades

REMARKS: Standardized in US early in WW II

CYCLOTOL 70/30 (Type II B)

REFERENCES: pg 79, AMCP 706-177, P 8-103 TM 9-1300-214
Mil-C-13477

FORMULA: 70% RDX, 30 % TNT

MOLECULAR WT: 224
DENSITY: 1.71
MELTING PT (°C):

COLOR: yellow-buff
HYGROSCOPICITY: Nil
RATE OF DETONATION (meters/sec): 8,060 at density 1.73 g/cc

SENSITIVITY
IMPACT
PICATINNY ARSENAL: 14 inches
BUREAU OF MINES: 60 centimeters

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 265°C (decomposes)

RIFLE BULLET: 30% explosions, 30% partials 40% unaffected

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 56.6 grams (118)
FRAGMENTATION OF SHELL: (161)

PLATE DENT TEST (% TNT) (136)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES:

REMARKS: Other information similar to Cyclotol 75/25

CYCLOTOL 69.6/29.9 (Type II B)

REFERENCES: pg 8-103, TM 9-1300-214, MIL-C-13477

FORMULA: 69.6 ± 2% RDX, 29.9 ± 2 % TNT, .5 ± .15% calcium silicate

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

CYCLOTOL 65/35

REFERENCES: pg 81, AMCP 706-177
MIl-C-13477

FORMULA: 65% RDX, 35% TNT

MOLECULAR WT: 224
DENSITY: 1.71
MELTING PT (°C):

COLOR: yellow-buff
HYGROSCOPICITY: Nil
RATE OF DETONATION (meters/sec): 7,975 at density 1.72 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 270°C (decomposes)

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 55.4 grams (126)
FRAGMENTATION OF SHELL (% TNT) (150)

PLATE DENT TEST (% TNT): __________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Bombs, HE projectiles, grenades

REMARKS:

CYCLOTOL 60/40

REFERENCES: pg 83, AMCP 706-177
Mil-C-13477

FORMULA: 60% RDX, 40% TNT

MOLECULAR WT: 224
DENSITY: 1.68
MELTING PT (°C):

COLOR: yellow-buff
HYGROSCOPICITY: Nil
RATE OF DETONATION (meters/sec):
7,900 at density 1.72 g/cc

SENSITIVITY
IMPACT
PICATINNY ARSENAL: 14 inches
BUREAU OF MINES: 75 centimeters

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 280°C (decomposes)

RIFLE BULLET: 5% explosions, 55% partials, 25% burned, 15% unaffected

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 54.6 grams (125)
FRAGMENTATION OF SHELL (136)
PLATE DENT TEST :(132)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Bombs, HE projectiles, grenades

REMARKS: Identical to composition B2

DATB (Diamino - Trinitrobenzene) (DATNG)

REFERENCES: pg 8-61, TM 9-1300-214; pg 95, AMCP 706-177; HCSDS 1194

FORMULA: $C_6H_5N_5O_6$

MOLECULAR WT: 243.14
DENSITY: 1.79 g/cc
MELTING PT (°C): 286°-301°

COLOR: Yellow
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
7585

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (200)
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 540° (1004° F)

RIFLE BULLET:

Electrostatic Discharge Test: .045 - 1.125 joules
GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST: (120)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Pressed

USES: Used as a pressed explosive or as a ballistic modifier in some rocket propellants.

REMARKS:

DBX (Depth Bomb Explosive)

REFERENCES: PG 91, AMCP 706-177; pg 14-6, DARCOM 385-100; pg 8-129, TM 9-1300-214

FORMULA: 40% TNT, 21% RDX, 21% Ammonium nitrate, 18% aluminum

MOLECULAR WT: 83
DENSITY: 1.68
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
6,800 at density at 1.76 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 13 inches (71)
BUREAU OF MINES: 35 centimeters

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 400°C (ignites)

RIFLE BULLET:

GENERAL: Closely resembles torpex in sensitivity, strength, and brisance.

BRISANCE: (% TNT)
SAND TEST: 58.5 grams (112)
FRAGMENTATION OF SHELL: —

PLATE DENT TEST: (102)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Depth charge

REMARKS: Replaced by torpex and derivatives of torpex

DEGN (Dietheleneglycol Dinitrate)

REFERENCES: TM 9-1300-214; pg 8-1

FORMULA: $C_4H_8N_2O_7$

MOLECULAR WT: 196
DENSITY: 1.38 g/cm^3
MELTING PT (°C): 2° C

COLOR: Colorless liquid
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
6,760

SENSITIVITY
IMPACT
PICATINNY ARSENAL: 9 inches
BUREAU OF MINES: 100+

PENDULUM FRICTION: Explodes

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

URISANCE:
SAND TEST: (% TNT)(100)
FRAGMENTATION OF SHELL —

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Use as explosive or used in propellants as a colloiding agent for nitrocellulose.

REMARKS:

EX

REFERENCES: NAVSEA OP 3613 (Confidential)

FORMULA: Similar to Tritonal.

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: —
FRAGMENTATION OF SHELL: —

PLATE DENT TEST: ______________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

EDDN (Ethylenediamine dinitrate) (EDD)(EDAD)

REFERENCES: p 8-38, TM 9-1300-214

FORMULA: $C_2H_{10}N_4O_6$

MOLECULAR WT: 186.13
DENSITY: 1.577 g/cc
MELTING PT (°C): 185-187°

COLOR: Colorless
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec): 6,800

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (64)
BUREAU OF MINES: (79)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 445° C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (96)
FRAGMENTATION OF SHELL

PLATE DENT TEST: (100)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast or pressed

USES: Has been used to a limited extent as a bursting charge pressed in shells and as a cast charge in eutectic mixtures with ammonium nitrate.

REMARKS:

NATOL 55/45

REFERENCES: pg 8-112TM 9-1300-214; pg 130, AMCP 706-177

FORMULA: 55% Haleite, 45% TNT

MOLECULAR WT: 178
DENSITY: 1.62
MELTING PT (°C): 80

COLOR: yellow
HYGROSCOPICITY: none
RATE OF DETONATION (meters/sec): 7,340 at density 1.63 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: —
BUREAU OF MINES: 95 centimeters (95)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 190°C (decomposes)

RIFLE BULLET: 7% burned, 93% unaffected

GENERAL: Sensitivity to impact greater than TNT, less than Haleite

BRISANCE: (% TNT)
SAND TEST: (112) 49.6 grams
FRAGMENTATION OF SHELL: (118)

PLATE DENT TEST: (112)

STABILITY: Same order of stability as Haleite at 100°C - much less stable than Haleite at 120°C.

REACTION W/METALS: Dry-very slight corrosion of copper, brass, mild steel and zinc. In presence of 0.5% moisture, corrosion more pronounced and cadmium and nickel affected.

METHODS OF LOADING: Cast

USES: Projectiles, bombs, special ammunition components. Obsolete.

REMARKS: As an explosive for producing blast effect, it is superior to amatol, pentolite, and composition C-3 and nearly equal to composition B.

EXPLOSIVE D (Ammonium Picrate)

REFERENCES: Mil-A-166; pg 8-55, TM 9-1300-214; pg 136, AMCP 706-177; pg 14-5, DARCOM 385-100, ECSDS 00905

FORMULA: $C_6H_6N_4O_7$ (Ammonium 2,4,6 - trinitrophenolate)

MOLECULAR WT: 246.14
DENSITY: 1.719
MELTING PT (°C): 265-271

COLOR: yellow-orange
HYGROSCOPICITY: 0.1
RATE OF DETONATION (meters/sec): 2,154 at density 1.63 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (121) 17 inches
BUREAU OF MINES: (100+)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 318°C (decomposes)

RIFLE BULLET: 30% burned, 70% unaffected

GENERAL: Distinctly less sensitive to impact than TNT. Relatively insensitive to initiation
Electrostatic Discharge Test: 6.0 joules (confined) .025 joules (unconfined)

BRISANCE: (% TNT)
SAND TEST: (78-82.5) 36.8 grams
FRAGMENTATION OF SHELL (99)

PLATE DENT TEST: (91)

STABILITY: At least as stable as TNT at 150°C

REACTION W/METALS:

METHODS OF LOADING: pressed

USES: AP projectiles and bombs, ingredient of picratol

REMARKS: Manufactured in two Classes differentiated by granulation
Class A - intended for use in press loading of shell.
Class B - intended for use in manufacture of picratol

Note: Explosive D is considered highly toxic by inhalation, ingestion, or skin absorption.

GSX - Gelled Slurry Explosives

REFERENCES: 8-135, TM 9-1300-214

FORMULA: 50% Ammonium nitrate, 30% Aluminum, 14% water, 6% binder-stabilizer

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST: ______________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: BLU-82/B 15,000 lb bomb

REMARKS: Composition obtained from Airforce Conventional Munitions Engineering Section (AV 458-7056), Hill Airforce Base.

HALEITE

REFERENCES: pg 8-39, TM 9-1300-214; pg 150, AMCP 706-177

FORMULA: $(CH_2NHNO_2)_2$ (Ethylenedinitramine) (N,N' - Dinitroethylene) (EDNA)

MOLECULAR WT: 150.10
DENSITY: 1.71
MELTING PT (°C): 175 decomposes

COLOR: White
HYGROSCOPICITY: 0.01
RATE OF DETONATION (meters/sec): 7,883 at density 1.55 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 10 inches
BUREAU OF MINES: 43 centimeters (48)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 189°C (decomposes)

RIFLE BULLET: 60% partials, 20% burned, 20% unaffected

GENERAL: more sensitive than TNT, but less sensitive than tetryl to impact.

BRISANCE: (% TNT)
SAND TEST: 52.0 grams (109-119)
FRAGMENTATION OF SHELL: (117-147)
PLATE DENT TEST: (113-122)

STABILITY: Satisfactory stability. Very slightly less stable than tetryl at 100° and 120° C

REACTION W/METALS: In presence of 0.5% moisture, considerably corrodes brass, copper, mild steel, cadmium, nickel, zinc.

METHODS OF LOADING: Pressed

USES: Booster, an ingredient of Ednatol. Obsolete.

REMARKS:

HBX - 1

REFERENCES: MIL-E-22267, pg 8-125, TM 9-1300-214; pg 156, AMCP 706-177; pg 14-6, DARCOM 385-100

FORMULA: 39.6% RDX, 37.8% TNT, 17.1% Aluminum, 5% Desensitizer 0.5% Calcium Chloride (See Remarks)

MOLECULAR WT:
DENSITY: 1.72
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY: 2.98
RATE OF DETONATION (meters/sec): 7,222 at density 1.75 g/cc

SENSITIVITY

IMPACT (% TNT)
PICATINNY ARSENAL: 16 inches (75)
BUREAU OF MINES: —

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 480° C

RIFLE BULLET: 73% explosions, 27% Unaffected

GENERAL: Less sensitive to impact and initiation than both torpex and Composition B.

BRISANCE: (% TNT)
SAND TEST: 48.1 grams (102)
PLATE DENT TEST : ___________
FRAGMENTATION OF SHELL : (129)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES:

REMARKS: Desensitizer designated Composition D2 with ingredients as follows:
84 % Paraffin and other waxes
14 % nitrocellulose
2 % lecithim

Essentially a modification of torpex.

HBX - 3

REFERENCES: MIL-E-22267; pg 8-125, TM 9-1300-214; pg 159, AMCP 706-177, pg 14-6, DARCOM 385-100

FORMULA: 31% RDX, 29% TNT, 35% Aluminum, 5% D-2 Wax (See HBX-1)
0.5% Calcium Chloride

MOLECULAR WT: 64
DENSITY: 1.84
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY: 2.01
RATE OF DETONATION (meters/sec):
6,920 at density 1.86 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 15 inches (70)
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET: 78% explosions, 22% unaffected

GENERAL: Lower sensitivity than torpex

BRISANCE: (% TNT)
SAND TEST: 44.9 grams (93.5)
FRAGMENTATION OF SHELL: (68)

PLATE DENT TEST:

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES:

REMARKS: Essentially a modification of torpex

H-6 (HBX-6)

REFERENCES: MIL-E-22267; pg 8-125, TM 9-1300-214; pg 146, AMCP 706-177 pg 14-6, DARCOM 385-100, HCSDS 00829

FORMULA: 45% RDX, 30% TNT, 20% aluminum, 5% D-2 wax (See HBX-1) 0.5% Calcium Chloride

MOLECULAR WT:
DENSITY: 1.74
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY: 2.01
RATE OF DETONATION (meters/sec): 7,190 at density 1.71 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 14 inches
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 610° C

RIFLE BULLET: 80% explosions, 20% unaffected

GENERAL: Lower sensitivity than torpex.

Electrostatic Discharge Test: .076 joules

BRISANCE: (% TNT)
SAND TEST: 49.5 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST:

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES:

REMARKS: Essentially a modification of torpex.

Note: Highly toxic by inhalation or ingestion.

HNS (Hexanitrostilbene)

REFERENCES: p 8-62, TM 9-1300-214, BCSDS 896

FORMULA: $C_{14}H_6N_6O_{12}$

MOLECULAR WT: 450.24
DENSITY: 1.72 g/cc
MELTING PT (°C): 316°

COLOR: Yellow
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec): 7,000

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (50)
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 369° C (696° F)

RIFLE BULLET:

GENERAL: Practically insensitive to electrostatic spark.

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST: (120)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Used in PBXs, mild detonating fuse and couplers and end boosters, and as a heat resistant booster explosive.

REMARKS: Autoignition point: 325° C

HTA-3

REFERENCES: MIL-E-46495; pg 8-126, TM 9-1300-214; pg 178, AMCP 706-177
HCSDS 630

FORMULA: See remarks

MOLECULAR WT: 91
DENSITY: 1.90
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
7,866 at density 1.90 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 17 inches (121)
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 370°C (flames erratically)

RIFLE BULLET: 90% explosions, 10% burned - 3/16" steel
50% explosions, 50% unaffected - 1/8" aluminum

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 61.3 grams (128)
FRAGMENTATION OF SHELL (% TNT)

PLATE DENT TEST (% TNT):

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES:

REMARKS: Type I: 49% HMX, 29% TNT, 22% Aluminum
Type II: 49% HMX, 28.65% TNT, 22% Aluminum, .35% calcium silicate

LX-14

REFERENCES: MIL-H-48358; pg 8-112, TM 9-1300-214; HCSDS 1043

FORMULA: 95% HMX, 4.5% Polyurethane Elastomer

MOLECULAR WT:
DENSITY: 1.83 g/cc
MELTING PT (°C): 270°+

COLOR: White Solid with Violet Spots
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 13 inches
BUREAU OF MINES:

PENDULUM FRICTION: crackles (steel shoe) unaffected (fiber shoe)

HEAT (EXPLOSION IN 5 SEC): 310° C (590° F)

RIFLE BULLET:

Electrostatic Discharge Test: .25 joules +

GENERAL:

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

NOL - 2

REFERENCES: MIL-M-14745; pg 8-126, TM 9-1300-214; pg 209, AMCP 706-177

FORMULA: 40% Ammonium nitrate, 40% TNT, 20% Aluminum

MOLECULAR WT: 71
DENSITY: 1.62-1.68
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
6,200 at density 1.77 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 13 inches (93)
BUREAU OF MINES: 35 centimeters (35)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 224 - 260° C

RIFLE BULLET:

GENERAL: More sensitive to shock than TNT or tritonal.

BRISANCE: (% TNT)
SAND TEST: (86)
FRAGMENTATION OF SHELL (% TNT):

PLATE DENT TEST (% TNT): (66)

STABILITY:

REACTION W/METALS: Presence of moisture causes reaction between ammonium nitrate and aluminum

METHODS OF LOADING: Cast

USES: Bombs and depth charges

REMARKS: May be considered as Amatol 50/50, to which has been added 25% aluminum. Considerably more powerful than TNT or tritonal - greater blast and shock effects.

MOX - 2B (Metal Oxidizer Explosives)

REFERENCES: pg 215, AMCP 706-177

FORMULA: 35% Ammonium perchlorate, 52.4% Atomized Aluminum, 1.9% Calcium Stearate, 1.0% Graphite; 5.8% RDX and 3.9% TNT coated on Ammonium perchlorate

MOLECULAR WT: 42
DENSITY: 2.0
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 12 inches
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 375°C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 11.5 grams
FRAGMENTATION OF SHELL: (% TNT)

PLATE DENT TEST (% TNT): ____

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Pressed

USES: HE filler for small caliber projectiles, black powder substitute for spotting charges.

REMARKS:

OCTOL 70/30 (Type II)

REFERENCES: MIL-O-45445; pg 8-114, TM 9-1300-214; pg 249, AMCP 706-177
HCSDS 00154

FORMULA: 70% HMX, 30% TNT

MOLECULAR WT: 265
DENSITY: 1.80
MELTING PT (°C):

COLOR: Buff
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
8310-8377 at density 1.80 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 18 Inches (136)
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 335° C (flames erratically)

RIFLE BULLET:

GENERAL:

Electrostatic Discharge Test: 11.025 joules

BRISANCE: (% TNT)
SAND TEST: 58.4 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST:

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: HE projectile and bomb filler

REMARKS: Octol is prepared by adding wet HMX to molten TNT. The composition is either directly cast into ammunition components or prepared in the form of chips to be stored for later use.

OCTOL 75/25 (Type I)

REFERENCES: MIL-O-45445; pg 8-114, TM 9-1300-214, pg 254, AMCP 706-177

FORMULA: 75% HMX, 25% TNT

MOLECULAR WT: 276
DENSITY: 1.81
MELTING PT (°C):

COLOR: Buff
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
8364-8643 at density 1.81 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 17 inches (170)
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 350°C (flames erratically)

RIFLE BULLET: 70% explosions, 30% unaffected

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 62.1 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST: ________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: He projectile and bomb filler

REMARKS: See Octol 70/30 remarks.

- PBX (Redesignated PB-RDX - plastic bonded RDX)

REFERENCES: pg 8-129, TM 9-1300-214; pg 259, AMCP 706-177; pg 14-7, DARCOM 385-100

FORMULA: 90% RDX, 8.5% poly styrene (unmodified), 1.5% dioctylphthalate

MOLECULAR WT: 245
DENSITY: 0.81 unpressed
MELTING PT (°C):

COLOR: white
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 15 inches
BUREAU OF MINES: 28 centimeters

PENDULUM FRICTION: unaffected

HEAT (EXPLOSION IN 5 SEC): 275° C (smokes)

RIFLE BULLET: 10% explosions, 90% partials

GENERAL:

BRISANCE: (% TNT)

SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST:

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: pressed

USES:

REMARKS: See also Picatinny Arsenal Purchase Description X-PA-PD-1088, 25 Oct 56

See also US Atomic Energy Commission Report No. LA-1448.

PBXN-4

REFERENCES: MIL-P-23625; PS 14-7, DARCOM 385-100, HCSDS 1195

FORMULA: 94% DATB, 6% Nylon

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
7,800 at density ___________

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): Unknown

RIFLE BULLET:

Electrostatic Discharge: 9+ joules

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL:

PLATE DENT TEST: ___________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

PBXN-5 (Explosive, Plastic Bonded Molding Powder)
(LX-10)

REFERENCES: MIL-E-81111; pg 14-7, DARCOM 385-100, HCSDS 00622

FORMULA: 95% HMX, 5% Copolymer (vinylidine fluoride and hexafluoropropylene)

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR: White with Blue Green Spots
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 14 inches
BUREAU OF MINES:

PENDULUM FRICTION: crackles (steel shoe)

HEAT (EXPLOSION IN 5 SEC): 318° C (604° F)

RIFLE BULLET:

Electrostatic sensitivity Test: 11.025 joules

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL

PLATE DENT TEST: ________________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

PBXN-6

REFERENCES: WS-12604, HCSDS 00994

FORMULA: 95% RDX, 5% VITON A

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

Electrostatic Discharge Test: .25 joules

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS:

PENTOLITE 50/50

REFERENCES: JAN-P-408; pg 8-117, TM 9-1300-214; pg 272, AMCP 706-177 HCSDS 00253

FORMULA: 50% PETN, 50% TNT

MOLECULAR WT: 265
DENSITY: 1.65
MELTING PT (°C): 77

COLOR: yellow-white
HYGROSCOPICITY: none
RATE OF DETONATION (meters/sec): 7,402 at density 1.62 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 13 inches (86)
BUREAU OF MINES: 29 centimeters (34)

PENDULUM FRICTION: unaffected

HEAT (EXPLOSION IN 5 SEC): 220°C (decomposes)

RIFLE BULLET: 72% explosions, 20% partials, 8% unaffected

GENERAL: May be considered to approximate the sensitivity of tetryl. The presence of rust or grit has increased its sensitivity.

Electrostatic Discharge Test: Approx 0.06 joules

BRISANCE: (% TNT)
SAND TEST: 54.0 grams (114)
PLATE DENT TEST: (126)
FRAGMENTATION OF SHELL: (131)

STABILITY: Satisfactory. Slightly less stable than PETN. Undergoes some exudation above 50° C.

REACTION W/METALS: In presence of 0.5% moisture, slight action on copper, brass, zinc.

METHODS OF LOADING: Cast and pressed

USES: shaped charges

REMARKS: Manufactured in 2 grades.
Grade I used for melt loading.
Grade II used for pellets and press loading.
Present trend is toward replacement of pentolite by Composition B.

PICRATOL

REFERENCES: pg 8-121, TM 9-1300-214; pg 285, AMCP 706-177; pg 14-6, DARCOM 385-100

FORMULA: 52% Explosive D, 48% TNT

MOLECULAR WT: 236
DENSITY: 1.62
MELTING PT (°C):

COLOR: Brown-yellow
HYGROSCOPICITY: 0.02
RATE OF DETONATION (meters/sec): 6,970 at density 1.67 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 14 inches (100)
BUREAU OF MINES: 100+ centimeters (100+)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 285°C (decomposes)

RIFLE BULLET: 40% burned, 60% unaffected

GENERAL: As sensitive to impact as TNT

BRISANCE: (% TNT)
SAND TEST: 44.6 grams (94)
FRAGMENTATION OF SHELL: (102)

PLATE DENT TEST: (100)

STABILITY: Very slightly less than either TNT or Explosive D.

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: AP, SAP projectiles and bombs.

REMARKS: Toxicity: See TNT and Explosive D.

PLASTIC BONDED HMX

REFERENCES: MIL-P-50854;, pg 14-6, DARCOM 385-100

FORMULA: 95% HMX, 5% plastic binder (EXON 461)

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL (% TNT)

PLATE DENT TEST (% TNT):________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Intended to be pelletized for use as the main charge of the XM41 grenade.

REMARKS:

TATB (Triamino - trinitrobenzene) (TATNB)

REFERENCES: pg 8-66, TM 9-1300-214

FORMULA: $C_6H_6N_6O_6$

MOLECULAR WT: 258.18
DENSITY: 1.9
MELTING PT (°C):

COLOR: Yellow
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
8,000 at density 1.9 g/cc
7,500 at density 1.8 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (79)
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 520° C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (90)
FRAGMENTATION OF SHELL

PLATE DENT TEST: __________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Pressed

USES: Used in plastic explosives and in explosive mixtures with cast TNT. Major milit[illegible] use is in special applications in warheads of high speed guided missiles.

REMARKS:

TEGN (Triethylene Glycoldinitrate)

REFERENCES: TM 9-1300-214, pg 8-22

FORMULA: $C_6H_{12}N_2O_8$

MOLECULAR WT: 240.20
DENSITY: 1.335 g/cm^3
MELTING PT (°C): -19° C (Solid)

COLOR: Light Yellow, Oily Liquid
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (307)
BUREAU OF MINES: (100+)

PENDULUM FRICTION: 0

HEAT (EXPLOSION IN 5 SEC): 225° C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (30.6)
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Component in liquid explosives, plasticizer in fabrication of flexible explosive sheets, plasticizer in pyrotechnic flare mixtures.

REMARKS:

SECONDARY EXPLOSIVES: BURSTING

no - trinitrobenzene) (TATNB)

pg 8-66, TM 9-1300-214

$_6H_6N_6O_6$

258.18

C):

COLOR: Yellow

HYGROSCOPICITY:

RATE OF DETONATION (meters/sec):

8,000 at density 1.9 g/cc

7,500 at density 1.8 g/cc

ec):

% TNT)

NNY ARSENAL: (79)

OF MINES:

FRICTION:

LOSION IN 5 SEC): 520° C

LE

: TNT)

: (90)

ION OF SHELL

PLATE DENT TEST: __________

[TEST: __________

rry at temperature

TALS:

Wet-copper,

affected.

ADING: Pressed

n plastic explosives and in explosive mixtures with cast TNT. Major military in special applications in warheads of high speed guided missiles.

ations.

rsters.

linitrate)

pg 8-22-

-177, pg 14-7,

COLOR: Light Yellow, Oily Liquid
HYGROSCOPICITY:

to buff
lid)
RATE OF DETONATION (meters/sec):

.02
(meters/sec):
at density 1.61 g/cc
307)
)0+)

):225° C

DENT TEST (118)

plosives, plasticizer in fabrication of flexible explosive
pyrotechnic flare mixtures.

is.

r U.S. military use.

TETRYTOL 75/25

REFERENCES: pg 8-121, TM 9-1300-214, pg 343, AMCP 706-177

FORMULA: 75% Tetryl, 25% TNT

MOLECULAR WT: 270
DENSITY:
MELTING PT (°C): 68°

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
7,290-7,410

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 11 inches (78)
BUREAU OF MINES: 28 cm (28)

PENDULUM FRICTION: cracks (steel shoe) unaffected (fiber)

HEAT (EXPLOSION IN 5 SEC): 310° C ignites

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 53.7 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST: (118)

STABILITY: See 65/35 Tetrytol

REACTION W/METALS:

METHODS OF LOADING:

USES: Bursting charge, Demolition explosive

REMARKS: See 65/35 Tetrytol

TNT

REFERENCES: MIL-T-248; pg 8-72, TM 9-1300-214; pg 350, AMCP 706-177, pg 14-7, DARCOM 385-100, HCSDS 33

FORMULA: $C_6H_2CH_3(NO_2)_3$ (2,4,6,- trinitrotoluene)

MOLECULAR WT: 227.134
DENSITY: 1.654
MELTING PT (°C): 80.75

COLOR: Light yellow
HYGROSCOPICITY: 0.03
RATE OF DETONATION (meters/sec): 6,826 at density 1,636

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 14 inches (100)
BUREAU OF MINES: 100+ centimeters (100)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 475° C (decomposes)

RIFLE BULLET: 4% explosions, 96% unaffected

GENERAL: One of the least sensitive of military high explosives - only ammonium picrate, nitroguanidine, and ammonium nitrate are less sensitive.

NUISANCE: (% TNT)
SAND TEST: 47.5 grams (100)
FRAGMENTATION OF SHELL: (100)
PLATE DENT TEST: (100)

STABILITY: Chemical stability excellent - but tends to exude at elevated temperatures

REACTION W/METALS: Causes slight or very slight corrosion of lead, no effect on copper, tin, iron, steel, zinc, cadmium, nickel, brass, or bronze.

METHODS OF LOADING: Cast or pressed.

USES: GP bombs, HE projectiles, demo charges, depth charges, grenades, propellant compositions, ingredient of other explosives.

REMARKS: Manufactured in 2 grades.

Grade I - used for loading shells and bombs, and manufacture of demo blocks and binary explosives.

Grade II - used in priming compositions or special compositions that require either high purity or fine crystalline form.

TORPEX 1

REFERENCES: pg 8-128, TM 9-1300-214; pg 359, AMCP 706-177; pg 14-7, DARCOM 385-100

FORMULA: 42% RDX, 40% TNT, 18% Aluminum

MOLECULAR WT: 97
DENSITY: 1.81
MELTING PT (°C):

COLOR: Gray
HYGROSCOPICITY: 0.0
RATE OF DETONATION (meters/sec): 7,600 at density 1.81 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 8 inches
BUREAU OF MINES: 40 centimeters

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 260°C (decomposes)

RIFLE BULLET: 20% explosions, 80% partials

GENERAL: Considerably more sensitive than Composition B

BRISANCE: (% TNT)
SAND TEST: 58.2 grams (122)
FRAGMENTATION OF SHELL: (126)
PLATE DENT TEST: (120)

STABILITY: Moisture in composition results in liberation of gas which may rupture ammunition component or increase sensitivity to shock.

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: Depth charges, bombs, torpedoes.

REMARKS: Produces more blast effect than any other standard bursting charge explosive.

Essentially aluminized cyclotol 50/50

TORPEX 2

REFERENCES: pg 362, AMCP 706-177; pg 14-7, DARCOM 385-100; pg 8-128, TM 9-1300-214

FORMULA: 41.6% RDX, 39.7% TNT, 18% aluminum, 0.7% wax.

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
7,660 at density 1.8 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (50)
BUREAU OF MINES: (75)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (122)
FRAGMENTATION OF SHELL: (120)

PLATE DENT TEST: (120)

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: Made by addition of aluminum to Composition B.

Wax lowers sensitivity to impact.

See Torpex 1 for other information.

TORPEX 3

REFERENCES: pg 362, AMCP 706-177; pg 14-7, DARCOM 385-100

FORMULA: 41.4% RDX, 39.5% TNT, 17.9% aluminum, 0.7% wax, 0.5% Calcium Chloride

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST:
FRAGMENTATION OF SHELL (% TNT)

PLATE DENT TEST:____________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: Made by the addition of Calcium chloride to Torpex 2.

Calcium chloride absorbs residual moisture.

See Torpex 1 for other information.

ITONAL 80/20

REFERENCES: 8-123, TM 9-1300-214; pg 386, AMCP 706-177; pg 14-7, DARCOM 385-100
HCSDS 479

FORMULA: 80% TNT, 20% Aluminum

MOLECULAR WT: 81
DENSITY: 1.72
MELTING PT (°C): Same as TNT

COLOR: Gray
HYGROSCOPICITY: 0.0
RATE OF DETONATION (meters/sec):
6,770 at density 1.76 g/cc

SENSITIVITY

IMPACT (% TNT)

PICATINNY ARSENAL: 10 inches (71)

BUREAU OF MINES: 73 centimeters (73)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 470°C (decomposes)

RIFLE BULLET: 60% explosions, 40% unaffected

GENERAL: Somewhat more sensitive to impact than TNT, less sensitive than tetryl

Electrostatic Discharge Test: .013 joules

BRISANCE: (% TNT)

SAND TEST: 46.0 grams (114)

FRAGMENTATION OF SHELL: (91)

PLATE DENT TEST: (93)

STABILITY: Same as TNT, if free from moisture.

REACTION W/METALS:

METHODS OF LOADING: Cast

USES: GP Bombs

REMARKS:

MILITARY DYNAMITE

LOW VELOCITY

REFERENCES: pg 122, AMCP 706-177; pg 8-135, TM 9-1300-214

FORMULA: 17.5% RDX/Dye, 67.8% TNT, 8.6% Tripentaerythitol, 4.1% Vistac No 1/ DOS binders, 2.0% cellulose acetate

MOLECULAR WT:
DENSITY: loading 0.9
MELTING PT (°C):

COLOR: pink
HYGROSCOPICITY: none
RATE OF DETONATION (meters/sec): 14,400 ft/sec
4,397 m/sec. at density 0.9 gm/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 22 inches
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): Ignites 480°C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 40.5 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST:__________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Hall packer machine loaded

USES: Military construction, quarrying, service demolition work.

REMARKS:

MILITARY DYNAMITE

MEDIUM VELOCITY

REFERENCES: pg 8-135, TM 9-1300-214; pg 125, AMCP 706-177

FORMULA: 75% RDX, 15% TNT, 5% Grade SAE No 10 engine oil plus polyesobutylene
5% cornstarch

MOLECULAR WT:
DENSITY: loading 1.1
MELTING PT (°C):

COLOR: Buff
HYGROSCOPICITY: None
RATE OF DETONATION (meters/sec): 20,000 ft/sec
6000–6600 m/sec at density 1.1 gm/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 18 inches
BUREAU OF MINES: 100 centimeters

PENDULUM FRICTION: Steel shoe (crackles) Fiber shoe (unaffected)

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET: 10% burned, 90% unaffected

GENERAL:

BRISANCE: (% TNT)
SAND TEST: 52.6 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST:____________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Hall - packer machine loaded

USES: Military Construction, quarrying, service demolition work.

REMARKS: Differences between models:
M1 - 1.25" dia x 8" long
M2 - 1.5 " dia x 8" long
M3 - 1.5 " dia x 12 " long
Turning of shipping containers in storage is not necessary

NITROCELLULOSE (BLENDED)

REFERENCES: MIL-N-244; pg 8-4, TM 9-1300-214

FORMULA: 13.15-13.25% nitrogen

MOLECULAR WT:
DENSITY:
MELTING PT (°C):

COLOR: White
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (21)
BUREAU OF MINES: (8)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL: Same as pyrocellulose

BRISANCE: (% TNT)
SAND TEST: 48.0 grams (99)
FRAGMENTATION OF SHELL

PLATE DENT TEST:_______________

STABILITY: Same as pyrocellulose.

REACTION W/METALS:

METHODS OF LOADING:

USES:

REMARKS: Blended nitrocellulose is a mixture of pyrocellulose and gun cotton. Blended nitrocellulose is used for manufacture of propellants. See following sheets for other forms of nitrocellulose. Nitrocellulose graded and typed IAW the following:

Grade A	Pyrocellulose	
Type I	12.60 ± 0.10% nitrogen	
Type II	12.60 ∓ 0.15% nitrogen	
Grade B	Guncotton	13.35% nitrogen minimum
Grade C	Blended	
Type I	13.15 ± 0.05% nitrogen	

HIGH EXPLOSIVE INGREDIENTS OF PROPELLANT

N.)CELLULOSE (PYROCELLULOSE)

REFERENCES: MIL-N-244A, pg 8-3, TM 9-1300-214; pg 226, AMCP 706-177

FORMULA: 12.60% nitrogen

MOLECULAR WT: 272.39
DENSITY:
MELTING PT (°C): Decomposes

COLOR: White
HYGROSCOPICITY: 3
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 3 inches (21)
BUREAU OF MINES: 8 centimeters (8)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 170° C (decomposes)

RIFLE BULLET:

GENERAL: Almost as sensitive to impact as mercury fulminate. As sensitive to initiation as lead azide. Never handled in quantity, as such, in US.

Electrostatic Discharge: .1238 joules (unconfined)

BRISANCE: (% TNT)
SAND TEST: 45.0 grams (94)
FRAGMENTATION OF SHELL

PLATE DENT TEST:

STABILITY: Deteriorates rapidly in the presence of moisture.

REACTION W/METALS:

METHODS OF LOADING:

USES: propellant ingredient - used in blended nitrocellulose.

REMARKS:

HIGH EXPLOSIVE INGREDIENTS OF PROPELLANT

NITROCELLULOSE (GUNCOTTON)

REFERENCES: MIL-N-244; pg 8-3, TM 9-1300-214; pg 227, AMCP 706-177

FORMULA: 13.35% nitrogen minimum

MOLECULAR WT: 286.34
DENSITY:
MELTING PT (°C): Decomposes

COLOR: White
HYGROSCOPICITY: 2
RATE OF DETONATION (meters/sec): 7,300 at density 1.30 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 3 inches (21)
BUREAU OF MINES: 9 centimeters (9)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC): 230°C

RIFLE BULLET:

GENERAL: Same as pyrocellulose

BRISANCE: (% TNT)
SAND TEST: 49.0 grams (102)
FRAGMENTATION OF SHELL (% TNT): ________

PLATE DENT TEST (% TNT): ________

STABILITY: Same as pyrocellulose.

REACTION W/METALS:

METHODS OF LOADING:

USES: Propellant ingredient - used in blended nitrocellulose

REMARKS:

HIGH EXPLOSIVE INGREDIENTS OF PROPELLANT

NITROGLYCERIN

REFERENCES: MIL-N-246; pg 8-9, TM 9-1300-214; pg 233, AMCP 706-177, HCSDS 00030, pg 14-8, DARCOM 385-100

FORMULA: $C_3H_5N_3O_9$ (glyceryl trinitrate)

MOLECULAR WT: 227.09
DENSITY: 1.596 at 20 C
MELTING PT (°C): 13.2

COLOR: Colorless liquid
HYGROSCOPICITY: 0.06
RATE OF DETONATION (meters/sec):
7,700 at density 1.6 g/cc
can be made to detonate at rates as low as 1500-2000.

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 1 inch (7)
BUREAU OF MINES: 15 centimeters (16)

PENDULUM FRICTION: 100% explosion

HEAT (EXPLOSION IN 5 SEC): 222°C

RIFLE BULLET: 100% explosion

GENERAL: Solid much less sensitive than liquid. Increase in temperature greatly increases liquid sensitivity.

BRISANCE: (% TNT)
SAND TEST: 51.5 grams (liquid method) (120)   PLATE DENT TEST:____________
FRAGMENTATION OF SHELL

STABILITY: Quite stable at less than 50° C. At 100 °C is the least stable of military non-initiating high explosives. Freezing of nitroglycerine (13.5° C) should be avoided as thawing may produce internal changes and sufficient heat to cause explosion.

REACTION W/METALS: Does not cause significant corrosion. Rust increases decomposition.

METHODS OF LOADING:

USES: Propellant ingredient, commercial dynamite, medically for coronary ailments.

REMARKS: Pure nitroglycerin is not transported by common carrier because of its sensitivity.
Readily absorbed through skin - results in severe and persistent headache.

HIGH EXPLOSIVE INGREDIENTS OF PROPELLANTS

NITROGUANIDINE

REFERENCES: MIL-N-494; pg 8-42, TM 9-1300-214; pg 239, AMCP 706-177

FORMULA: $CH_4N_4O_2$ (picrite)

MOLECULAR WT: 104.074
DENSITY: 1.715
MELTING PT (°C): 232

COLOR: Colorless
HYGROSCOPICITY: none
RATE OF DETONATION (meters/sec): 8,100 at density 1.70 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 26 inches
BUREAU OF MINES: 47 centimeters (47)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 275°C (decomposes)

RIFLE BULLET: Unaffected

GENERAL: One of the least sensitive of military explosives.

BRISANCE: (% TNT)
SAND TEST: 36.8 grams 73.5-84)
FRAGMENTATION OF SHELL

PLATE DENT TEST: (95)

STABILITY: Same order of stability as TNT.

REACTION W/METALS:

METHODS OF LOADING:

USES: Propellant ingredient - added only to double base propellant.

REMARKS: Manufactured in 2 classes differentiated by granulation.

Gasses produced by explosion of nitroguanidine propellants are less errosive th[illegible] those produced by other propellants of comparable force.

BTN (1, 2, 4 or Butanetriol Trinitrate)

REFERENCES: TM 9-1300-214, pg 8-1

FORMULA: $C_4H_7N_3O_9$

MOLECULAR WT: 241.1
DENSITY:
MELTING PT (°C): -27° C

COLOR: Light Yellow Liquid
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (7)
BUREAU OF MINES: (16)

PENDULUM FRICTION:

HEAT (EXPLOSION IN 5 SEC):

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (103)
FRAGMENTATION OF SHELL

PLATE DENT TEST: ____________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Substitute for nitroglycerine in double base propellants.

REMARKS: Good gelatinizer for nitrocellulose.

DNT (Dinitrotoluene)

REFERENCES: HCSDS 00439

FORMULA: $C_7H_6N_2O_4$

MOLECULAR WT: 1.82
DENSITY: 1.521 g/cc
MELTING PT (°C): 71° C

COLOR: Yellow
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL:
BUREAU OF MINES:

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 310° C (590° F)

RIFLE BULLET:

Electrostatic Discharge Test: 12.5+ joules

BRISANCE:
SAND TEST:
FRAGMENTATION OF SHELL

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Pressed, exuded, or cast

USES: Ingredient of propellant powder, dynamites and plastic composition.

REMARKS: Highly toxic by ingestion, inhalation or absorption.

TEGN (Triethylene glycoldinitrate)

REFERENCES: Pg 8-22, TM 9-1300-214, pg 367, AMCP 706-177

FORMULA: $C_6H_{12}N_2O_8$

MOLECULAR WT: 240.20
DENSITY: 1.33 g g/km
MELTING PT (°C):

COLOR: Yellow Liquid
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):
2,000 at 1.33 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: (307)
BUREAU OF MINES: (100+)

PENDULUM FRICTION: Unaffected

HEAT (EXPLOSION IN 5 SEC): 225° C

RIFLE BULLET:

GENERAL:

BRISANCE: (% TNT)
SAND TEST: (30.6)
FRAGMENTATION OF SHELL

PLATE DENT TEST:________________

STABILITY: Better than that of nitroglycerine or nitrocellulose.

REACTION W/METALS:

METHODS OF LOADING:

USES: Primarily used as a gelatinizing agent for nitrocellulose in propellants. Can also be used as a component in a liquid explosive, a plasticizer in the fabrication of flexible explosive sheets, and as a plasticizer in pyrotechnic flares.

REMARKS: TEGN is extremely toxic and should be considered a potent poison when absorbed through the skin or ingested.

TMETN (1, 1, 1 - Trimethylolethane Trinitrate) (MTN) (TMEN)

REFERENCES: Pg 8-26, TM 9-1300-214; HCSDS 01193

FORMULA: $C_5H_9N_3O_9$

MOLECULAR WT: 255.15
DENSITY: 1.47 g/cc
MELTING PT (°C): -3° C

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY
IMPACT
PICATINNY ARSENAL: 20 inches (1 lb weight)
BUREAU OF MINES: 47 cm

PENDULUM FRICTION: Explodes (steel shoe)

HEAT (EXPLOSION IN 5 SEC): 235° C (455° F) ignites

RIFLE BULLET:

GENERAL: Electrostatic Discharge: .025 joules

BRISANCE: (% TNT)
SAND TEST: 91
FRAGMENTATION OF SHELL

PLATE DENT TEST:__________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING:

USES: Can be used as a flash and erosion reducing additive in propellants.

REMARKS: Slightly toxic by ingestion; inhalation and absorption. Absorption and inhalation cause lowering of blood pressure and increase heart action.

BLACK POWDER (POTASSIUM NITRATE)

REFERENCES: MIL-P-223; pg 2-2, TM 9-1300-214; pg 36, AMCP 706-177 pg 14-7, DARCOM 385-100, HCSDS 00020

FORMULA: 74% Potassium nitrate, 10.4% sulphur, 15.6% charcoal

MOLECULAR WT: 84
DENSITY: Variable
MELTING PT (°C):

COLOR: Black
HYGROSCOPICITY: 1.91
RATE OF DETONATION (meters/sec): 400 at density 1.6 g/cc

SENSITIVITY
IMPACT (% TNT)
PICATINNY ARSENAL: 16 inches
BUREAU OF MINES: 32 centimeters

PENDULUM FRICTION: Snaps (steel shoe) ; unaffected (fiber shoe)

HEAT (EXPLOSION IN 5 SEC): 427 C° (ignites)

RIFLE BULLET:

GENERAL: Less sensitive to impact than tetryl. Highly sensitive to ignition by flame or electric spark.

Electrostatic Discharge Test: 0.8 joules (confined) 712.5 joules (unconfined)

BRISANCE: (% TNT)
SAND TEST: 8 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST:____________

STABILITY: Highly stable in the absence of moisture.

REACTION W/METALS: Dry - compatible with all metals when moisture content is less than 0.20% . Wet - attacks all common metals except stainless steel.

METHODS OF LOADING: Loose, pressed.

USES:

REMARKS: See also pages later in this handout.

BLACK POWDER (POTASSIUM NITRATE)

REFERENCES: MIL-P-223B(3), Chapter 6, TM 9-1300-214; pg 14-7, DARCOM 385-100

DIVIDED INTO 9 CLASSES BASED ON GRANULATION.

COMPOSITION:

CONSTITUENT	Class 1-7 and Class 9	Class 8
Potassium nitrate	74.0 ± 1.0%	74.0 ± 2.0%
Sulphur	10.4 ∓ 1.0%	10.4 ∓ 1.5%
Charcoal	15.6 ∓ 1.0%	15.6 ∓ 1.5%

INTENDED USE:

Class 1 - Rocket motor igniters, artillery primers, igniter pads

Class 2 - Rocket motor igniters, ignition ends for bag charges, primers, propellant charges for line throwing guns.

Class 3 - Rocket motor igniters, ejection charges for base ejection shell, pyrotechnic items

Classes 4 and 5 - Rocket motor igniters, relay pellets, igniting charge for illuminating candles, charges in target practice shell, ejection charges for base ejection shell, igniter charges in primer detonators, fuze delay elements, tracer igniters.

Classes 6 and 7 - Rocket motor igniters, relay pellets, delay and igniter charges in primer detonators, delay elements, practice hand grenade fuzes, Navy squibs

Class 8 - Propellant charges for rocket signals

Class 9 - Depth charge cartridges

TM 9-1300-214, page 6-3, Table 6-1 has old designations of classes.

BLACK POWDER (POTASSIUM NITRATE) (Continued)

CONVERSION

Old	New
Grade A-1	1
Grade A-2	1-2
Cannon	2
Grade A-3	3-4
Grade A-3a	3-4
Musket	4
FFG	4
Grade A-4	5
Shell	6
FFFG	6
Grade A-5	7
Fuze	7
FFFFG	7
Grade A-6	8
Grade A-7	8
Meal	8

Grades A-1 thru A-7 are old Army designations.

Others are old Navy designations.

NOTE: Some old to new classes do not convert directly and some overlap may exist.

BLACK POWDER (SODIUM NITRATE)

REFERENCES: JAN-P-362; Chapter 6, TM 9-1300-214; pg 14-7, DARCOM 385-100

Divided into 3 classes based on granulation.

COMPOSITION:

CONSTITUENT	ALL CLASSES
Sodium nitrate	72.0 ± 2.0%
Sulphur	12.0 ± 2.0%
Charcoal	16.0 ± 2.0%

INTENDED USE:

Class A - Saluting Charges

Class B - Practice Bombs

Class C - Torpedo impulse charges

BLACK POWDER SUBSTITUTES

BENITE

REFERENCES: MIL-B-45451B(3), pg 6-5, TM 9-1300-214

COMPOSITION

Nitrocellulose	40 ± 1%
Potassium nitrate	44.3 ± 1%
Sulphur	6.3 ± 0.3%
Charcoal	9.4 ± 0.3%
Ethyl Centralite (added)	0.5 ± 0.1%

Uses: Igniter compositions of artillery primers or in base igniter bags for separate loading ammunition.

POWDER, IGNITER CLEAN BURNING (CBI Powder)

References: MIL-P-60356A(2)

Composition

	Type I	Type II
NC	98	98
DPA	1.50 ± 0.20	1.50 ± 0.20
Potassium Nitrate (added)	.1 max	
Graphite (glaze added)	.2	.3

Uses: Artillery igniters

Remarks: Type I is a solid porous flake, Type II is a perforated non-porous flake.

EC Blank Fire Powder

REFERENCES: , Pg 128, AMCP 706-177

FORMULA: 80% NC, 8% Barium Nitrate, 8% Potassium Nitrate, 3% Starch, .75% Diphenylamine, .25% Aurine

MOLECULAR WT: 503
DENSITY:
MELTING PT (°C):

COLOR:
HYGROSCOPICITY:
RATE OF DETONATION (meters/sec):

SENSITIVITY

IMPACT

PICATINNY ARSENAL: 20 inches
BUREAU OF MINES:

PENDULUM FRICTION: snaps (steel shoe)

HEAT (EXPLOSION IN 5 SEC): 200° C decomposes

RIFLE BULLET:

GENERAL:

BRISANCE:
SAND TEST: 46.8 grams
FRAGMENTATION OF SHELL

PLATE DENT TEST:______________

STABILITY:

REACTION W/METALS:

METHODS OF LOADING: Loose

USES: Grenades; caliber, 30 blank

REMARKS:

APPENDIX II.B-2

SUMMARY OF BUREAU OF MINES REACTIVITY TESTS

SUMMARY OF BUREAU OF MINES REACTIVITY TESTS

1. GENERAL

The Bureau of Mines has developed two procedures to be used to analyze a sample for reactivity. These two tests are detailed in Sections 2 and 3 below. These tests were developed to determine if solid wastes exhibit the following reactive hazardous characteristics cited in 40 CFR 261.23(a)(6) and (7):

a. Capable of detonation or explosive reaction if subjected to a strong initiation source or if heated under confinement.

b. Readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

2. DEFLAGRATION TO DETONATION TRANSITION TEST

a. The experimental arrangement for this Bureau of Mines test is shown in Figure II.B-2. The sample of material to be tested is contained in an 18-in (45.7 cm) length of 3-in diameter in a Schedule 80 carbon steel pipe with inside diameter of 2.9-in (7.37 cm), wall thickness 0.30-in (0.76 cm), capped at both ends with "3,000 lb" forged steel pipe caps.

b. The sample is subjected to the thermal and pressure stimulus generated by an ignitor consisting of 0.7 oz (20 g) of grade FFFg black powder located at the center of the sample vessel. The ignitor assembly consists of a cylindrical container 0.81-in (2.06 cm) in diameter and 2.5-in (6.4 cm) long, which is held together by two layers of nylon filament reinforced cellulose acetate tape. The ignitor capsule contains a small loop formed from a 1-in (2.54 cm) length of nickel-chromium alloy resistance wire 0.012-in (0.030 cm) in diameter, having a resistance of 0.343 ohms. This loop is attached to two insulated copper-tinned lead wires 0.026-in (0.066 cm) in diameter. The overall wire diameter including insulation is 0.05-in (0.127 cm). These lead wires are fed through small holes in a brass disc approximately 0.4-in (1 cm) in diameter and 0.03 (0.08 cm) thick, which is soldered to the end of a 9-in (23 cm) length of 1/8-in steel pipe having a diameter of 0.405-in (1.03 cm), which is threaded at the other end and screwed into a threaded hole on the inside of one of the pipe caps. This pipe supports the ignitor capsule and serves as a channel for the ignitor wires. The ignitor is fired by a current of 15 amperes obtained from a 20-volt transformer.

c. The criterion currently used in the interpretation of this test is that for a positive result, either the pipe or at least one of the end caps be fragmented into at least two distinct pieces, that is, results in which the pipe is merely split or laid open, or in which the pipe or caps are distorted to the point at which the caps are blown off, are considered to be negative results. Although it may be argued that a small number of fragments does not indicate the development of a detonation, it at least indicates a very rapidly rising pressure which in a larger sample could lead to development of detonation.

3. U.S. GAP TEST

a. The apparatus for the U.S. Gap Test, the second Bureau of Mines reactivity test, is shown in Figure II.B-3. The test sample is contained in a cylinder consisting of a 16-in (40.6 cm) length of 1 1/2-in Schedule 80 black seamless steel pipe. A steel witness plate, 6-in (15.24 cm) square and 0.125-in (0.32 cm) thick is mounted at the upper end of the sample tubing and separated from it by spacers 0.062-in (0.16 cm) thick. The bottom of the cylinder is closed with two layers of 0.003-in (0.008 cm) thick polyethylene sheet held in place with gum rubber bands and polyvinyl chloride electrical insulating tape. There is no other gap between the pentolite booster and the test sample as used in this test. A continuous velocity detonation probe made of thin aluminum tube with an axial resistance wire having a resistance of 7.62 ohms/in (3.0 ohm/cm) is mounted on the wall of the sample tubing. The outer tubing of the probe is crimped against the inner wire at the lower end forming a resistor. When this assembly is inserted in a medium which transmits a shock wave, the outer wall crushes against the inner wire, as the wave moves up the tubing shortening the effective length and changing the resistance. If a constant current (usually 0.06 amperes) is made to flow between the outer and inner conductors, the voltage between them is proportional to the effective length and can be recorded as a function of the time using an oscilloscope. The slope of the oscilloscope trace is thus proportional to the velocity of the shock wave.

b. The apparatus for the gap test for liquids is the same as that for solids except that a method of injecting bubbles into the liquid sample is provided. The bubbles are injected by means of a 0.925-in (2.35 cm) diameter loop of vinyl plastic tubing of the type used for medical catheterization with an outside diameter of 0.07-in (0.18 cm) and a wall thickness of 0.016-in (0.04 cm) located at the bottom of the sample. This loop is perforated with two rows of holes in each row spaced 0.125-in (0.32 cm) apart. The holes are made through the wall of the tubing. Due to the elastic nature of the tubing, the holes contract almost when the needle is withdrawn, so the actual hole diameter is much smaller than 0.04-in (0.1 cm). The tubing is sealed at one end of the loop with epoxy cement and a length of the tubing from the other end of the loop is fed outside to the air supply through a hole in the steel tubing, which is sealed with epoxy cement. Air is supplied at a pressure of 0.3 to 1.0 atm (30 to 100 kPa) to obtain a flow rate of 2.5 ft 3/hr (0.12L/min). Where it is suspected that the sample may react with the steel tube, the inside of the steel tube is sprayed with a fluorocarbon resin coating.

c. The sample is loaded to the top of the steel tube. For liquid samples, adequate ullage should be allowed. Solid samples are loaded to the density attained by tapping the cylinder until further settling becomes imperceptible. The sample at 20·C ± 3·C is subjected to the shock wave generated by the detonation of a pentolite (50/50 PETN/TNT) pallet, 2-in (5.08 cm) in diameter and 2-in ((5.08 cm) thick having a density of 1.6 ± 0.0.5 g/cc. The pentolite pallet is butted against the bottom of the test sample and initiated with a No. 8 strength detonator. The detonator is held in place by a cork detonator holder.

d. The criteria for propagation are:

(1) A stable propagation velocity greater than 4,900 ft/sec (1.5 km/sec) is observed.

(2) A hole is punched through the witness plate.

(3) The sample tubing is fragmented along its entire length.

The overall test results are considered positive if any two of the three criteria are met.

4. POSITIVE REACTIVITY TEST

Three trials of both the Deflagration/Detonation Transition Test and the Gap Test are performed on each sample. If any one or more of these trials provide positive results, the sample is determined to be reactive based on the Bureau of Mines procedures.

For multiple batches of like material thermally treated

Any residual ash remaining after burning operations shall be removed from the burning tray and placed in a 55-gallon drum to await sampling and analysis. The color of the ash usually ranges from white to black. In terms of texture, the ash residues appear in a variety of forms from light flakes to solid char and often will be seen in a crumbly granular "cake." Metal parts may also be found in the residual ash.

A Thief Sampler shall be used to sample containers of ash. The procedures for the successful operation of the Thief Sampler and proper sample collection are described below.

1. Choose the stainless steel or brass Thief Sampler for the sampling of the residual ash.

2. Make sure that the sampler is working properly by rotating the end of the device and ensuring that all moving parts are free moving and operational.

3. Ensure that the sampler has been thoroughly cleaned and decontaminated.

4. Wear all applicable and appropriate protective clothing and observe required sampling precautions.

5. Ensure that Thief Sampler is in the closed position before any sampling is performed.

6. Slowly lower the Thief Sampler into the barrel of waste ash until it reaches the bottom of the barrel.

7. Slowly rotate the top of the handle in a clock-wise fashion to open the Thief Sampler. The sampler should be slightly shaken to allow the ash to fall into the sampler.

8. Close the Thief Sampler by rotating the top of the handle in a counter clock-wise fashion to secure the sample.

9. Slowly retrieve the Thief Sampler from the barrel with one hand while wiping the sampler with a disposable cloth or rag with the other hand.

10. Carefully discharge all of the sample into a suitable sample container by slowly opening the sampler. This is done again by rotating the upper handle in a clock-wise fashion.

11. Cap the sample container; attach and seal; record in field log book; and complete the sample analysis request sheet.

12. Disassemble the sampler, if appropriate, and perform decontamination operations with an appropriate cleaning solution, or store the contaminated parts in a plastic tube for subsequent

cleaning. Store used rags in a plastic bag for subsequent treatment.

13. Only all-cargo aircraft, trucks, UPS, or other approved non-passenger vehicles will be used to ship hazardous waste samples to laboratories. EPA procedures (SW-846) for sample preservation must be followed and EPA and DOT regulations for transportation of hazardous materials/wastes must be met. Laboratories must certify that their procedures are EPA-approved and, in that certification, reference either 40 CFR 261 or Test Methods Manual SW-846.

The Bureau of Mines test protocol for reactivity includes the "Gap Test" and the "Deflagration/Detonation Transition Test." These two tests, to be performed in three replicas for reproducibility, call for a total volume of approximately two gallons of residue. All samples taken from the drums will be mixed to form one composite sample.

II.C. PROCEDURES TO PREVENT HAZARDS

II.C1. SECURITY PROCEDURES AND EQUIPMENT: 264.14, 270.14(b)(4); R315-8-2.5

The main entrance to Dugway is located one mile east of English Village at the eastern boundary of the facility. This entrance is manned by one or more guards 24 hours a day. Visitors and contractors may enter only at this gate and are required to obtain temporary vehicle passes from the Security Office located in Building 5438. Employees have permanent vehicle passes, government employee cards (specific to DPG), and security badges.

A fence follows most of the DPG property boundary that is not located on the Great Salt Lake Desert. It is extremely difficult to gain access to DPG by crossing the facility boundary where the fence does not extend because this would require crossing miles of barren, uninhabited desert. The remoteness and terrain of DPG make this a particularly unlikely possibility. Continuous surveillance of DPG is provided by roving security patrols. Three 8-hour shifts are maintained. Each patrol is motorized and radio-equipped and is assigned to a specific patrol area. In addition to specific patrol areas, the entire peripheral area of DPG is checked regularly by patrols.

There are no physical barriers around the OB/OD Area to prevent access to the unit. Access to DPG in general and the Carr facility and test ranges in particular is strictly controlled by security patrols. Only authorized personnel are allowed in the vicinity of the OB/OD Area. A gate across Durand Road near the Carr Facility checkpoint is closed when the OB/OD Area or the White Sage Firing Range is in use. Access through the gate at Durand Road is visually monitored by security personnel at the Carr Facility. The only other access is through the Simpson Springs Gate located at the end of Durand Road where it reaches the fenced facility property boundary; this gate is locked 24 hours/day.

Warning signs are posted near all access gates to discourage unknowing or unauthorized entry. Perimeter warning signs indicate the DPG area is restricted, dangerous, and that unauthorized entry is illegal. The signs are posted even where fencing does not exist. At the entrance to the OB/OD Area (at the turn-off point at Durand Road), a warning sign indicates "Danger - Unauthorized Personnel Keep Out." Signs are legible from a distance of 25 feet.

II.C2. INSPECTION SCHEDULE: 264.15, 270.14(b)(5), 265.377(a)(3); R315-8-2.6

II.C2.1 Copy of Inspection Schedule: 270.14(b)(5), 264.15; R315-8-2.6

DPG has developed a written inspection schedule for inspecting monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that is important for preventing, detecting, or responding to environmental or human health hazards that may occur at the OB/OD Area. A copy of the OB/OD inspection schedule will be kept at the Environmental Protection Office. Completed inspection logs will be maintained at the Weapons Branch office at the Carr Facility, with copies sent to the Environmental Protection Office. The inspection records will be retained for a period of at least three years as required by the Utah Administrative Rules (R315-8-2.6). Inspection schedules and inspection logs for the OB/OD Area are provided as Exhibits II.C-1 through II.C-4.

This inspection plan covers only that equipment necessary for the operation of the OB/OD Area. The inspection schedules and inspection logs for the facility-wide fire fighting equipment, the Hazardous Material Response Van, and facility-wide security systems are covered in DPG's existing RCRA Permit for the Central Hazardous Waste Storage Facility (CHWSF).

EXHIBIT II.C-1
INSPECTION SCHEDULE AND PROCEDURES FOR OPEN BURNING

FREQUENCY	ITEM	TYPES OF PROBLEMS
Before Each Burn Event	Burn Pan Site	• Check that the area surrounding the burn pan is free of brush and other combustible items within a 200-foot radius.
Before Each Burn Event	Burn Pan	• Check under the burn pan for evidence of releases (such as ash or stains). • Check welds and seams for cracks that could cause releases. • Check to make sure cover is free of cracks and holes; opens freely. • Check inside the pan for and remove all debris including snow, ice, and water. (Water is to be containerized for proper subsequent characterization and disposal.) • Check fire bricks (if present) for cracks, chips, and wear. • Check that propellant is no more than 3" deep in pan. • Check that personnel are using proper PPE, including: safety goggles or face shield; hard toe safety shoes; flameproof coveralls; and gloves (leather or leather palmed).
After Each Event and Weekly Between OB/OD Treatment Events	Waste Munitions Storage Magazines (2) and Satellite Accumulation Area Storage Magazine	• Check building integrity and evidence of any release of waste from containers. • Check that accumulation drums are closed and labelled. • Check to see that satellite accumulation volumes for each waste type (55 gallons) is not exceeded.
Before Each Detonation Event	Detonation Area	• Check that area is free of brush for ease of locating fragments and UXOs.

EXHIBIT II.C-1 (continued)
INSPECTION SCHEDULE AND PROCEDURES FOR OPEN BURNING

FREQUENCY	ITEM	TYPES OF PROBLEMS
Before Each Detonation Event	Detonation Pit	• Verify that pits (if used) are a minimum of 4 feet deep. • Check that sufficient soil cover (if used) is available to muffle noise and limit fragment dispersal. • Check that personnel are using proper PPE, including: safety goggles or face shield; hard toe safety shoes; flameproof coveralls; and gloves (leather or leather palmed).
After Each Burn Event	Burn Pan Site	• Check for completeness of burn and police the area for ejected PEP.
After Each Burn Event	Burn Pan	• Collect ash residue, if present. • Check that cover closes easily. • Check that cover security latch (or strapping) is in place to prevent the wind from blowing off the cover. • Check burn pan and cover for excessive warping that may prevent effective use.
After Each Detonation Event	Detonation Area	• Police area for duds (UXO) and fragments.
Weekly Between Each Treatment Event	Entire OB/OD Area	• Check for completeness of burn and police the area for ejected PEP as per SOP. • Police area for duds (UXO) and fragments. • Collect ash residue, if present. • Check that pan cover closes easily. • Check that cover security latch (or strapping) is in place to prevent the wind from blowing off the cover on burn pan. • Check burn pan and cover for excessive warping that may prevent effective use.

EXHIBIT II.C-1 (continued)
INSPECTION SCHEDULE AND PROCEDURES FOR OPEN BURNING

FREQUENCY	ITEM	TYPES OF PROBLEMS
Quarterly	Office Documentation	• Check for presence of all pertinent SOPs and manuals. • Check that explosives transport vehicle inspection document is up to date. • Check that field personnel training records are up to date.
Quarterly	Groundwater Monitoring Wells	• Check integrity of groundwater monitoring wells (e.g., condition of well locks, well casings, well seals, well identification numbers).
Quarterly	Safety and Emergency Equipment	• Check the availability and condition of the following: - First aid kit; - Fire extinguishers; - Two-way radios; - Telephone.
Quarterly	Security Equipment	• Check condition and lock on gate at Durand Road near Carr Facility. • Check warning signs on access route to OB/OD Area.
Quarterly	OB/OD Area	• Assess the need to backfill and level craters caused by detonation.

EXHIBIT II.C-2
DAILY INSPECTION OF OB/OD AREA

DATE: ______________________
TIME: ______________________

SIGNATURE OF INSPECTOR: __________________________
SIGNATURE OF SUPERVISOR: __________________________

Note: This inspection is performed on each day that OB/OD operations are performed. Weapons Branch personnel are responsible for ensuring this form is completed.

ITEMS INSPECTED:	TYPES OF PROBLEMS TO LOOK FOR:	PROBLEMS FOUND:	NOTATIONS AND OBSERVATIONS:	REMEDIATION ACTION TAKEN & DATE:
Burn Pan and Surrounding Areas (before treatment operations).	Check that personnel are using proper PPE including: safety goggles or face shield; hard toe safety shoes; flameproof coveralls; and gloves (leather or leather palmed). Check that burn pan and surrounding areas are free of brush within a 200-foot radius. Check under burn pan for evidence of releases (e.g., ash or stains). Check welds/seams for cracks. Check to make sure cover is free of cracks, holes, and opens freely. Check inside pan and remove all debris and any snow, ice, and water. (Water to be collected for proper characterization and disposal.) Check fire bricks (if present) for cracks, chips, and wear. Check that propellant is no more than 3" deep in pan.			

EXHIBIT II.C-2 (continued)
DAILY INSPECTION OF OB/OD AREA

ITEMS INSPECTED:	TYPES OF PROBLEMS TO LOOK FOR:	PROBLEMS FOUND:	NOTATIONS AND OBSERVATIONS:	REMEDIATION ACTION TAKEN & DATE:
Burn Pan and Surrounding Areas (after treatment operations).	Check for completeness of burn and police area for ejected material. Collect ash residue, if present. Check that cover closes easily. Check that cover security latch (or strapping) is in place. Check burn pan and cover for excessive warping that may allow precipitation to enter pan.			
Open Detonation Area (before treatment operations).	Check that personnel are using proper PPE including: safety goggles or face shield; hard toe safety shoes; flameproof coveralls; and gloves (leather or leather palmed). Check that area is free of brush. Verify that pits (if used) are a minimum of 4 feet deep. Check that sufficient soil cover (if used) is available to muffle noise and limit fragment dispersal.			
Open Detonation Area (after treatment operations).	Police area for duds (UXO) and fragments.			

EXHIBIT II.C-3
WEEKLY INSPECTION OF OB/OD AREA

DATE: ____________________
TIME: ____________________

SIGNATURE OF INSPECTOR: ________________________
SIGNATURE OF SUPERVISOR: ________________________

Note: This inspection is performed on a weekly basis between treatment events. Weapons Branch personnel are responsible for completing this form.

ITEMS INSPECTED:	TYPES OF PROBLEMS TO LOOK FOR:	PROBLEMS FOUND:	NOTATIONS AND OBSERVATIONS:	REMEDIATION ACTION TAKEN & DATE:
Burn Pan and Surrounding Area	Check for completeness of burn and police area for ejected material. Collect ash residue. Check that pan cover is in place. Check that cover security latch (or strapping) is in place. Check burn pan and cover for excessive warping that may allow precipitation to enter pan.			
Open Detonation Area	Police area for duds (UXO) and fragments.			
Waste Munitions Storage Magazines (2) and Satellite Accumulation Area Storage Magazine	Check building integrity and evidence of any release of waste from containers. Check that accumulation drums are closed and labelled. Check to see that satellite accumulation volumes for each waste type (55 gallons) is not exceeded.			

EXHIBIT II.C-4
QUARTERLY INSPECTION OF OB/OD AREA

DATE: ____________________
TIME: ____________________

SIGNATURE OF INSPECTOR: ____________________
SIGNATURE OF SUPERVISOR: ____________________

Note: This inspection is performed on a quarterly basis. Weapons Branch personnel are responsible for completing this form.

ITEMS INSPECTED:	TYPES OF PROBLEMS TO LOOK FOR:	PROBLEMS FOUND:	NOTATIONS AND OBSERVATIONS:	REMEDIATION ACTION TAKEN & DATE:
Office Documentation	Check for presence of all pertinent SOPs and manuals. Check that explosives transport vehicle inspection document is up to date. Check that field personnel training records are up to date.			
Groundwater Monitoring Wells	Check integrity of groundwater monitoring wells (e.g., condition of well locks, well casings, well seals, well identification numbers).			
Security Devices	Check condition and lock on gate at Durand Road near Carr Facility. Check warning signs on access route to OB/OD Area.			
Safety and Emergency Equipment	Check the availability and condition of the following: - First aid kit; - Fire extinguishers; - Two-way radios; - Telephone.			
OB/OD Area	Assess the need to backfill and level craters caused by detonation.			

Operating/Structural Equipment: The condition of the following OB/OD operating equipment will be inspected.

- Burn pans and surrounding area (OB);
- Detonation areas and surrounding perimeter to ensure areas are cleared of brush (OD);
- OB/OD Area groundwater monitoring wells; and
- Portable magazine storage sheds (used for ash and scrap metal accumulation).

Safety/Emergency Equipment: The availability and condition of the following equipment will be inspected.

- First aid kit;
- Fire extinguishers;
- Two-way radios; and
- Telephone.

Personnel Protective Equipment: The availability and condition of the following personal protective gear will be inspected.

- Safety goggles or face shield;
- Hard toe safety shoes;
- Flameproof coveralls; and
- Gloves (leather or leather palmed).

Security Devices: The condition of the following security equipment will be inspected:

- Security gate at Durand Road near the Carr Facility; and
- Warning sign at turn off from Durand Road to the OB/OD Area.

II.C2.2 **Types of Problems to be Checked**: 264.15(b)(3); R315-8-2.6

The types of problems which are looked for during the inspection are listed on the inspection schedule provided as Exhibit II.C-1.

II.C2.3 **Frequency of Inspection**: 264.15(b)(4); R315-8-2.6

The frequency of inspection of each item is listed on the inspection schedule provided as Exhibit II.C-1. The inspection frequency is based on the rate of possible deterioration of the equipment and the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected between inspections.

Inspections will be conducted by the either the Weapons Branch or the Escort and Disposal Detachment (depending on which group is actively performing OB/OD treatment). The inspections will be performed both before and after each OB/OD operation. Environmental problems that may potentially be encountered at the OB/OD Area are duds or unburnt explosives. These problems, if found during the inspections, are corrected on the spot in accordance with SOPs.

The Weapons Branch will also inspect the OB/OD Area: (1) weekly during downtime; and (2) quarterly to assess the condition of security, emergency, and safety equipment and the completeness of office documentation.

II.C2.4 <u>**Inspection Recordkeeping**</u>: 264.15(d); R315-8-2.6

Samples of the inspection schedule and procedures, daily (each use) inspection log, weekly inspection log, and quarterly inspection log for the OB/OD Area are included as Exhibits II.C-1 through II.C-4, respectively. The date and time of inspection, the name of the inspector, observations made, and the nature of repairs or remedial actions performed are recorded on the inspection sheet.

Inspection logs shall be maintained for a minimum of 3 years by the Weapons Branch, with copies sent to the Environmental Protection Office.

II.C2.5 <u>**Schedule of Remedial Action**</u>: 264.15(d); R315-8-2.6

Repairs or replacement of any deteriorated or malfunctioning equipment will be initiated immediately or as soon as is practicable to ensure that the problem does not threaten human health or the environment. Where a hazard is imminent or has already occurred, remedial action will be taken immediately. Environmental problems that may potentially be encountered at the OB/OD Area are duds or unburnt explosives. These problems, if found during the inspections, are corrected on the spot in accordance with SOPs. If any vital equipment is inoperative, deteriorated, or not in compliance with specific conditions, maintenance is initiated or the equipment is replaced before operations commence.

Space is left on the inspection logs to note problems observed and remedial action taken.

II.C2.6 <u>**Daily Inspections for Leaks, Spills, and Fugitive Emissions, and all Emergency Shutdown Controls and Equipment**</u>: 265.377(a)(3); R315-7-23.4

Inspections will be conducted by either the Weapons Branch or the Escort and Disposal Detachment (depending on which group is performing OB/OD treatment). The inspections will be performed both before and after each operation. The Weapons Branch will also inspect the OB/OD Area weekly during downtime.

II.C3. **PREPAREDNESS AND PREVENTION REQUIREMENTS**: 270.14(b), 264.32(a) through 264.32(d); R315-8-3

II.C3.1 <u>**Description and Location of Internal Communications and Alarm System**</u>: 264.32(a); R315-8-3.3

DPG utilizes a combination of telephone communications, radio communications and alarm systems to provide immediate emergency instruction to facility personnel.

Telephones are located throughout the installation including English Village, Fries Park, and other built up areas. Additionally, there are 25 remote telephones located in non-built up portions of Dugway in protected boxes along roads, at test sites, and near seldom-used structures throughout the installation. In addition to telephone and radio communications, DPG has an alarm system capable of providing emergency instruction to facility personnel. There are established notification and evacuation procedures at English Village, Fries Park, Carr, Ditto, Avery, Baker, and Michael Army Airfield. Other signaling and alarm devices are utilized at DPG to provide immediate instruction to facility personnel in an emergency. These include vehicle horns, vocal alarms, vehicle-mounted loudspeakers, and sirens. A listing of sirens and their locations at DPG is addressed in the DPG's exiting RCRA Permit covering the CHWSF (Contingency Plan).

One telephone is located in the vicinity of the OB/OD Area, on Durand Road approximately 500 feet northwest of the turnoff to the treatment unit. This is the area where operations personnel typically retreat during the open burn treatment events. Personnel typically retreat farther (e.g., to the gate near the Carr facility) during open detonation events. A telephone is readily available at the Carr facility security checkpoint.

In addition to the telephone, OB/OD treatment personnel also have access to two-way radios. Active contact is maintained with Range Control during treatment operations to receive clearance for initiation of an open burn or open detonation event.

II.C3.2 <u>Device to Summon Emergency Assistance from Outside the Facility</u>: 264.32(b); R315-8-3.3

Both the telephone system and the radio network described in Section II.C3.1 above can be used by facility personnel to summon emergency response from local emergency response teams.

II.C3.3 <u>Access to Communication or Alarm Control</u>: 264.34; R315-8-3.5

All OB/OD Area personnel will have immediate access to either a telephone or a 2-way radio. Personnel working at the OB/OD Area and personnel working in remote areas will carry 2-way radios or will have immediate access to a radio-equipped vehicle.

II.C3.4 <u>Description of Fire Control, Spill, and Decontamination Equipment</u>: 264.32(c); R315-8-3.3

DPG has an extensive supply of emergency equipment available at the installation, including fire control equipment, spill control equipment, and decontamination equipment. Available facility-wide equipment, is briefly noted below:

- DPG has its own fire department - the Fire Prevention and Protection Division. This division is equipped with fire-fighting vehicles, fire hoses and fire extinguishers. In addition, fire extinguishers, automatic sprinkler systems, and fire alarms are provided throughout the installation. A list of this equipment is provided in Section II.E.

- The Base Operations Contractor maintains various types of spill control equipment and decontamination equipment. A list of this equipment is provided in Section II.E.

- DPG also maintains a Hazardous Material Response Van. The equipment contained in this van includes fire control, spill control, and decontamination equipment for use by specially trained personnel in response to emergencies. The van is kept at the fire division. The equipment in the van is designed for use in those incidents which involve large quantities of hazardous waste/hazardous materials or which are difficult to control with equipment immediately available. A list of the equipment maintained in the Hazardous Material Response Van is provided in Section II.E.

The potential for spills to occur in conjunction with OB/OD operations is minimal. Wastes brought to the treatment area are self-contained munitions or packaged PEP. Since all wastes are in solid form, wastes that are dropped may simply be picked up or scooped up and placed either in the burn pan for OB treatment or on the ground (or in a pit) for OD treatment.

OB/OD personnel are instructed not to attempt to fight uncontrolled, unanticipated fires involving waste PEP or fires resulting from OB/OD operations. If uncontrolled fires result, the supervisor at the OB/OD Area will summon the DPG Fire Department to the area.

Emergency response equipment transported to the OB/OD Area during treatment operations includes:

- First aid kit;
- Fire extinguishers (one per vehicle);
- Two-way radios;
- Plastic bags for containing ash residue following burning;
- Safety goggles or face shields;
- Hard toe safety shoes;
- Flameproof coveralls; and
- Gloves (leather or leather palm).

II.C3.5 **Documentation of Water Volume and Pressure**: 264.32(d); R315-8-3.3

Facility-wide, DPG is equipped with 680 fire extinguishers of various types, including water, carbon dioxide, and dry chemical types. In addition, there are 22 automatic sprinkler systems protecting 18 buildings. DPG also has seven fire-fighting vehicles, which are maintained at the English Village and Ditto fire stations, that are capable of responding to fire incidents at the OB/OD Area.

DPG has water at adequate volume and pressure to supply the fire-fighting equipment on the fire fighting vehicles. This water is stored in storage tanks at English Village, Fries Park, Baker, Carr Facility, Ditto Technical Center, and Avery Technical Center. The storage tanks range in size from 60,000 gallons at Baker Lab to 400,000 gallons at English Village.

Portable fire extinguishers are also transported to the OB/OD Area during treatment operations. OB/OD personnel, however, are instructed not to attempt to fight fires involving waste PEP or fires resulting from OB/OD operations. If fires result, the supervisor at the OB/OD Area will summon the DPG Fire Department to the area.

II.C3.6 **Testing and Maintenance Schedule and Procedures for the Above-Mentioned Equipment**: 264.33; R315-8-3.4

The inspection plan described in Section II.C2 of this application describes procedures to ensure that emergency response equipment is readily available for use.

II.C3.7 **Documentation of Adequate Aisle Space**: 264.35; R315-8-3.6

Access roads on DPG range in width from approximately 18 to 30 feet wide. Primary roads are asphaltic concrete and secondary roads within built-up areas are high- or low-grade bituminous type. Secondary roads within non-built up operations areas are low-grade bituminous type or gravel. These roads are of adequate width and surfacing to allow the unobstructed movement of personnel, fire protection equipment, or spill control equipment to any area of facility operation in an emergency.

The OB/OD Area is located in an open, uninhabited portion of DPG that is free of obstructions and does not warrant the establishment of aisles. The OB/OD Area consists of an oval-shaped area approximately 1300 feet in width by 1800 feet in length, which has been cleared of vegetation. Burn pans are widely spaced at the treatment area allowing adequate room for unobstructed movement of personnel and equipment during routine operations or during emergencies. Aisle space with respect to OD treatment is unnecessary due to the nature of OD operations. All energetic materials undergoing OD treatment are placed in an open area of the OB/OD Area away from any structures.

II.C3.8 <u>Documentation of Arrangements</u>: 264.37; R315-8-3.7

Due to its remote location and the nature of its mission, DPG has its own security force, medical response facilities, and fire department. Outside coordination agreements have been negotiated by DPG with local organizations for medical and fire-fighting assistance. The organizations are listed as follows:

- Tooele County (fire protection)
- Utah Valley Regional Medical Center
- Holy Cross Hospital
- LDS Hospital
- University Hospital
- Tooele Valley Regional Medical Center
- U.S. Army Health Clinic, Tooele Army Depot

Copies of these coordination agreements are included in Section II.E.

II.C4. **GENERAL HAZARD PREVENTION:** 270.14(b)(8); R315-3-5(b)(8)

II.C4.1 <u>Identification of Possible Loading and Unloading Hazards</u>: 270.14(b)(8)(i); R315-3-5(b)(8)(i)

Containers of waste explosives shall be unloaded at the OB/OD Area according to the type of treatment required and in accordance with all Standard Operating Procedures (SOPs). Explosive materials shall be unloaded by hand. Waste explosives shall be placed directly on the ground for open detonation operations or in the burning pan for open burning operations. Due to the inherent nature of treatment, there are no engineered unloading ramps, docks, or other unloading structures associated with the OB/OD Area.

Vehicles to be loaded for transport of items to OB/OD Areas have their brakes set, motors off, and the wheels locked. Once the vehicle is secured, only those personnel properly fitted in personal protective equipment, who are involved in the initiation of waste explosive treatment will begin waste unloading. For OB treatment, the cover of the burn pan will be removed, and the interior of each pan will be inspected for any structural defects as well as any residual ash or unburned propellant. (Note that any residuals will already have been removed within 24 hours following the previous burn event.) Waste will be off-loaded and placed in the burn pan (for OB treatment) or on the ground (for OD treatment). With the off-loading procedures complete, the vehicle(s) are moved to a safe distance. Initiation of treatment then follows procedures specified in SOPs.

II.C4.2 <u>Description of Mechanisms to Prevent Run-Off and Flooding</u>: 270.14(b)(8)(ii); R315-3-5(b)(8)(ii)

Open burning operations are conducted in a burn pan which acts to contain initiating materials and residual ash. In addition, open burning operations are not conducted under adverse weather conditions and the burn pan is kept covered when not in use. Residual ash is promptly collected the day following treatment for satellite accumulation storage in the portable storage sheds located at the entrance to the OB/OD Area. These operational procedures prevent precipitation run-on and also minimizes the potential for contaminated runoff or leachate to be generated and to migrate to the soil and/or groundwater.

Due to the inherent nature of treatment, open detonation operations are conducted on the ground without any form of engineered control devices which will prohibit run-on or contaminated runoff. The logic behind this operational parameter is that such devices would be destroyed under normal treatment operations and that fragments would create a safety hazard to treatment personnel. Following an OD treatment event, the detonation area is inspected for signs of untreated wastes and scrap metal or other debris. Untreated wastes (e.g., duds) are re-detonated. Scrap metal and any other debris is promptly collected and containerized for proper disposal.

II.C4.3 **Description of Mechanisms to Prevent Contamination of Water Supplies**: 270.14(b)(8)(iii); R315-3-5(b)(8)(iii)

Operations and environmental conditions described in Sections II.G and III.B of this application are protective of local water supplies in the DPG vicinity.

DPG obtains its water supplies from groundwater in the Skull Valley drainage basin aquifer and the Dugway Basin aquifer. Due to the impervious composition of the soil on DPG and the depth of the aquifers, it is highly unlikely that any release of hazardous waste would result in damage to the installation's potable water supplies.

II.C4.4 **Identification of Equipment Failure and Power Outage**: 270.14(b)(8)(iv); R315-3-5(b)(8)(iv)

Treatment operations are not conducted during actual or forecasted electrical storms, when power outages might occur.

Power outages are not expected to cause problems at the OB/OD Area, because operations at these units do not require electrical power. The detonation of items at the demolition ground is usually conducted with hand-cranked blasting machines or non-electrical methods. Open burning of items does not require any electrical devices.

II.C4.5 **Personnel Protection Procedures**: 270.14(b)(8)(v); R315-3-5(b)(8)(v)

The handling of waste explosives shall be conducted in a manner that requires minimal contact of personnel with the waste. All handling operations and requirements for protective clothing shall include but not be limited to fire retardant overalls, safety shoes, safety glasses, and gloves. A minimum of two operations personnel are required for OB/OD treatment operations. SOPs list the maximum number of personnel that may be present for a given OB/OD operation. In order to minimize the potential for injury due to accidents during treatment, the personnel limits are not exceeded at any time.

Prior to initiation of the burn or detonation event, personnel retreat a safe distance from the OB/OD Area. At a minimum, personnel retreat down Durand Road to the area near the emergency telephone.

II.C4.6 **Procedures to Minimize Releases to the Atmosphere**: 270.14(b)(8)(vi); R315-3-5(b)(8)(vi)

Strict procedures are in place at DPG to minimize releases to the atmosphere during operation of the OB/OD Area. A maximum total amount of 5,000 pounds gross weight (2.5 short tons per hour) of munitions housing, mechanisms, and PEP materials was set as the per hour range limit for each open detonation. A maximum of 1,000 pounds of PEP was set as the limit for open burning in each of the three burn pans.

Prior to commencing OB/OD treatment, meteorological information must be collected to determine if environmental conditions are appropriate for conducting treatment. Information collected and meteorological limitations include the following:

- Time of day (1/2 hour after sunrise until 1/2 hour before sunset);
- Probability of precipitation (must be ≤ 50 percent);
- Probability of thunderstorm (must be ≤ 50 percent);
- Probability of electrical storm (must be ≤ 50 percent);
- Wind speed (must be between 3 and 30 miles per hour);
- Wind direction;
- Cloud cover (must be ≤ 80 percent);
- Cloud Ceiling (must be ≥ 200 feet);
- Visibility (must be ≥ 1 mile); and
- Clearing index (must be ≥ 500).

II.C5. **PREVENTION OF ACCIDENTAL IGNITION OR REACTION OF WASTES:** 264.17, 270.14(b)(9); R315-3-5(b)(9), R315-8-2.8

II.C5.1 Description of Procedures to Prevent Accidental Ignition or Reaction of Wastes: 264.17(a), 264.17(b); R315-3-5(b)(9), R315-8-2.8

All hazardous wastes handled at the OB/OD Area shall be assumed to be reactive due to their inherent physical characteristics. As such, personnel must take appropriate measures to prevent reactions which:

- Generate extreme heat or pressure, fires or explosions, or violent reactions;
- Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
- Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion;
- Damage the structural integrity of the device or facility; and
- Through other like means threaten human health or the environment.

The means to accomplish the aforementioned criteria are provided through the establishment of safety guidelines implemented through the SOPs. The safety guidelines include, but are not limited to, the following:

- No smoking will be permitted at the OB/OD Area;
- Unauthorized ignition sources (e.g., lighters and matches) are prohibited at the OB/OD Area;
- Explosive material awaiting destruction is stored at a safe distance from explosives being destroyed, and the material is protected against accidental ignition or explosion from fragments, grass fires, burning embers, or detonating impulses originating in the material being destroyed;

- Spark-producing equipment and tools are prohibited from use near explosive materials unless specifically authorized;

- Incompatible materials shall not be treated or stored in the same locations;

- Each burn pan is grounded by driving a metal stake into the ground and then connecting it to the pan with a metal cable.

- Supervisors shall perform inspections of hand tools and mechanical devices to ensure that they have not become unsafe for use as designated either to the item or to the operator;

- Motor vehicles used to transport waste explosives ammunition, or other material to the destruction site shall meet the requirements of AMC-R-385-100, Chapter 22; and

- Thermal treatment operations shall not be conducted during electrical storms.

II.C5.2 <u>Documentation of Adequacy of Procedures</u>: 264.17(c); R315-8-2.8

At the present time, OB/OD is the safest and most effective option for treatment of waste PEP generated at DPG. Alternative methods of treatment are being developed for some PEP wastes but are not yet available. The Weapons Branch and the Escort and Disposal Detachment provide PEP disposal services at DPG in accordance with all OB/OD Standard Operating Procedures (SOPs), the AMCR 385-100 Safety Manual, and applicable Technical Manual 60-Series material specifying detailed disposal procedures for explosive materials.

II.D. CONTINGENCY PLAN

Dugway Proving Ground is located in Tooele County, Utah, as shown on Exhibit II.D-1. It lies 80 miles southwest of Salt Lake City and 39 miles southwest of Tooele. The installation is serviced by two hard surfaced roads and one improved gravel road, none of which passes through any part of the installation. Utah State Route 199 connects DPG via Johnson's Pass with Utah State Route 36 at a point near Rush Valley. County Road B-15 connects DPG via Skull Valley with US Interstate 80 at Timpie Junction. An improved gravel road connects DPG via Lookout Pass with Utah State Route 36 at a point near Vernon. The remaining major hard surfaced roads in the vicinity are Utah State Route 73 in Rush Valley and Alternate U.S. Route 50 south of Dugway.

DPG occupies approximately 840,911 acres. However, most of this land is used only for occasional tests or is not used at all. There are six built-up centers at DPG, including Avery Technical Center, Baker Laboratory, Carr Facility, Ditto Technical Center, English Village, and Fries Park. These activity areas are shown in Exhibit II.D-2.

Hazardous wastes at DPG are managed in the following RCRA regulated units: Container Storage Building (Building 6672) at the Central Hazardous Waste Storage Facility (CHWSF), F999 Container Storage Building at the CHWSF, Igloo G used to store unexploded munition rounds containing chemical agent that are found on the test ranges, and the Open Burning/Open Detonation (OB/OD) Area.

The primary purpose of DPG is to conduct research into and perform testing on chemical and biological defense systems and flame, incendiary, and smoke obscurant systems. As such, DPG generates large quantities of F999 decontamination solutions and solids. Other hazardous wastes generated in the course of DPG operations include spent solvents and laboratory chemicals.

II.D1. COPY OF THE CONTINGENCY PLAN: 270.14(b)(7); R315-3-5(b)(7)

This Contingency Plan has been designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or nonsudden release of hazardous waste/material or hazardous waste constituents to air, soil, groundwater, or surface water at Dugway Proving Ground. The provisions of the plan will be carried out immediately whenever there is a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste/material or hazardous waste constituents which could threaten human health or the environment.

The Contingency Plan for Dugway Proving Ground is included in the DPG Disaster Control Plan (DCP), which serves as the master plan for emergency response at the facility, and includes the Chemical Accident/Incident Response Assistance Plan (CAIRAP) and the Spill Prevention Control and Countermeasure Plan/Installation Spill Contingency Plan (SPCC/ISCP). The DCP specifies implementation, notification, and evacuation procedures to be followed in the event of a disaster that may involve levels of command outside the DPG (e.g., TECOM). The CAIRAP, which is implemented by the Chemical Surety Office, is an annex to the DCP and is implemented in the event of a spill or release of chemical agent. It details organizational responsibilities and control procedures to be utilized in response to a spill or release of chemical agent. The SPCC/ISCP is also an annex to the DCP. It will be implemented in the event of a spill, fire, or explosion involving hazardous waste or hazardous materials. It specifically addresses organization responsibilities, as well as control and clean up procedures, to be followed in response to release of hazardous waste/hazardous materials. The ISCP, which is Section II of the SPCC/ISCP, addresses cleanup of spills and leaks of oil and hazardous wastes. The three plans are related to one another as shown in the schematic below.

Exhibit II.D-1: Location of U.S. Army Dugway Proving Ground in Utah

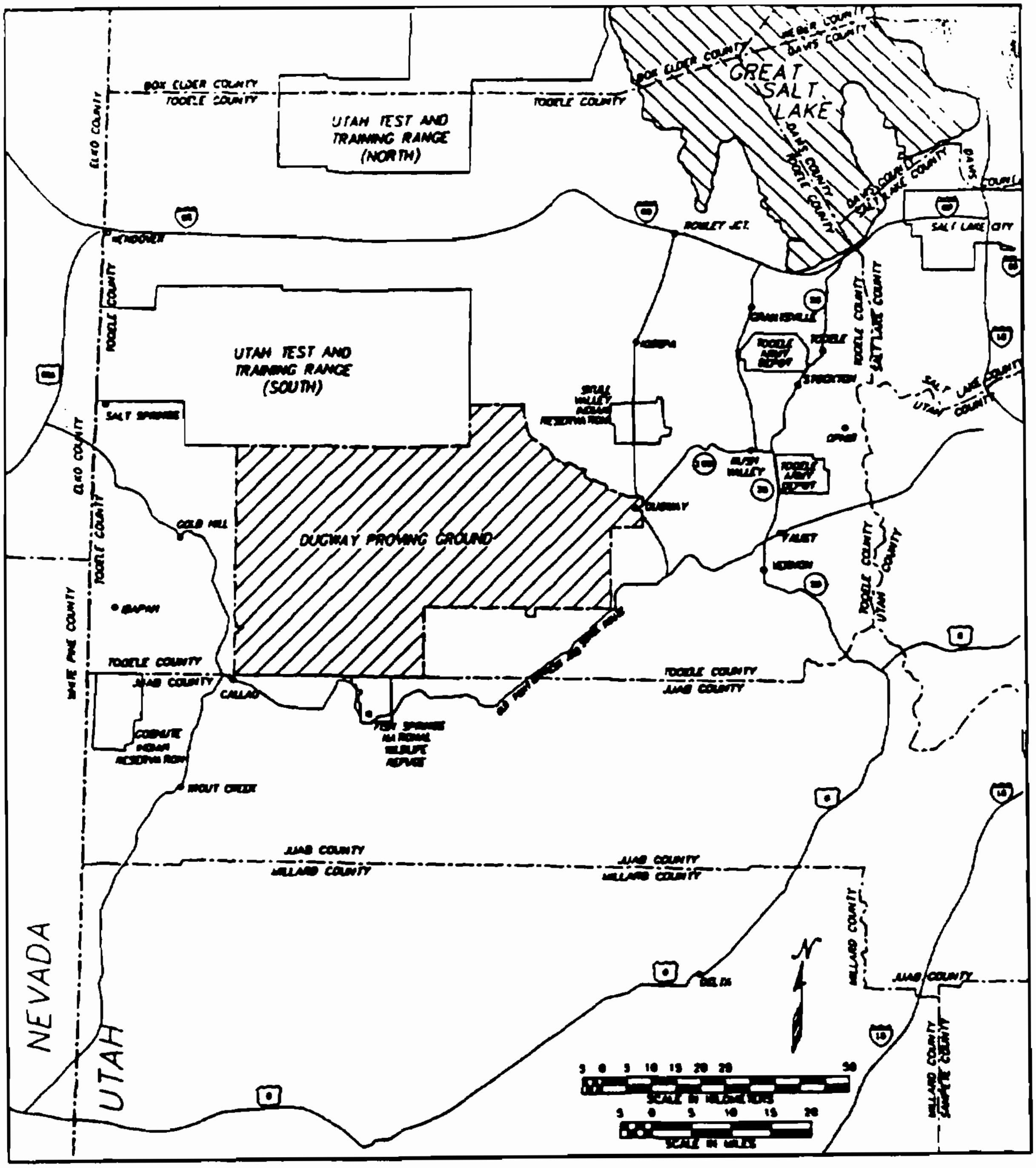
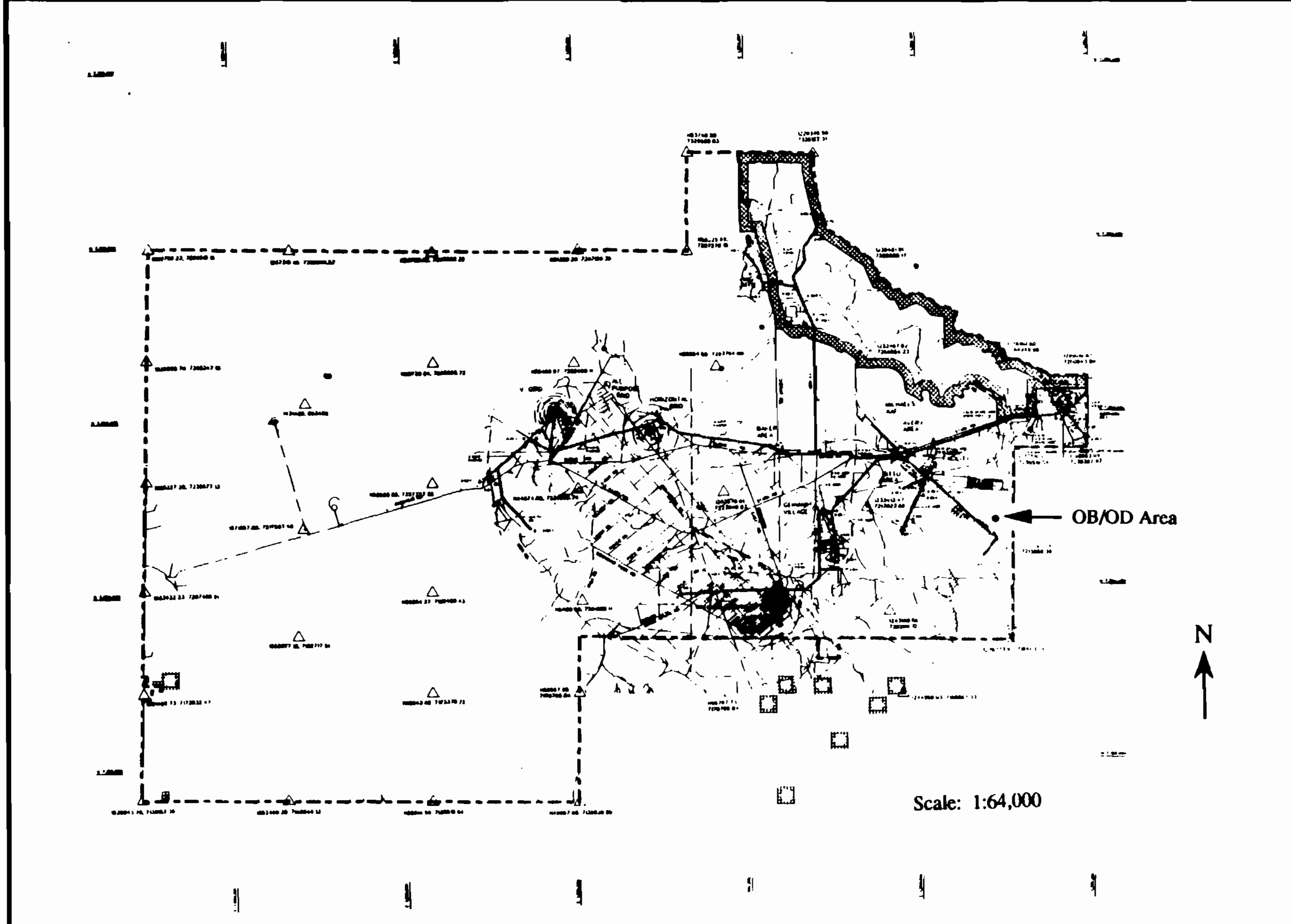


Exhibit II.D-2: Major Activity at Dugway Proving Ground



$$
\begin{tikzcd}
 & \text{DCP} \arrow[dl] \arrow[dr] & \\
\text{CAIRAP} \arrow[rr] & & \text{SPCC/ISCP}
\end{tikzcd}
$$

This Contingency Plan is primarily based on the SPCC/ISCP since it is specific to hazardous waste/materials accidents. Since no waste containing chemical agent will be managed at the OB/OD Area, implementation of the CAIRAP will not be necessary to respond to emergencies at the OB/OD Area. The CAIRAP, therefore, will not be considered further in this unit-specific OB/OD Contingency Plan. The DCP and the SPCC/ISCP were previously submitted to the State of Utah Division of Solid and Hazardous Waste as appendices to Section G of the Dugway Part B permit application for storage at the Central Hazardous Waste Storage Facility (CHWSF).

DPG maintains several emergency response teams to coordinate control and clean up in various types of emergency situations. Under the SPCC/ISCP, the Installation Response Team (IRT) responds to emergencies involving spills of hazardous waste/hazardous materials. The IRT is divided into the Primary IRT and the Secondary IRT. The Primary IRT is responsible for organization and supervision of spill response activities, while the Secondary IRT performs actual control and clean up of spills or releases.

Under the Disaster Control Plan, an Emergency Operations Center (EOC) is set up to direct all aspects of emergency operations in the event of a disaster. A Disaster Control Staff is also set up by the Disaster Control Officer (DCO) to provide supplies and logistics support at a disaster site. This staff includes representatives of the various emergency teams at DPG capable of providing assistance in an emergency. In addition, the DCP establishes an Installation Reserve Force (IRF) to support normal response elements (e.g., Fire Prevention and Protection Division) required during emergency situations. The IRF consists of personnel trained to provide support and back up to other emergency elements when the requirements of a situation exceed the capabilities of the latter. The IRF can also serve as an immediately deployable force for dealing with an emergency situation until relieved by specialized units. The IRF is described in greater detail in Annex V to the DCP.

II.D1.1 <u>Actions to Take in Case of an Emergency</u>: 264.52(a), 264.56; R315-8-4.3(a), R315-8-4-7

The Contingency Plan, particularly the SPCC/ISCP, will be implemented at the OB/OD Area when any of the following situations occur:

- Any fire or explosion which involves, or could spread to, hazardous waste storage satellite accumulation areas.
- Any uncontrolled or unusual fire or explosion in the OB/OD Area.
- Spills or material release accompanied by any of the following:
  - imminent danger of fire or explosion
  - release of toxic fumes
  - evidence of spreading toward surface water or ground water
  - release of material off-post
  - evidence of extensive leaching into soil

In the event of any of the above-mentioned situations, the person discovering the incident will call the Provost Marshal's Office (PMO) at 911. The PMO will then notify the Installation On-Scene Coordinator (IOSC) and the Installation Commander. The IOSC will request the following information:

- What is the type of incident? (fire, explosion, spill, or vapor release)
- Were personnel injured, disabled, or killed?
- What is the location of the incident?
- What is the source of the incident?
- What is the areal extent of the incident?
- How much material is involved?
- What type of material is involved?
- What is needed in terms of equipment and people to combat the emergency?

The IOSC will then determine whether to implement the SPCC/ISCP based on this information.

The responses and control procedures described in this section will be initiated in the event of an incident at DPG involving fire, explosion, spill, or vapor release of hazardous materials which poses a possible threat to human health and environment. These procedures will be conducted by personnel who have been trained in accordance with Section II.E, the Training Plan, to respond properly under the Contingency Plan. In all incidents, the initial response will be to protect personnel, limit movement of released material and, if practical, control the source.

- <u>Incidents Involving Fire or Explosion</u>

OB/OD personnel are instructed not to attempt to fight uncontrolled, unanticipated fires involving waste propellants, explosives, or pyrotechnics (PEP) or fires resulting from OB/OD operations. If an uncontrolled fire occurs, the supervisor at the OB/OD Area will summon the DPG Fire Department to the area.

The OB/OD Area can be easily reached by fire-fighting equipment and emergency vehicles based in English Village and Ditto. The Fire Prevention and Protection Division, under the direction of the Fire Chief, is responsible for control of fires and explosions. DPG's Fire Department is notified in advance of all OB/OD treatment events and placed on standby. In the case of unplanned explosions involving munitions, the Technical Escort Detachment is responsible for responding to the incident.

The following actions will be taken in the areas affected by a fire or explosion associated with hazardous waste management:

1. The discoverer of the fire/explosion will sound the alarm and call PMO.

2. PMO will immediately contact the IOSC (or alternate IOSC), the Emergency Operations Officer (EOO) or DCO, the Fire Chief, and the Installation Commander.

3. Work in all affected areas will be shut down immediately at the direction of the supervisor for the area.

4. The supervisor will clear all personnel not involved in controlling the fire/explosion from the area.

5. The supervisor will designate an employee to limit pedestrian and vehicle access to the area until the Security Division arrives to take over.

6. The supervisor will assure that possible sources of ignition are shut down.

7. The IOSC will take the following actions:

   a. Notify the Fire Prevention and Protection Division of the details of the incident.

   b. Confirm that operations in the area have been shut down.

   c. Give the evacuation signal if necessary.

   d. Notify local authorities if assistance is required.

   e. Notify the required government agencies.

8. The Fire Prevention and Protection Division will take the following actions:

   a. Wear protective clothing and respirators appropriate for the magnitude and type of fire or explosion and materials involved.

   b. Control the fire using appropriate methods and equipment.

      Fire fighting equipment is maintained by the fire department.

   c. Attempt to minimize run-off during fire control.

   d. Assign personnel to contain any resulting runoff.

9. The IOSC will determine when the emergency situation has passed and no longer presents a threat to human health or the environment.

10. The IOSC will designate support groups responsible for maintaining the security of the area and preventing a recurrence.

11. Fire prevention personnel, as well as personnel from the area where the incident occurred, will clean up the area and decontaminate all emergency and process equipment utilized or affected in the emergency.

12. Any waste or residue remaining will be properly containerized or otherwise collected and disposed of through the Defense Reutilization Marketing Officer (DRMO) or a contracted RCRA treatment, storage, and disposal facility (TSDF).

- <u>Spills or Releases</u>

The potential for spills to occur in conjunction with OB/OD operations is minimal. Wastes brought to the treatment area are self-contained munitions or packaged PEP. Since all wastes are in solid form, wastes that are dropped may simply be picked up or scooped up and placed either in the burn pan for OB treatment or on the ground (or in a pit) for OD treatment.

In the unlikely event that a major spill occurs at the OB/OD Area, the following actions will be taken in response to a spill release of hazardous materials/hazardous wastes. The Escort and Disposal Detachment and/or the Weapons Branch are responsible for control and clean-up of spills and releases of PEP.

1. The discoverer of the spill or release will immediately call PMO and will report the spill to the area supervisor.

2. PMO will notify the IOSC, the Fire Chief, and the Installation Commander.

3. All operations in the affected areas will be shut down immediately at the direction of the supervisor of the area.

4. The IOSC will take the following actions:

   a. Activate the Escort and Disposal Detachment and/or the Weapons Branch and inform them of the details of the spill/release.

   b. Assess the magnitude and extent of the spill/release.

   c. Notify local authorities and clean-up contractors if assistance is required.

   d. Notify the required government agencies.

5. The Escort and Disposal Detachment and/or the Weapons Branch will take the following actions:

   a. Utilize protective clothing, respirators, and equipment appropriate for the magnitude of the spill and the type of materials spilled. All respirators used will be NIOSH/OSHA-approved.

   b. Contain the spill in the smallest area possible.

   c. Collect spillage by placing it directly in approved containers.

   d. Remove contaminated soil with shovels or other appropriate equipment and place it into approved containers.

6. Containerized non-explosive waste will be stored at a 90-day storage area in the Carr Facility and, if determined to be hazardous waste, will be transferred to DPG's Central Hazardous Waste Storage Facility. Recovered explosive waste spilled at the OB/OD Area, will be treated by OB/OD in accordance with SOPs.

7. The IOSC will determine when the emergency situation has passed and no longer presents a threat to human health or the environment.

8. The IOSC will designate support groups responsible for maintaining the security of the area and preventing a recurrence.

9. The Escort and Disposal Detachment and/or Weapons Branch personnel will clean up the area and decontaminate all emergency or process equipment utilized or affected in the emergency.

II.D1.2 **Arrangements with Local Authorities**: 264.52(c); R315-8-4.3(b)

Due to its remote location and the nature of its mission, DPG has its own security force, medical response facilities, and fire department. Outside coordination agreements have been negotiated by DPG with local organizations for medical and fire-fighting assistance. The organizations are listed as follows:

- Tooele County (fire protection)
- Utah Valley Regional Medical Center
- Holy Cross Hospital
- LDS Hospital
- University Hospital
- Tooele Valley Regional Medical Center
- U.S. Army Health Clinic, Tooele Army Depot

Copies of these coordination agreements are included as an appendix to Section G of the Part B permit application for storage at the CHWSF.

II.D1.3 **Names, Addresses, and Phone Numbers of Emergency Coordinators**: 264.52(d), 264.55; R315-8-4.3(c), R315-8-4.6

The IOSC is the coordinator for the SPCC/ISCP. This position is filled by the Chief of the Fire Prevention and Protection Division. In the absence of the Fire Chief, the following personnel, in descending priority, will act as the IOSC:

1. Fire Chief/Senior Fire Officer

2. Director of Engineering, Housing and Logistics

A list of the emergency coordinators and their addresses and phone numbers is provided in Exhibit II.D-3.

The IOSC is responsible for activation of the Installation Response Team (IRT), assessment of hazards, and coordination of control and clean up activities. The IOSC and alternates are authorized by the Installation Commander to commit resources necessary to implement the Contingency Plan.

The Emergency Operations Officer (EOO) and the Disaster Control Officer (DCO), respectively, serve as the primary and alternate persons responsible for implementation of the DCP. The EOO or the DCO may be called to respond to a hazardous waste/material accident and have the authority to commit resources during an emergency operation. The names of these personnel are also listed in Exhibit II.D-3.

II.D1.4 **Location and Description of Emergency Equipment at the Facility**: 264.52(e); R315-8-4.3(d)

Due to the nature of materials handled at DPG as part of its supply and maintenance missions, DPG maintains a full complement of equipment suitable for emergency response. Exhibits II.D-4 lists fire protection equipment available at DPG. Exhibit II.D-5 lists spill response equipment maintained by the Secondary IRT at Building 5476. Exhibit II.D-6 lists the wide range of equipment kept in the Hazardous Materials Response Van which is kept at the Fire Department. This van serves as a supply point for more extensive emergency equipment than that maintained at the various buildings and hazardous waste management units. The equipment maintained in the van will be used for emergency response activities as well as less serious circumstances such as decontamination of equipment. Lists of emergency equipment will be reviewed annually and updated as required.

EXHIBIT II.D-3
EMERGENCY COORDINATORS

	Title/Name & Address	Home Phone	Office Phone	Contingency Plan	Position
1.	Chief, Fire Prevention & Protection Div. Jack Skinner 154 E. 4th Avenue Dugway, UT 84022	(801) 831-4542	(801) 831-2515	SPCC/ISCP	IOSC
2.	Assistant Fire Chief Pat Antry Terra, UT 84022	(801) 837-2362	(801) 831-2515	SPCC/ISCP	Alternate IOSC
3.	Director, Eng., Housing & Logistics David Thomas 372 West 2nd Avenue Dugway, UT 84022	(801) 831-4220	(801) 831-2161	SPCC/ISCP	Alternate IOSC
4.	Director, Plans and Operations Gale Chapin 503 Bexfield Drive Dugway, UT 84022	(801) 831-4137	(801) 831-3531	DCP	EOO
5.	Chemical Surety Officer Chris Dunn 397 East 400 North Tooele, UT 84074	(801) 882-3861	(801) 831-5385	CAIRAP	CAICO
6.	Chief, Environmental Program Office Ed Duplak Bldg. 5132, Room 170 Dugway, UT 84022	(801) 831-4946	(801) 831-3417	SPCC/ISCP	Environmental Oversight

EXHIBIT II.D-4
FIRE PROTECTION EQUIPMENT

Item	Description/Use	Location
7 firefighting vehicles	various sizes, equipped for brushfires, airfield crashes, structural fires	Ditto Technical Center, English Village
680 fire extinguishers	water, CO_2, Halon, dry chemical types	built-up areas of DPG
22 automatic sprinkler systems	activated in the event of fire	18 buildings at DPG
1 Halon system	fire protection	Bldg. 5450 Computer room
2 Halon systems	fire protection	Bldg. 5444 Communications
1 Halon system	fire protection	Bldg. 4258 Photo computer
1 Halon system	fire protection	Bldg. 4531 Computer
1 Halon system	fire protection	Bldg. 4156 Chem Lab
1 Halon system	fire protection	Bldg. 4153 Chem Lab
1 Halon system	fire protection	Bldg. 4132 Communications - Ditto
542 smoke detectors	signal if smoke is present	all housing units
fire alarms	manually activated in the event of fire	most occupied buildings at DPG
protective clothing (hard hats, rubber/chemically resistant suits, rubber gloves, SCBA or other respirators)	for use by firefighters	Fire Prevention and Protection Division

EXHIBIT II.D-5
SECONDARY IRT SPILL RESPONSE EQUIPMENT*

	Item	Description/Use
1.	Heavy Equipment:	
	Grader	Road Cab; grading spill sites
	Crane	Truck
	Crane	Crawler
	Tractor	Crawler
	Trailer	Water, Tank
	Truck	5-ton dump truck; removing contaminated soil
	Front End Loader	Removing contaminated soil
2.	Small Spills Equipment:	
	Spill Control pillows	Spill control
	Chemical absorbent material	Absorb spills
	Acid neutralizer	Neutralize spilled acids
	Caustic neutralizer	Neutralize spilled bases
	Drum plugs	Various sizes; plug drum holes or leaks
	Recovery drums	Overpack damaged containers, store contaminated soil
	Drum bung wrench	Tighten or loosen drum bungs
	Teflon thread sealant tape	Seal drums and containers; stop drum leaks
	Barricade tape and banners	Control access to spill area
	Chem/Kleen-ups	Clean up spills
	First-aid kit	Dress wounds, care for injuries
	Fire extinguisher	Dry chemical; put out fires
	Eye wash bottle	Clean eyes contaminated with spilled material
	Chemical clean up mops	Mop up spills

* All listed equipment is stored in the IRT Building, located on the outside of the northeast corner of Bldg. 5476.

EXHIBIT II.D-5 (Cont'd)
SECONDARY IRT SPILL RESPONSE EQUIPMENT*

Item	Description/Use
Broom	Sweep up spilled material
Floor squeegee/ bench squeegee	Mop spills, decontaminate floors
Mop bucket and wringer	Mop spills, decontaminate floors
Floor detergent	Decontaminate floors
Rubber dust pan	Collect dirt
Long-reach tongs	Grasp objects
Polyliners for waste bucket	Line buckets for containment of contaminated materials
Reusable waste bucket	Contain garbage
Paper towels	Dry surfaces
Flashlight	Look for cracks, leaks, spilled materials
3. Personal Protective Equipment	
Tyvex coveralls	Protect skin from hazardous materials/ hazardous wastes
Rubber gloves	Protect skin from hazardous materials/ hazardous wastes
Splash goggles	Protect eyes from hazardous materials/ hazardous wastes
Shoe covers	Protect feet from hazardous materials/ hazardous wastes
Neoprene gloves	Protect skin from hazardous materials/ hazardous wastes
Respirators with organic and acid gas cartridges	Avoid breathing harmful vapors or particles
4. Information:	
Emergency telephone numbers	Call for assistance, notify others
Instructions for equipment use	Proper use of equipment

* All listed equipment is stored in the IRT Building, located on the outside of the northeast corner of Bldg. 5476.

EXHIBIT II.D-6
HAZARDOUS MATERIAL RESPONSE VAN

ITEM	DESCRIPTION/USE
1. Tools and General Equipment:	
Band cutters	Various sizes; cut drum bands
Bolt cutters	Cut bolts or drums
Lead wool	Abrasive
Duct tape	Seal containers
Polypropylene rope	1/2-inch, 200 ft.
Rubber dust pan	Collect dust
Drum upender	Turn over drums
Pry bar	Pry open drums, other objects
Waste labels	Label contents of drums
Marking pen	Label contents of drums
Drum bungs and seals	Close and seal drums
Teflon thread sealant tape	Seal drums
Coal shovel	Shovel contaminated soil
Sledge hammer	Smash sealed doors, etc.
Lantern and flashlights	Non-sparking; provide light during power failure or during spill clean up
Drum plugs	Various sizes; plug drums
Gas leak putty	Plug leaks
Recovery drums	85-gal and 55-gal capacity; overpacking, containerizing waste
Chemical identification labels	Label containers
5-gal. plastic pail	Spill clean up, decontamination
Polyliners	Line pails and recovery drums
Barricade tape and banners	Limit access to a spill site

EXHIBIT II.D-6 (Cont'd)
HAZARDOUS MATERIAL RESPONSE VAN

	ITEM	DESCRIPTION/USE
2.	Non-Sparking Tool Box With Non-Sparking Tools	
	Screwdriver	12-inch straight
	Screwdriver	10-inch Phillips
	Hatchet	Break through doors, etc. in an emergency
	Bung wrenches	Tighten or loosen drum bungs
	Razor knife	Cut various material
	Bonding or grounding wire	With end clips
	Funnel	Plastic, 8-inch
	Safety shears	Cut various material
	Safety wire	Fasten and secure items
	Dead brow hammer	Hammer rails, smash through objects in an emergency
	Screwdrivers	Various sizes
	Vice grips	Various sizes
	Cold chisel	Chiseling
	Claw hammer	
	Pipe wrench	14-inch
	2-way radios	Communication
3.	Absorbents and Neutralizers	
	Sand	Absorb spilled material
	Sodium bicarbonate	Neutralize spilled material
	Vermiculite	A low density absorbent
	Speedi-dry	Absorb spilled material
	Spill pillows	Permeable bags containing looseabsorbent

EXHIBIT II.D-6 (Cont'd)
HAZARDOUS MATERIALS RESPONSE VAN

	ITEM	DESCRIPTION/USE
3.	Absorbents and Neutralizers (cont'd)	
	"Safe-Step" absorbent	A clay absorbent
	Acid neutralizer kit	Neutralize spilled acids
	Caustic neutralizer kit	Neutralize spilled caustics
	5% acetic acid	Neutralize spills
	Mercury spill kit	Control Mercury spills
	Radioactive kit	Control radioactive spills
	White absorbent cloth	Absorb spilled material
4.	Decontamination Supplies	
	Buckets Non-sparking, 2 1/2 gal	Hold decon solution
	Chemical absorbing mops	Mop up spilled chemicals
	Hazardous material	Contain spilled materials plastic trash bags
	Bench Squeegee	Decontaminate surfaces
	Broom	Sweep up waste
	Concentrated cleaning solution	Clean surfaces and contaminated items
	Floor squeegee	Decontaminate surfaces
5.	First Aid Equipment	
	Emergency eye washes	Rinse eyes contaminated with waste
	First aid kit	Care for wounds
	Emergency first aid guidebook	Instructions on care for wounds
	Emergency ring cutter	Cut rings
	Hot and cold packs	Apply heat or cold to injuries
	Burn relief spray	Relieve burns

EXHIBIT II.D-6 (Cont'd)
HAZARDOUS MATERIALS RESPONSE VAN

ITEM	DESCRIPTION/USE
5. First Aid Equipment (cont'd)	
Acid and caustic neutralizers for skin contact	Neutralize skin which has contacted corrosives
Plastic body bags	Hold bodies
Water gel fire blankets	Protection from fire
Antidotes for sulfate poisons/pesticides	Vitamin K1, syrup of Ipecac, Atropine
Disposable emergency blankets	Protection and warmth for injured persons
6. Personal Protective Equipment	
Protective gloves	PVC, neoprene, nitrile, natural rubber
Hard hats	Protection from falling objects
Coveralls	PVA, Tyvex
Extra air tanks	for SCBAs
Face shields	Facial protection from chemicals
Full-face respirators (NIOSH/OSHA approved)	Prevent inhalation of toxic vapors and particles
Cartridges	Pesticide, organic vapor, radioactive dust, acid gas, PCB-asbestos, ammonia-chlorine
Respirator cleaning pads	Clean respirators
Anti-fog lens solution	Prevent goggles and respirator faces from fogging
SCBA with spare parts	Supplied air respirator
Chemical splash goggles	Protect eyes from chemicals

EXHIBIT II.D-6 (Cont'd)
HAZARDOUS MATERIALS RESPONSE VAN

ITEM	DESCRIPTION/USE
6. Personal Protective Equipment (cont'd)	
Rubber boots	Protection from spilled chemicals
Decon equipment for PPE	Decontaminate PPE
Polybags	Disposal of contaminated or unusable PPE and respirator cartridges
7. Sampling Equipment	
Combustible gas monitor	Measure combustible gas in confined spaces
Oxygen monitor	Measure oxygen concentration
Gas detector types and pump	Detect gases
pH tester and/or test paper	Measure pH of liquids
Energized circuit detector	Detects energized circuits
Batteries	Power monitoring equipment
Temperature indicator	Measures temperature
Leak detection solution for gas leaks	Detects gas leaks
Mercury detection powder	Detects presence of Mercury
Explosimeter	Measures explosive limit
Radiation detector	Detects radiation

II.D1.5 **Evacuation Plan for Facility Personnel:** 264.52(f); R315-8-4.3(e)

Due to the size of the installation, evacuations beyond the DPG boundary, in the event of any emergency, are not anticipated. Additionally, due to the remote location of the OB/OD Area, evacuation of large areas of DPG is highly unlikely. Evacuation of the a particular area and evacuation of the entire installation are described below.

- Evacuation of an Area

Should an incident occur during the transfer of energetic material items to the OB/OD Area, evacuation of buildings near the incident may be necessary. All facility personnel are instructed in evacuation signals, procedures, and routes. All evacuation routes direct personnel to travel east on Stark Road to leave Dugway.

Should an incident occur at the site of the OB/OD Area, treatment operations personnel will retreat to a safe distance (e.g., down Durand Road to the entrance gate at Durand Road near the Carr Facility) until the IOSC gives the all-clear signal. Exhibit II.D-7 provides an evacuation route map for OB/OD operations personnel.

Generalized evacuation procedures for a limited area are described below.

1. The senior employee present will make the decision to evacuate an area.

2. Upon direction to evacuate an area, the senior individual present will ensure notification of all individuals and compliance with any prescribed protective measures by any or all of the following methods:

   a. public address
   b. two-way radios
   c. alarms

3. Personnel without transportation will proceed immediately to designated assembly points. Those with vehicles will transport as many people as possible and will follow evacuation routes.

4. The senior individual will contact the Emergency Operations Center by phone or radio and will indicate the number of personnel requiring transportation.

5. Transportation will be provided for all personnel at the assembly points and they will be taken to a safe area. All personnel who are injured or may have been exposed to hazardous chemicals or chemical agents will be immediately taken to the Health Clinic.

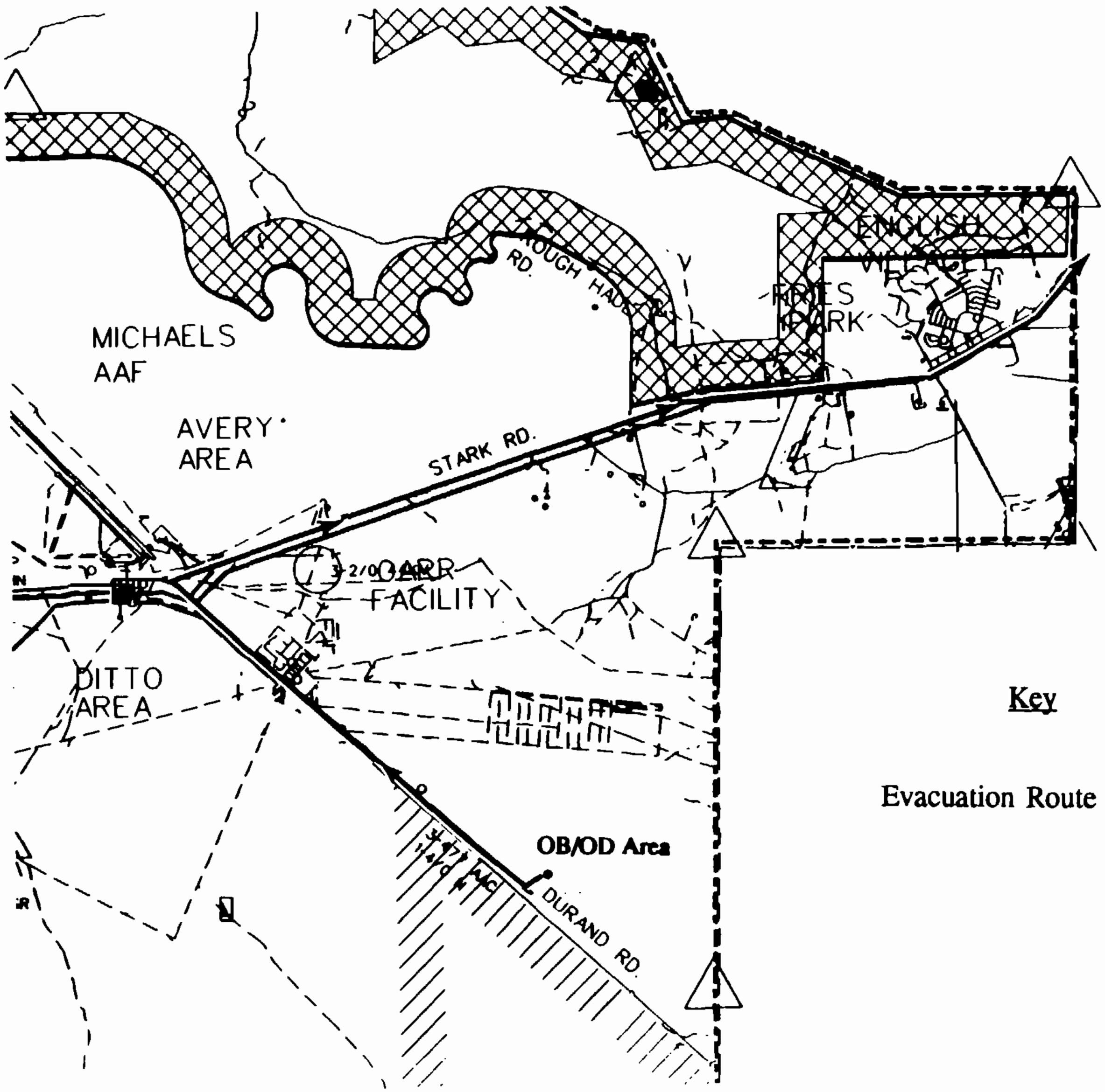
- Evacuation of the Installation

1. The first indication of a possible requirement to evacuate will be the sounding of a continuous blast (3-5 minutes) on the siren system.

2. Following the blast will be announcements which will provide details on the situation. If evacuation is necessary, the announcements will say so.

3. Personnel will immediately proceed to the nearest assembly point if they have no transportation. Those with transportation will proceed along the designated evacuation route.

Exhibit II.D-7: Evacuation Route from OB/OD Area



Key

Evacuation Route ⟶

4. Upon departure from DPG, the ultimate destination will be Tooele Army Depot.

5. A security force will remain at DPG to preclude entry of personnel until all precautions have been taken to insure that a threat to human health or the environment is no longer present. Re-entry of residents and the workforce will be permitted upon determination that no danger exists.

II.D1.6 **Location and Distribution of the Contingency Plan**: 270.14(b)(7), 264.53; R315-8-4.3, R315-3-5(b)(7)

Copies of the Contingency Plan have been given to the outside agencies listed in Exhibit II.D-8. In the event that the Contingency Plan is amended, the listed agencies will be sent copies of the amended plan and will be instructed to destroy outdated copies.

II.D2. **EMERGENCY PROCEDURES**: 264.56(a); R315-8-4.3(a), R315-8-4.7

II.D2.1 **Immediate Procedures for Emergency Coordinator to Alert All Facility Personnel and Notify State and Local Agencies**: 264.56(a); R315-8-4.7

When a hazardous waste/material emergency occurs, notification will proceed as follows:

- The discoverer of the incident will give the vocal alarm such as "fire, explosion," etc. or sound a vehicle horn.
- The discoverer will immediately report the finding to the Provost Marshall's Office (PMO) by telephoning 911 or radioing AAG 460 or AAG 470.
- The Provost Marshall (PM) will notify the Fire Chief and the IOSC. The PM will also notify the Installation Commander. The IOSC will be given the following information:

    1. Type of incident (fire, explosion, spill, or vapor release)
    2. Type of material involved in the incident
    3. Location and source of incident
    4. Areal extent of incident and estimated quantity
    5. Actions taken to mitigate the emergency and their effectiveness
    6. What is needed in terms of equipment and people to combat the emergency.

Until the IOSC arrives on the scene, the senior employee present will be responsible for the following actions:

1. Alerting potentially affected personnel
2. Evacuation of personnel from the unit
3. Attempts to contain the problem

Once the IOSC has been notified of the emergency, he will implement notification procedures and will activate the Primary and Secondary IRTs, if required.

EXHIBIT II.D-8
OUTSIDE AGENCIES RECEIVING COPIES OF CONTINGENCY PLAN

Environmental Protection Agency Region VIII, Denver, CO

Utah State Department of Health, Salt Lake City

U.S. Army Health Clinic, Tooele

Tooele Valley Regional Medical Center, Tooele

University Hospital, Salt Lake City

LDS Hospital, Salt Lake City

Holy Cross Hospital, Salt Lake City

Utah Valley Regional Medical Center, Provo

Tooele County Fire Department

Tooele County Sheriff's Office

Senior employees and all other personnel involved in spill/response management activities will receive training in spill response procedures to allow them to safely and effectively contain releases of hazardous wastes/hazardous materials.

When an incident occurs, the discoverer of the emergency will give a vocal alarm or will activate a fire alarm, siren, or vehicle horn to notify nearby personnel of any emergency situation presenting a threat to human health or the environment. The senior employee or IOSC, if present, will begin evacuation of personnel, if necessary.

Individuals visiting DPG will be escorted on site or informed of emergency notification procedures when they arrive on site. These individuals will receive notification of emergencies by the same means of facility personnel, i.e., sirens, alarms, horns, vocal instructions.

The IOSC or Installation Commander will notify the following agencies by telephone or radio if their help is needed:

- Tooele County Fire Department
- Utah Valley Regional Medical Center
- Holy Cross Hospital
- LDS Hospital
- University Hospital
- Tooele Valley Regional Medical Center
- U.S. Army Health Clinic, Tooele

A list of addresses and phone numbers for these agencies is provided as Exhibit II.D-9.

Local contractors will be notified by phone by the IOSC or DPG Commander if their assistance is needed for spill clean-up and control operations. The IOSC will also notify the following government agencies in an emergency:

1. Environmental Protection Agency
   One Denver Place
   999 18th Street, Suite 1300
   Denver, CO 80202-2413

24 hour answering service	(303) 293-1788
or	
National Response Center	(800) 424-8802

2. Utah State Department of Environmental Quality
   Division of Water Pollution Control
   288 North 1460 West
   Post Office Box 16690
   Salt Lake City, Utah 84116-0690

24-hour answering service	(801) 538-6333
0800 - 1700 hrs	(801) 538-6146
24-hour toll-free phone	(800) 572-6400

The information to be given to the agency contact is provided in Exhibits II.D-10 and II.D-11.

II.D2.2 <u>**Plans for Emergency Coordinator to Identify the Character, Source, Amount and Extent**</u>: 264.56(b); R315-8-4.7(b)

Whenever there is a release, fire, or explosion, the IOSC will identify the character, exact source, amount, and areal extent of any released materials. This will be based on knowledge of operations and activities at the particular

EXHIBIT II.D-9
LOCAL EMERGENCY RESPONSE AGENCIES

US Army Health Clinic Tooele, Utah 84074-5014	790-2572 Duty - Autovon 790-2304 After duty - Autovon (801) 833-2572 Duty Commercial (801) 833-2304 After Duty - Commercial
Tooele Valley Regional Medical Center 211 South 100 East Tooele, UT 84074	(801) 882-1697
University Hospital 50 North Medical Drive (1800 East) Salt Lake City, UT 84132	(801) 581-2121
LDS Hospital 8th Avenue and C Streets Salt Lake City, UT 84143	(801) 321-1100
Holy Cross Hospital 1045 East 100 South Salt Lake City, UT 84102	(801) 350-4111
Utah Valley Regional Medical Center 1034 North 500 West Provo, UT 84064	(801) 373-7850
Tooele County Fire Department	(801) 882-3636
Tooele County Sheriff's Department	(801) 882-5600

EXHIBIT II.D-10
INFORMATION REQUIRED FOR NOTIFICATION OF OUTSIDE LAW ENFORCEMENT AND FIRE AGENCIES

The following information will be given to the agencies listed in Exhibit II.D-9:

a. Name and location of installation.

b. Commander of installation and his telephone number.

c. Date and time of incident or time of discovery.

d. Severity of incident.

e. Location of incident and specific areas affected by incident.

f. Cause and source of incident.

g. Type and estimated amount of pollutant.

h. Samples taken (yes or no).

i. Damage impact on surroundings (fish, wildlife, and underground waters [e.g., draining water]).

j. Potential dangers (fire, explosion, toxic vapor, etc.).

k. Corrective action to eliminate pollution source.

l. Corrective action to remove pollutant.

m. Assistance required.

n. Estimated completion date of remedial actions.

o. Anticipated or actual reaction by news media and public to the incident.

EXHIBIT II.D-11
INFORMATION REQUIRED FOR NOTIFICATION OF OUTSIDE HOSPITALS

The following information will be given to the agencies listed in Exhibit II.D-9:

a. Name and location of installation.

b. Commander of installation and his telephone number.

c. Date and time of incident or time of discovery.

d. Severity of incident.

e. Location of incident and specific areas affected by incident.

f. Cause and source of incident.

g. Type and estimated amount of pollutant.

h. Samples taken (yes or no).

i. Assistance required.

area and characteristics of materials managed. Documentation identifying materials that may be involved in an emergency incident related to OB/OD treatment is readily available. Destruct orders, which cover waste and initiating explosives, are transported with these materials to the OB/OD Area for each treatment event. The material potentially involved in an incident, therefore, can be identified by referencing this documentation. If the IOSC or alternate IOSC is not immediately available at the scene of the incident, the responsibility for identifying of the character, exact source, amount and areal extent of the released materials may be delegated to an appropriate individual or individuals. These appropriate individuals include members of the Escort and Disposal Detachment, Weapons Branch, fire department personnel, and area supervisors.

II.D2.3 **Means for Assessment of Possible Hazards to Human Health or the Environment**: 264.56(c); R315-8-4.7(c)

The IOSC, and possibly the EOO, will assess possible hazards to human health and the environment that may result from the release, fire, or explosion. The assessment will consider both direct and indirect effects of the release, fire, or explosion. The assessment will be based on the following information:

- Types of materials involved in the incident
- Magnitude and extent of incident
- Effects of exposure to materials on humans and environment
- Effects of mixtures of affected materials

II.D2.4 **Procedures to be Followed by Emergency Coordinator in Case of Threat to Human Health or the Environment outside the Facility**: 264.56(d); R315-8-4.7(d)

If the IOSC determines that, based on the assessment, the incident could threaten human health or the environment outside the facility, he will notify EPA or the National Response Center. The IOSC will provide the agency with the information listed in Exhibits II.D-10 and II.D-11.

If the assessment indicates that it may be advisable to evacuate local areas outside of the facility, the IOSC will contact Tooele County officials.

II.D2.5 **Procedures to be Followed by Emergency Coordinator to Prevent Fires, Explosion, or Release from Occurring, Recurring, or Spreading**: 264.56(e); R315-8-4.7(e)

All operations near a hazardous waste spill, release, fire or uncontrolled explosion site will be suspended until cleared by the IOSC. Prior to restarting operations, process and structural equipment will be inspected for leaks, cracks, and other potential problems. Released waste will be properly collected and contained. Containers of non-explosive hazardous waste will be removed to 90-day storage areas prior to transfer to the Central Hazardous Waste Storage Facility. Any recovered explosive waste will be treated at the OB/OD Area in accordance with SOPs. The DPG Fire Department will also be present to monitor and control potential fires or explosions during containment and clean up operations.

A joint review of the cause of the spill will be conducted by the IOSC and appropriate division directors. The operation which caused the spill will not be restarted until adequate corrective and preventative measures have been developed and implemented. Any spill which necessitates implementation of this Contingency Plan will be followed by a joint report by the IOSC and the

Division Director to formalize their review of the incident and the follow-up actions required.

II.D2.6 **Storage, Treatment, and Disposal of Released Material**: 264.56(g); R315-8-4.7(g)

The IOSC will coordinate treatment, storage, and disposal of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.

Spilled materials will be containerized by placing spillage directly into containers for OB/OD treatment. Contaminated soil will be shoveled into containers. Damaged or leaky drums will be overpacked and returned to the area in which they were stored if no other hazards are associated with the drums (e.g., incompatible waste on the drum).

II.D2.7 **Monitor for Leaks, Pressure Buildup, Gas Generation, or Ruptures**: 263.56(f); R315-8-4.7(f)

Due to the nature of operations at the OB/OD Area, the unit does not involve equipment that would potentially leak, buildup pressure, generate gas, or rupture in the event of emergency shutdown. Therefore, there is no need for the IOSC to monitor for these items.

II.D2.8 **Procedures for Preventing Handling of Incompatible Wastes Until Cleanup is Complete**: 264.56(h)(1); R315-8-4.7(h)(1)

The IOSC will ensure that no waste that may be incompatible with the released material is stored in the area where the incident occurred until cleanup procedures are complete.

II.D2.9 **Decontamination Procedures**: 264.56(h)(2); R315-8-4.7(h)(2)

All operations near a hazardous waste spill, release, fire or uncontrolled explosion site will be suspended until cleared by the IOSC. Prior to restarting operations, process and structural equipment will be inspected for leaks, cracks, and other potential problems. Released waste will be properly collected and contained. Containers of non-explosive hazardous waste will be removed to 90-day storage areas prior to transfer to the Central Hazardous Waste Storage Facility. Any recovered explosive waste will be treated at the OB/OD Area in accordance with SOPs.

All emergency equipment used in responding to a spill, fire, explosion, or release will be decontaminated and repaired prior to reuse or will be replaced. Decontamination procedures will be prescribed by the IOSC.

II.D2.10 **Notification to EPA and State and Local Authorities before Resuming Operations**: 264.56(i); R315-8-4.7(i)

Before operations are resumed in the affected areas of the installation, the IOSC will notify the EPA and the Utah State Department of Health that:

1. Clean up of the affected areas has been completed so that treatment, storage, or disposal operations may be resumed without risk of incompatible material coming in contact with spilled material.

2. All emergency equipment listed in Exhibits II.D-4 through II.D-6 is cleaned and fit for its intended use.

II.D2.11 **Procedures for Recordkeeping and Reporting to EPA:** 264.56(j); R315-8-4.7(j)

A follow-up report of any incident requiring Contingency Plan implementation will be prepared by the IOSC. This report will be submitted to the State of Utah Department of Health within 15 days of the incident and will include the following information:

1. Name, address, and telephone number of DPG.
2. Name, address, and telephone number of the Installation Commander
3. Name, address, and telephone number of the IOSC
4. Date, time, location, and type of incident
5. Name and quantity of materials involved
6. Extent of injuries, if any
7. An assessment of actual or potential hazards to human health or the environment, where this is applicable
8. Estimated quantity and disposition of recovered material that resulted from the incident
9. A description of intended actions to prevent a similar occurrence in the future.

A copy of this report will be maintained in the DPG operating record and in the operating record of the unit or building where the incident occurred. In addition, copies of this report will be provided to the Installation Commander and the persons responsible for the DCP.

The U.S. EPA (Region 8) may also request a written report on the incident within 60 days of the event. This report will be prepared by the IOSC and will contain the above information and the following additional details:

1. Date and year of initial facility operation
2. Maximum storage or handling capacity of the facility and normal daily workloads
3. Description of the facility, including maps, spill flow diagrams, and topographical maps
4. Complete copies of the SPCC/ISCP including amendments
5. The causes of the spill, including a failure analysis of the system or subsystem in which the failure occurred
6. The corrective actions and countermeasures taken, including an adequate description of equipment repairs or replacements
7. Additional preventative measures taken or contemplated to minimize the possibility of recurrence
8. Other information the Regional Administrator may require.

The Contingency Plan will be reviewed and amended in the event of any of the following:

- The RCRA Permit is revised;

- The plan fails in a test or actual emergency;
- Changes occur in the design, construction, operation, maintenance, or other areas of the facility in a way that increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency;
- The list of emergency coordinators changes;
- The list of emergency equipment changes; or
- Significant changes occur in the DPG organizational structure.

II.E. **PERSONNEL TRAINING:** 270.14(b)(12); R315-3-5(b)(12)

This training plan was developed and implemented to ensure that the facility is operated and maintained in a manner that protects human health and the environment both on and off the installation. The training described in this application covers only those personnel involved directly in OB/OD operations. Training of other general facility personnel who may be summoned to the area in an emergency (i.e., fire department, medics, spill cleanup, etc.) is covered in the DPG's existing RCRA Permit covering the Central Hazardous Waste Storage Facility (CHWSF).

This training program covers RCRA regulations and the Utah Administrative Rules (R315), personnel safety, descriptions of hazardous waste management operations and processes, and emergency procedures for all DPG employees involved in hazardous waste management. A variety of training techniques are utilized including classroom courses, demonstrations, drills, and on-the-job training. The training plan addresses both initial training and annual training reviews.

This training plan is maintained in the Environmental Protection Office (EPO) office. The EPO is responsible for reviews and updates of the training plan at least annually or whenever there is a change in regulations, waste types, process design or operation, hazardous waste management equipment or techniques, or contingency plan procedures.

II.E.1 <u>Outline of Both the Introductory and Continuing Training Programs</u>: 270.14(b)(12); R315-3-5(b)(12), R315-8-2.7

Dugway's hazardous waste management training program is broken into two areas:

- Initial training requirements that must be met within the first six months of employment or job assignment, and

- Continuing training.

<u>Initial Training</u>

The initial training is performed in accordance with RCRA health and safety training, as well as 29 CFR 1910.120 OSHA health and safety training for hazardous waste operations and emergency response. The initial OSHA training program is established to meet the needs of general site workers and controlled site workers. The initial training thoroughly covers the following:

- Names of personnel and alternates responsible for site safety and health;

- Safety, health and other hazards present on the site;

- Use of personal protective equipment;

- Work practices by which the employee can minimize risks from hazards;

- Safe use of engineering controls and equipment on the site;

- Medical surveillance requirements, including recognition of symptoms and signs which might indicate over-exposure to hazards; and

- The site safety and health plan.

[redacted]

General Site Workers

The general site worker training is required for those personnel who are engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards. The general site workers receive a minimum of 40 hours of classroom instruction and a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor.

Controlled Site Workers

Controlled site workers are only occasionally on-site for a specific limited task and are unlikely to be exposed over permissible exposure limits. The controlled site workers receive a minimum of 24 hours of classroom instruction and a minimum of one-day actual field experience under the direct supervision of a trained, experienced supervisor.

If an employee works at both controlled and uncontrolled sites, then the more stringent general site worker training is required.

Supervisors

All first-line supervisors of general and/or controlled site workers must attend at least eight additional hours of specialized supervisor/management training at the time of job assignment. The supervisor training covers such topics as the employer's health and safety program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

Annual Refresher Training

In addition, all general and controlled site workers and their supervisors must attend eight hours of refresher training annually. The refresher training reviews the 40- and 24-hour OSHA training courses, including any critique of incidents that have occurred in the past year that can serve as training examples of related work, and other relevant topics.

Equivalent Training

Equivalent training is acceptable if there is documentation or certification that an employee's work experience and/or training has resulted in training equivalent to the 40-hour or 24-hour OSHA courses.

Continuing Training

Continuing training includes all training beyond the initial training discussed above and is not required within the first six months of employment nor is it required for any particular job assignment. This continuing training may include:

- Army Logistics Management College (ALMC) Hazardous Waste Handling Course (40 hours);
- Regulatory Compliance Training;
- Hazard Communications Training, in accordance with 29 CFR 1910.1200; and
- Any other applicable and appropriate hazardous waste management training.

Training course descriptions are provided in Appendix II.E-1.

II.E.2 **A Description of How Training Will be Designed to Meet Actual Job Tasks:** 264.16(a),(b),(c); R315-3-5(b)(12), R315-8-2.7

Exhibit II.E-1 describes those groups that are involved in operations at the OB/OD Area, including group name, job title(s) associated with each group, and job duties.

The Civilian Personnel Office (CPO) is responsible for maintaining accurate job descriptions for personnel from the Weapons Branch. The Escort and Disposal Detachment office maintains job descriptions for all personnel involved in operations at the OB/OD Area.

The training program has been designed to tailor course requirements to the subject areas and levels of detail appropriate for each position within the organization. The RCRA training most relevant for each position is presented in the Training Matrix, Exhibit II.E-2.

II.E.3 **Training for Emergency Response**: 264.16(a)(3); R315-3-5(b)(12), R315-8-2.7

DPG personnel involved in hazardous waste management are trained in emergency procedures, use of emergency equipment, and procedures of the Contingency Plan as part of classroom training, drills, and on-the-job training. Those groups which are responsible for planning, organizing, and implementing emergency response activities, receive advanced training in emergency response procedures. Outlines of the training required for members of these emergency response teams are provided in Appendix H-1 of DPG's existing RCRA Permit for the CHWSF. All other personnel receive basic emergency response training related to their particular duties. Personnel are trained in each of the following areas:

- Procedures For Using, Inspecting, Repairing, and Replacing Facility Emergency and Monitoring Equipment

Personnel receive instruction in the use of all equipment applicable to their duties. Operating personnel are responsible for inspecting equipment at their respective units. They receive instruction in this area as part of both classroom and on-the-job training. Upon noticing the need for repair or replacement of equipment, personnel will document the status of the item as "not acceptable" and will either repair it if authorized to do so or fill out a work request form.

All operators receive instruction in the use of fire extinguisher, alarms, and other firefighting equipment.

- Key Parameters For Automatic Waste Feed Cut-Off Systems

Due to the nature of operations at the OB/OD Area, the unit does not require an automatic waste feed cut-off system.

- Communications or Alarm Systems

All DPG employees are instructed in the location and use of communications and alarm systems as part of the Emergency Response portion of training. Operating personnel receive additional site-specific instruction in the use of communications and alarms particular to their respective hazardous waste management units.

- Response to Fires

All DPG personnel receive basic instruction in fire prevention and response during Emergency Response training. Operating personnel receive additional site-specific instruction that is specific to their respective hazardous waste management units.

EXHIBIT II.E-1
HAZARDOUS WASTE MANAGEMENT TREATMENT OPERATORS
OPEN BURNING/OPEN DETONATION AREA

Group Name	Job Title	Job Duties
Weapons Branch	• Explosive Test Operator Leader • Explosive Test Operator • Artillery Tester Leader • Artillery Tester • Engineering Technician Supervisor	Conduct OB/OD for the demilitarization of waste PEP. Maintain logs of the destructed materials. Conduct inspection and maintenance of the OB/OD Area.
Escort and Disposal Detachment	• EOD Team Leader • EOD Specialist	Responsible for conducting OB/OD of waste munitions from training exercises not managed by the Weapons Branch. Provides DPG with a rapid-response chemical accident/incident control force, provides technical escort services for agent munitions as requested, and provides explosive ordnance disposal support.

EXHIBIT II.E-2
TRAINING MATRIX

Functional Group and Job Position	General Site Workers and Their Supervisors		Controlled Site Workers and Their Supervisors		8-Hour OSHA Supervisor Training	8-Hour OSHA Annual Refresher Training	U.S. Army Ammunition Demilitarization Training
	40-Hour OSHA Training	3-Day On-The-Job Training	24-Hour OSHA Training	1-Day On-The-Job Training			
Weapons Branch							
• First-Line Supervisor	●	●			●	●	●
• Staff	●	●				●	●
Escort and Disposal Detachment							
• First-Line Supervisor	●	●			●	●	●
• Staff	●	●				●	●

- Response to Ground Water Contamination Incidents

All personnel receive basic instructions on procedures to take in response to ground water contamination incidents, particularly for spill response. Emergency procedures are taught in Initial Health and Safety Training and on-the-job training of Dugway's training program.

- Shutdown of Operations

The primary responsibility for unit shutdown procedures lies with the managers of the hazardous waste management units. However, all personnel with waste facility operating responsibilities are instructed in the proper site-specific procedures regarding planned or unplanned shutdown of operations. This training is reviewed annually.

II.E.4 Maintenance of Training Records/Copy of Personnel Training Documents: 264.16(d), 264.16(e), 270.14(b)(12); R315-3-5(b)(12), R315-8-2.7

All personnel at DPG who are involved in the handling or management of hazardous wastes will receive the required training. New employees will successfully complete the initial training program within six months after the date of their employment or assignment to the facility, whichever is later. Personnel that transfer to positions requiring greater hazardous waste management or emergency response training will receive the necessary training within six months of reassignment. All employees must complete the training requirements before they are permitted to work in unsupervised positions.

In order to ensure training within 6 months of transfer or employment, the initial 24-hour OSHA health and safety training is presented at Dugway during the first and third quarters of each calendar year. Employees requiring the 40-hour OSHA training are sent off-site for instruction.

Records documenting that each individual has completed the required training are maintained for three years after an individual leaves Dugway or until closure of the facility. Individual job descriptions and training records are maintained by each division's first-line supervisor as part of the individual's employment history. In addition, the Civilian Personnel Office maintains official records of civilian attendees of required hazardous waste management courses, and the Escort and Disposal Detachment office maintains the appropriate training records for its personnel.

II.E.5 Training Content, Frequency, and Techniques: 264.16(c), 264.16(d)(3); R315-3-5(b)(12), R315-8-2.7

The training program instructs DPG personnel on the federal and state regulations pertaining to hazardous waste management, personal safety procedures and equipment, emergency procedures, and unit-specific operations. Personnel receive varying amounts and types of training depending on their job position at DPG.

The training program utilizes a variety of training techniques including classroom instruction, demonstrations, drills, and on-the-job training. Exhibit II.E-2 presents the classroom training that is required for each job position involving hazardous waste management. Course descriptions are provided in Appendix II.E-1.

Continuing training also consists of a combination of classroom instruction, drills, and on-the-job training. An 8-hour update of the OSHA Health and Safety Training is given annually to all employees involved with hazardous waste. Continuing training also includes Contingency Plan and evacuation drills and observation of job performance by the employee's supervisor.

II.E.6 **<u>Training Director is Properly Trained</u>**: 264.16(a)(2); R315-3-5(b)(12), R315-8-2.7

Dugway's hazardous waste management training program is directed by an environmental protection specialist in the Environmental Protection Office. The training director's phone number is (801) 831-3417. The training director determines training course content and schedules training. The director is also responsible for managing Dugway's health and safety training contractor, who performs most, if not all, of the classroom instruction conducted at Dugway.

The qualifications required for Dugway's hazardous waste training director include:

1. Initial OSHA training, 40 hours

2. OSHA supervisor training, 8 hours

3. ALMC waste handlers training, 40 hours

4. Training/teaching experience and/or certification.

The training director provides guidance and assistance to all on-site generators to ensure that appropriate training is provided to all workers managing hazardous waste.

APPENDIX II.E-1

TRAINING COURSE OUTLINES

[redacted]

INITIAL OSHA HEALTH AND SAFETY TRAINING (24 Hours and 40 Hours)

1. Basic Hazardous Waste Management

   a. Regulatory overview for hazardous materials handlers
      -- OSHA 29 CFR 1910.120
      -- Worker rights and responsibilities
      -- Introduction to RCRA and Utah Administrative Rules
   b. Definition of a hazardous waste
   c. Responsibilities of hazardous waste generator
   d. Responsibilities of hazardous waste transporters
   e. Responsibilities of hazardous waste treatment, storage, and disposal facilities
   f. Hazardous wastes at Dugway Proving Ground
   g. Explanation of Dugway's Part B permit application

2. Personal Safety

   a. OSHA health and safety training
   b. Basic industrial hygiene
   c. Introduction to toxicology
   d. Personal protective equipment
   e. Hazardous waste decontamination procedures
   f. Site safety plan

3. Hazardous Waste Management Processes

   a. Container storage, including accumulation areas, 90-day storage areas, and the Central Hazardous Waste Storage Facility
   b. Open burning/open detonation (OB/OD) area
   c. 90-day storage tanks at the Materiel Test Facility

4. Hazardous Waste Work Practices

   a. General rules of chemical safety
   b. Container labeling--the key to chemical safety
   c. Corrosive chemical safety
   d. Flammable chemical safety
   e. Reactive chemical safety
   f. Compressed gas safety
   g. Proper chemical storage
   h. Material safety data sheets
   i. Workplace safety checklists

5. Emergency Procedures and Contingency Plan

   a. Spill control procedures
   b. Evacuation procedures
   c. Location, use, inspection, and maintenance of emergency equipment
   d. Decontamination procedures for hazardous waste management equipment

OSHA SUPERVISOR TRAINING - 8 Hours

1. Supervisor's responsibility

   a. Site health and safety program
   b. Hazard communication
   c. How to evaluate risk

2. Supervisor's role during an emergency

   a. Dugway contingency plan
   b. Regulatory reporting

3. Supervisor's liability

   a. Environmental liability
   b. Health and safety liability

4. Regulatory trends

   a. Discussion of future environmental and occupational regulations

5. Implementing Training

   a. Training resources
   b. Recordkeeping
   c. Evaluating effectiveness

ANNUAL OSHA REFRESHER TRAINING - 8 Hours

1. Review of accidents and incidents

2. Regulatory review

   a. Status of Part B permit application
   b. Review of annual inspection performed by the Utah Bureau of Solid and Hazardous Waste

3. New regulations

   a. Environmental
   b. Occupational
   c. Other

4. Review of new chemicals or processes

5. Review of major chemical hazards

   a. Corrosive chemicals
   b. Flammable chemicals
   c. Toxic chemicals
   d. Reactive chemicals

6. Review of basic industrial hygiene and toxicology

7. Review of personal protective equipment

AMMUNITION DEMILITARIZATION
AMMO-C-5
Length: 2 Weeks, 3 Days

PURPOSE: This course provides training for ammunition personnel in the various methods, procedures, and techniques of performing ammunition demilitarization.

SCOPE: Course curriculum provides current technical procedures and safety requirements for demilitarization/disposal of ammunition and explosives. Demilitarization methods include open burning, open detonation, deactivation furnace, washout/steamout, explosive waste incineration, contaminated waste processing, and any new developments. Included will be actual set up and detonation of live explosives by each student. Environmental requirements and decontamination methods are also presented.

PREREQUISITES: First priority is for those individuals who are enrolled in the Ammunition Management Intern Program as defined in AR 690-950. Second priority is for those individuals requiring certification under the provisions of AMCR 350-4, TRADOC 350-30, and FORSCOM-R 350-10. Successful completion of the Special Technical Ammunition Course (AMMO-C-9) or the Technical Ammunition Course (AMMO-C-3) is required. Federal Hazard Communication training is a prerequisite for U.S. students.

SPECIAL INFORMATION: Student should bring safety shoes, safety glasses, boots and rain gear as study may encounter rainy, muddy, working conditions for one week of the course.

SECURITY CLEARANCE: None.

COURSE CONTENT

1 - ORIENTATION

2 - DEMOLITION MATERIALS

3 - APPROVED METHODS/OPERATIONAL SAFETY

4 - DEMILITARIZATION TECHNOLOGY

5 - ENVIRONMENTAL REQUIREMENTS

6 - CERTIFICATION OF DISPOSAL OPERATIONS

7 - REVIEW OF RANGE SOP

8 - DEMOLITION RANGE EXERCISE

ALMC HAZARDOUS MATERIALS/WASTE HANDLING COURSE

1. The hazardous materials/waste problem
2. Hazardous materials/waste in the defense logistics system
3. Hazardous materials/waste laws, regulation, and policies
4. Hazardous materials classification
5. Health and environmental effects
6. Hazardous materials identification and labeling
7. Hazardous waste minimization
8. Hazardous materials packaging, handling, and transportation
9. Hazardous material storage
10. Installation/DRMO interface
11. Contingency planning and spill response

REGULATORY COMPLIANCE TRAINING

Regulatory compliance training is provided through short courses taught by private firms. In general, the objectives of this training are:

1. To provide an update on the most significant elements of RCRA and CERCLA;

2. To focus on new legislative, regulatory, and policy initiatives to allow more effective planning and budgeting of Dugway's hazardous waste management program; and

3. To provide an understanding of hazardous waste liability issues and the procedures that can be taken to avoid liability and minimize costs.

HAZARD COMMUNICATION TRAINING

1. OSHA's Hazard Communication Standard
2. Physical Forms and Exposure Hazard
3. Types of Physical and Health Hazards
4. Controlling Chemical Hazards
5. Introduction to Material Safety Data Sheets (MSDSs) and Physical Hazard Information
6. MSDS Health Hazard Information
7. Using Labels and the Hazardous Chemical Inventory

II.F. CLOSURE AND POST-CLOSURE PLAN

II.F1 CLOSURE PLAN DOCUMENTATION

II.F1.1 Description of Final Closure Procedures: 264.112(b)(1), 264.112(b)(2); R315-8-7

In keeping with the Army's preference for clean closure, upon cessation of activities at the OB/OD Area all OB/OD facilities, i.e., the burn pans, will be decontaminated and removed from the Area, and all contaminated ash residue and soils will be removed (to levels indicated by risk-based standards and criteria) from the OB/OD Area. These standards, which are based upon U.S. Environmental Protection Agency reference doses and/or health advisories, are presented in Exhibit II.F-1 and discussed in detail in Section II.F.1.7 below. The parameters identified in Exhibit II.F-1 represent those contaminants which could potentially result from OB/OD activities (refer to Sections II.A.3, II.B., and III.A.). As all contaminated ash and soils would be removed under this plan, there would be no further need for maintenance other than re-contouring the surface and covering the Area with soil and native vegetation.

Upon cessation of OB/OD Area activities, a sampling program will be conducted to determine if and, as appropriate, where residual ash and soils contain hazardous waste or hazardous constituents equal to or in excess of the standards identified in Exhibit II.F-1. The investigatory and characterization activities (as presented in the August 1993 Soil and Groundwater Investigation Report) conducted in preparing this permit application indicate that low levels of explosive residues were found in surface soils near two burn pans, that elevated lead levels were found in surface soils near one of the two pans noted previously, and that relatively low levels of non-target semivolatile compounds were found in soils samples from two borings. All other soil and groundwater data indicate that there was no impact from OB/OD operations. Therefore, this Closure Plan focuses on the clean closure of soils, not soils and groundwater. Refer to Sections II.G. and III.B. for additional details. This data indicates that the Army should be able to attain clean closure of this unit upon cessation of operations.

In the event that site limitations preclude removal of all contaminants to levels which do not exceed the standards identified in Exhibit II.F-1, the Area would undergo closure as a land disposal unit. This contingent closure would be performed in accordance with the standards and requirements of 264.310, 264 Subpart G, and UAC R315-8-14.5, including, but not limited to:

- Run-on/run-off control measures;
- Placement and maintenance of a unit cover (soil and/or synthetic);
- Installation, maintenance, and monitoring of a groundwater monitoring system;
- Inspection of and maintenance for subsidence and/or erosion control; and
- Such modification of the closure plan would be submitted to DEQ for approval.

II.F1.2 Description of Maximum Unclosed Portion during the Active Life of the Facility: 264.112(b)(2); R315-8-7

Because of the nature of OB/OD operations, the entire OB/OD Area will remain unclosed during the active life of the facility. However, as noted in Section II.F.1.1 above, the entire OB/OD Area will undergo closure at the completion of its active life.

[redacted]

EXHIBIT II.F-1
PROPOSED SOIL CLEANUP LEVELS

PARAMETER	PROPOSED CLEANUP LEVEL (mg/kg)
Priority Pollutant Metals	
Arsenic (As)	7E+02
Barium (Ba)	3.5E+04
Cadmium (Cd)	3.5E+02
Chromium (Cr) - +6	3.5E+03
Mercury (Hg) - inorg.	2.1E+02
Lead (Pb)	2E+03
Selenium (Se)	2E+02
Silver (Ag)	2.1E+03
Explosives	
HMX	3.5E+04
RDX	2.1E+03
Picric Acid	1E+02
2,4,6 TNT	3.5E+02
2,4 DNT	6.9E+02
2,6 DNT	6.9E+02
NO_2 - NO_3 (as N)	8E+04
Nitroglycerin	3.5E+04

II.F1.3 **Estimate of Maximum Waste Inventory in Storage and Treatment during Facility Life**: 264.112(b)(3); R315-8-7

Because of the highly variable nature of OB/OD activities, Exhibit II.F-2 is presented to summarize/characterize recent year (in relation to the date of the permit application) activities. This summary inventory of wastes is based upon available records (covering the period from July 1989 through February 1993). During the active life of the facility, all hazardous wastes brought to the facility will be subject to destruction (within the parameters presented in this permit application) by burning or detonation.

II.F1.4 **Description of Procedures for Removal or Decontamination of Hazardous Waste Residues, Equipment, Structures, and Soils**: 264.112(b)(4), 264.114; R315-8-7

As noted above in Section II.F1.1, it is the Army's preferred intent that all contaminated ash residue and soils will be removed to EPA action level/risk-based standard levels upon cessation of OB/OD Area operations. This removal will consist of excavation, containerization, proper manifesting, transportation, and disposal. The contaminated ash residue and/or soils will be disposed of at an offsite disposal facility permitted to accept the contaminated materials. Contaminated residues and soils will be removed from those areas where the Exhibit II.F-1 parameters are found in concentrations greater than their corresponding proposed cleanup target levels. The cleanup areas will be identified by using a sampling network similar to that referenced in the August 1993 Soil and Groundwater Investigation Report (see Appendix II.G-1). This sampling program identified a number of soil sample locations surrounding each burn pan, geographically distributed soil borings throughout the OB/OD Area (to detect contaminants originating from either burning or detonation operations), and located soil and groundwater sampling points along upgradient and downgradient pathways. As the groundwater sampling locations were installed as monitoring wells, these wells would be used to detect groundwater contaminants which could be attributed to OB/OD operations.

As stated previously, the investigatory efforts conducted to date have not positively identified groundwater contamination attributable to OB/OD operations. Therefore, groundwater contamination is not expected to be found at the time of closure; although sampling will be conducted to determine if that it is the case. As a contingency, if groundwater contamination is detected (i.e., Exhibit II.F-1 parameter concentrations are found above background levels), additional investigatory efforts will be performed to define the extent of contamination. Pending the results of these investigatory efforts, the closure plan would be modified, in accordance with regulatory requirements to address this contamination. Details on the soil characterization sampling program and analytical methods are provided in Section II.F.1.6 below.

Contaminated materials removed in the process of closing the OB/OD Area will be staged, at a temporary staging area located within an uncontaminated area of or adjacent to the OB/OD Area, for subsequent containerization and transportation offsite. This staging area will consist of an impervious pad (e.g., concrete or asphalt) surrounded by a curb to prevent run-on and run-off. A sump, or similar functioning construction, will be used to contain precipitation run-off from materials within the staging area. Liquids resulting from precipitation falling on the staging area will be pumped to containers or to a tanker for subsequent offsite disposal at a facility permitted to accept these wastes.

The refractory from the brick-lined burn pan would also be removed (if found to be contaminated at levels equal to or in excess of the action levels/risk-based standards), containerized, manifested, transported, and disposed of at a facility permitted to accept the contaminated materials. The two unlined burn

EXHIBIT II.F-2
WASTE ACTIVITIES SUMMARY

Year	No. of Days Used	Max. Daily Net Explosive Weight (lbs.)	Max. Daily Total Weight (lbs.)	Annual Net Explosive Weight Total (lbs.)	Annual Total Weight (lbs.)
Open Burn					
1989	1	20	N/A	20	N/A
1990	0	--	--	--	--
1991	3	500	N/A	1,260	>1,260
1992	2	22.2	1,000	44.4	1,377
1993	0	--	--	--	--
Open Detonation					
1989	0	--	--	--	--
1990	3	200	N/A	370	N/A
1991	3	12	N/A	19.5	>570
1992	15	3,471	3,663	>4,846	>11,054
1993	2	14	627	17	644

pans and the burn pan from which the refractory has been removed would then be deconned and disposed of as scrap metal. It should be noted that the burn pans and their supports are the only equipment in-place at the OB/OD Area. The burn pans and supporting metal structures would be deconned in-place using a process referred to as "flashing." In this process, an appropriate fuel and oxidizer is used to "flash" the surface of a burn pan to a temperature sufficient to cause the auto-ignition and/or decomposition of any wastes or residues remaining in the pan. Any residues or contaminated soils resulting from this process will be managed in the same manner as noted above for other contaminated residues and soils.

To ensure the effectiveness of decontamination using the "flash" process, samples of the final rinsates will be obtained and analyses performed for characteristic contaminants (refer to Section II.B.). If contaminants remain, the burn pan(s) will be further decontaminated using sand blasting, high pressure sprays, and/or washes and rinses to obtain complete decontamination as demonstrated by wipe samples. Sands, grit, and liquids used in this decontamination process will be collected, containerized, manifested, and transported offsite for disposal at a permitted disposal facility.

The Area will be restored and recontoured, to approximate existing contours, using soils obtained from borrow areas at Dugway Proving Ground. The Area will then be revegetated with native species using seed and/or plants transplanted from other Dugway Proving Ground.

As noted in Section II.F1.1 above, if site conditions preclude the removal of all contaminated residues and soils to the cleanup levels identified in Exhibit II.F-1, the OB/OD Area will be closed as a land disposal unit. This contingent closure would be performed in accordance with the standards and requirements of 264.310, 264 Subpart G, and UAC R315-8-14.5, including, but not limited to:

- Run-on/run-off control measures;
- Placement and maintenance of a unit cover (soil and/or synthetic);
- Installation, maintenance, and monitoring of a groundwater monitoring system; and
- Inspection of and maintenance for subsidence and/or erosion control.

II.F1.5 **Location of Disposal Facility**: 264.112(b)(3), 264.114; R315-8-7

As noted above in Section II.F1.4, contaminated residues, soils, bricks, and solids and liquids (see the prior staging area precipitation collection and decon procedure discussions) will be manifested and transported to a permitted offsite disposal facility. At the time of this permit application's writing, a potential disposal facility, pending acceptance analyses at the time of disposal, for OB/OD Area wastes is the USPCI Grassy Mountain facility.

II.F1.6 **Methods of Sampling and Testing Soils**: 264.112(b)(4), 264.114; R315-8-7

Surface (i.e., 6 to 12 inches depth) and subsurface (i.e., 4 to 5 foot depth) samples will be collected at the locations identified in Section II.F1.4 above. It should be noted that these locations are situated to accomplish biased-sampling (a minimum of eight samples) in the areas of each burn pan, while collecting a minimum of five other samples along topographic features (the washes leading into and away from the unit) and a minimum of thirty-two samples at geographically distributed locations throughout the OB/OD Area. As appropriate following this characterization effort, additional soil samples may be collected to further define the extent of contamination at any "hot spots" which may have been detected. The parameters and analytical methods are identified in Exhibit II.F-3 (refer to Section II.B. for further details on the selection of analytical parameters).

II.F1.7 <u>Criteria for Determining Decontamination Levels</u>: 264.112(b)(4), 264.114; R315-8-7

The criteria to be used in determining decontamination levels are the cleanup levels, which are presented in Exhibit II.F-1. These levels will be applied to samples of final rinsates, which will be used to establish the thoroughness of equipment/facility decontamination. The soil cleanup levels have been developed using the following assumptions:

- Dugway will not become a residential area in the next 30 years;
- Consideration of a drinking aquifer is not necessary; and
- Following closure, public access will still be limited for several years.

Using these assumptions, it was concluded that soil cleanup levels protective of a human adult working in the closure area would offer sufficient protection. Therefore, EPA oral reference dose values (RFD) and the EPA adult model criteria, i.e., 70 kg. person who ingests 100 mg of soil per day, were used to develop the majority of the cleanup levels. Since EPA has not established RFDs for lead and selenium, 1/100 of the minimum effective biological dose (MED) has been used to establish cleanup levels for these compounds.

Health advisories and regulatory standards for the major constituents of the reactives and explosives were used to establish cleanup levels for these compounds. Proposed cleanup levels are shown in Exhibit II.F-1.

II.F1.8 <u>Description of Additional Activities Performed during Closure</u>: 264.112(b)(5); R315-8-7

As noted above, groundwater sampling will be conducted for the purpose of ensuring the completeness of closure. As of the preparation of this permit application, wells installed during the soil and groundwater investigations in June 1993 will be used for the purpose of determining if OB/OD-related contaminants are present in groundwater below the unit. While recent investigations confirm that OB/OD activities have not had an impact on groundwater below the unit, these additional investigatory activities will help to ensure that complete characterization is provided and that maximum protection to human health and the environment is provided. In the event groundwater contamination is found, this Plan will be modified, in accordance with regulatory requirements, to incorporate appropriate investigatory and closure actions. No other leachate collection or run-on/run-off control activities are planned during closure.

II.F1.9 <u>Description of Closure Schedule</u>: 264.112(b)(6), 264.113; R315-8-7

Closure of the OB/OD Area is planned to proceed along the following schedule:

<u>Step</u>	<u>Time (Days)</u>
Notify DEQ of intent to close OB/OD Area	(-) 60
Begin closure	0
Determine presence and extent of soil/residue contamination	60

EXHIBIT II.F-3
ANALYTICAL PARAMETERS/METHODS FOR CLOSURE SOIL SAMPLES

PARAMETER	PREPARATION	ANALYSIS	DETECTION LIMIT (mg/kg)
Priority Pollutant Metals			
Arsenic (As)	3050	6010	5.3
Barium (Ba)	3050	6010	0.2
Cadmium (Cd)	3050	6010	0.4
Chromium (Cr)	3050	6010	0.7
Lead (Pb)	3050	6010	4.2
Mercury (Hg)	7471	7471	0.1
Selenium (Se)	3050	6010	7.5
Silver (Ag)	3050	6010	0.7
Explosives			(ug/L)
HMX	3510	8310	100
RDX	3510	8310	30
Picric Acid	3510	8310	500
2,4,6 TNT	3500	8090	1
2,4 DNT	3500	8090	1
2,6 DNT	3500	8090	1
NO_2 - NO_3 (as N)	--	9200	10
Nitroglycerin	--	1010, 9040, 1310	--

Step	Time (Days)
Excavate, decontaminate, and dispose of soil/residues/equipment	120
Conduct groundwater monitoring	120
Place final soil cover and grade to control run-on/run-off	160
Submit closure certification to DEQ	180

Please note, as discussed previously, if groundwater contamination related to OB/OD activities is found, it will be necessary to modify this Closure Plan. Therefore, an extension, to 480 days, of the required closure time of 180 days would be required to complete additional groundwater sampling, analysis, and characterization efforts.

II.F1.10 **Estimate of Year of Closure**: 264.112(b)(7); R315-8-7

The unit's year of closure cannot be estimated at this time as the unit is planned to be used through the life of the Dugway Proving Ground. There are no current plans to cease Dugway Proving Ground or OB/OD activities.

II.F1.11 **Extension of Closure Time**: 264.113(a), 264.113(b); R315-8-7

Refer to the discussion in Section II.F1.9 above.

II.F2 COPY OF POST-CLOSURE PLAN: 264.117, 264.118, 264.603; R315-8-7, R315-8-16

II.F2.1 **Post-Closure Care Mechanism**: 264.603, R315-8-16

As the Army intends to clean close the OB/OD Area, there is no requirement for post-closure care and maintenance. However, in the event site limitations preclude the removal of all contaminants to levels which do not exceed the cleanup levels presented in Exhibit II.F-1, the area will undergo closure as a land disposal unit. In this case post-closure care will fully comply with the requirements of 264.603, 264.601, 264.118, and UAC R315-8-16.

II.F2.2 **Description of Maintenance, Monitoring, Inspection and Frequencies**: 264.118(b)(1), 264.118(b)(2); R315-8-7

As noted previously, the Army intends to clean close the OB/OD Area. Therefore, the requirements for post-closure maintenance, monitoring, and inspection do not apply. However, if site conditions preclude the removal of all contaminants to levels which do not exceed the cleanup levels presented in Exhibit II.F-1, the unit will be closed as a land disposal unit and appropriate maintenance, monitoring, and care procedures will be developed and implemented. These procedures, which will fully comply with the requirements of 264.118(b)(1), 264.118(b)(2), and UAC R315-8-7, will include, but not be limited to, the following:

Inspection Plan: Including inspection procedures, frequency of inspection, logs, items (e.g., security control, erosion control, cover, and run-on/run-off control) to be inspected, potential problems, and resolutions to potential problems.

Monitoring Plan: Describing monitoring requirements and, as appropriate, groundwater collection/treatment operations.

Maintenance Plan: Describing preventive and corrective maintenance procedures and practices, including potential problems, problem resolution, recording problems and their resolution, and equipment requirements.

II.F2.3 Identification and Location of Person Responsible for Storage and for Updating Facility Copy of Post-Closure Plan: 264.118(b)(3); R315-8-7

The Environmental Program Office Chief will be the facility contact during the post-closure care period.

II.F3 COPY OF MOST RECENT CLOSURE AND POST-CLOSURE COST ESTIMATE: 264.142, 264.144, 270.14(b)(15), 270.14(b)(16); R315-8-8, R315-3-5, R315-3-7

As noted in 264.140(c), the Federal government is exempt from the requirements of Subpart H - Financial Requirements.

II.F4 COPY OF DOCUMENTS USED AS FINANCIAL ASSURANCE MECHANISM: 264.143, 264.145, 164.146; R315-8-8

As noted in 264.140(c), the Federal government is exempt from the requirements of Subpart H - Financial Requirements.

II.F5 DOCUMENTATION OF NOTICE ON DEED: 270.14(b)(14), 264.119; R315-3-5, R315-3-7, R315-8-7

Within 60 days after certification of closure of the OB/OD Area, the Installation Commander will submit the notices required in 40 CFR 264.119 (and incorporated by reference in UAC R315-8-7) to protect human health, including future land owners, and the environment.

II.F6 COPY OF INSURANCE POLICY: 264.147; R315-8-8

As noted in 264.140(c), the Federal government is exempt from the requirements of Subpart H - Financial Requirements.

II.G. **PROTECTION OF GROUNDWATER**

II.G.1 **Regulated Unit**: 270.14(c), 270.23(b), 264.90(a)(2); R315-3-7(a), R315-3-6(a)(8), R315-8-6.1(a)

The Dugway Subpart X OB/OD Area, as described in Sections II.A1.3 and III.A, has been in use in this location for over 30 years (Exhibit II.G-1). Because of this relatively extended period of time during which material was detonated and burned in the area, the potential for soil and groundwater contamination must be assessed. Four groundwater monitoring wells were installed in the immediate area of the OB/OD Area, as shown in Exhibit II.G-2.

II.G.2 **Existing Groundwater Monitoring Data**: 270.14(c)(1), 270.23; R315-3-7(a), R315-3-6(a)(8)

As indicated above and shown in Exhibit II.G-2, four groundwater monitoring wells have been installed within the unit area at four soil boring locations (B-2, B-4, B-6, B-8), which were drilled to first (shallowest) water approximately 97 feet below ground surface. All wells were installed within the perimeter of the unit. An additional groundwater sample was collected from within an auger at a fifth deep boring location (B-17), although a monitoring well was not installed within this borehole. Well construction information is presented in Exhibit II.G-3 and detailed well construction information is included in Appendix II.G-1. Each well was completed with 2-inch PVC, schedule 80, with the bottom 15 feet of each well casing constructed of 0.10-inch slotted well screen. The well annulus between the well screen and the inside of the boring was backfilled with #10-20 clean silica sand, with 5 feet of bentonite pellets emplaced above the silica sand. Bentonite grout was backfilled (tremied) atop the bentonite pellets to ground surface, and each well was capped with a 2-inch waterproof locking cap with a steel cover set in a concrete pad.

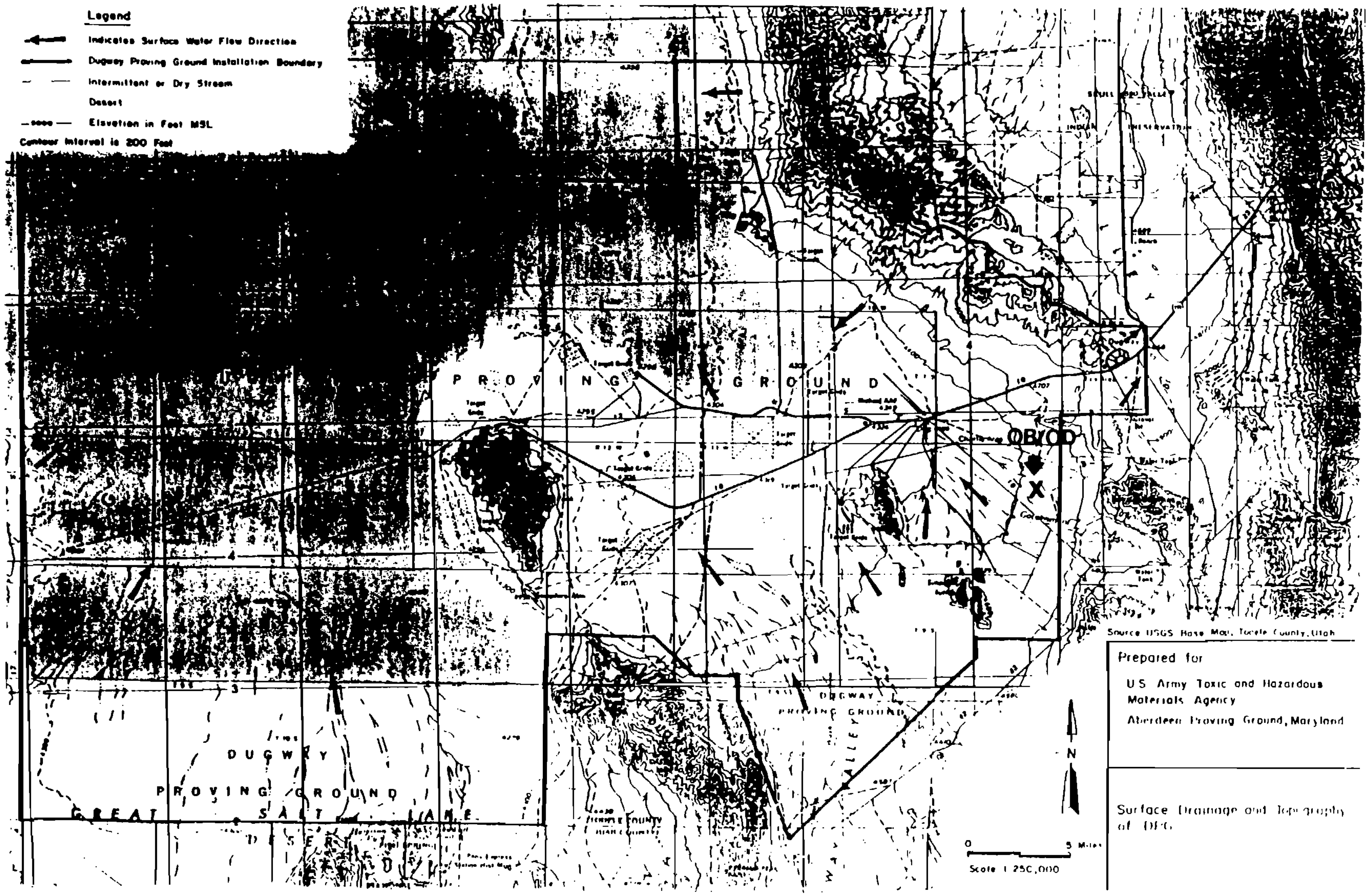
Groundwater sampling and analysis information is detailed in Appendix II.G-1, and is summarized below and in Section II.G5. Exhibit II.G-4 summarizes groundwater quality data for samples from Wells No. B-2, B-4, B-6, and B-8, and boring B-17, which were collected during May and June of 1993. Detailed chemical analytical data are included in Appendix II.G-1. These data indicate that no explosive residues analyzed for were detected above the quantification limit within site groundwater. Metals were also analyzed for in site groundwater samples, and barium, cadmium, chromium and lead were detected at or above the quantification level in some of these samples. Well No. B-17 was also sampled for organic chemicals (volatile and semivolatile constituents), as shown in Exhibit II.G-4. No volatile or semivolatile organic compounds that were analyzed for were detected in the groundwater samples collected.

The closest wells outside of the OB/OD Area are production Wells No. 3, 4, 5, and 29 (Exhibit II.G-5). All of these wells are downgradient of the unit. Available water quality data for these wells is presented in Exhibit II.G-6, and well construction information is presented on Exhibit II.G-6. These data indicate that the water-bearing zone over which these wells are screened is over 300 feet below ground surface. Groundwater quality of water extracted from these wells is "hard" (150-250 mg/l $CaCO_3$), but is potable. Shallower water-bearing zones are present above the drinking-water zones in the Wells No. 3, 4, 5, and 29 areas, but shallower water is not potable.

Groundwater quality data from Wells No. 3, 4, 5, and 29 indicate that calcium, magnesium, chloride, sulfate and sodium are the major ions present in groundwater which affect drinking water quality, with potassium and fluoride present as minor ions. Concentrations of the individual major ions generally exceed 5,000 ug/l, but the water supply well closest to the OB/OD Area, Well No. 29, exhibits total dissolved solid concentrations (TDS) in excess of 500,000 ug/l, well above the Safe Drinking Water Act secondary water quality standard for TDS (Exhibit II.G-6). Metals and other inorganic constituent concentrations such as arsenic, mercury, and nitrate/nitrite are generally

[redacted]

Exhibit II.G-1: Location of OB/OD Unit and Surface Water Features at Dugway Proving Ground (EBASCO, 1992)



AAA ENGINEERING & DRAFTING, INC.
1865 SOUTH MAIN, SUITE 12
SALT LAKE CITY, UTAH 84115

Project Engineer | License No.

Rev.	Date	
B	6-09-93	DRILL HOLES AND SAMPLE LOCATIONS ADDED
A	9-18-90	1000' CIRCLE ADDED

Project Location
LOCATED IN SECTIONS 10, 11, 14, & 15
T. R. W., S.L.B. & M.
DUGWAY PROVING GROUND, UTAH

MAP OF O.B./O.D. AREA
FOR A.T. KEARNEY

Horiz. Scale 1" = 200'	Checked	SHEET NO.
Contour Int. 2'	Date	
Designed	Date	
Drafted 8-25-89	Date	OF ______ SHEETS

Exhibit II.G-3: Well Construction Data, OB/OD Unit

Well Number	Total Depth (ft)*	Screened Interval (ft)**	Sand Pack (ft)**	Bentonite Seal (ft)**	Cement/Grout (ft)**
B2	97	96.5 - 82	97 - 80	80 - 75	75 - ground surface
B4	97	96.5 - 82	97 - 80	80 - 75	75 - ground surface
B6	97	96.5 - 82	97 - 79	79 - 74	74 - ground surface
B8	97	96.5 - 80	97 - 77	77 - 70	70 - ground surface

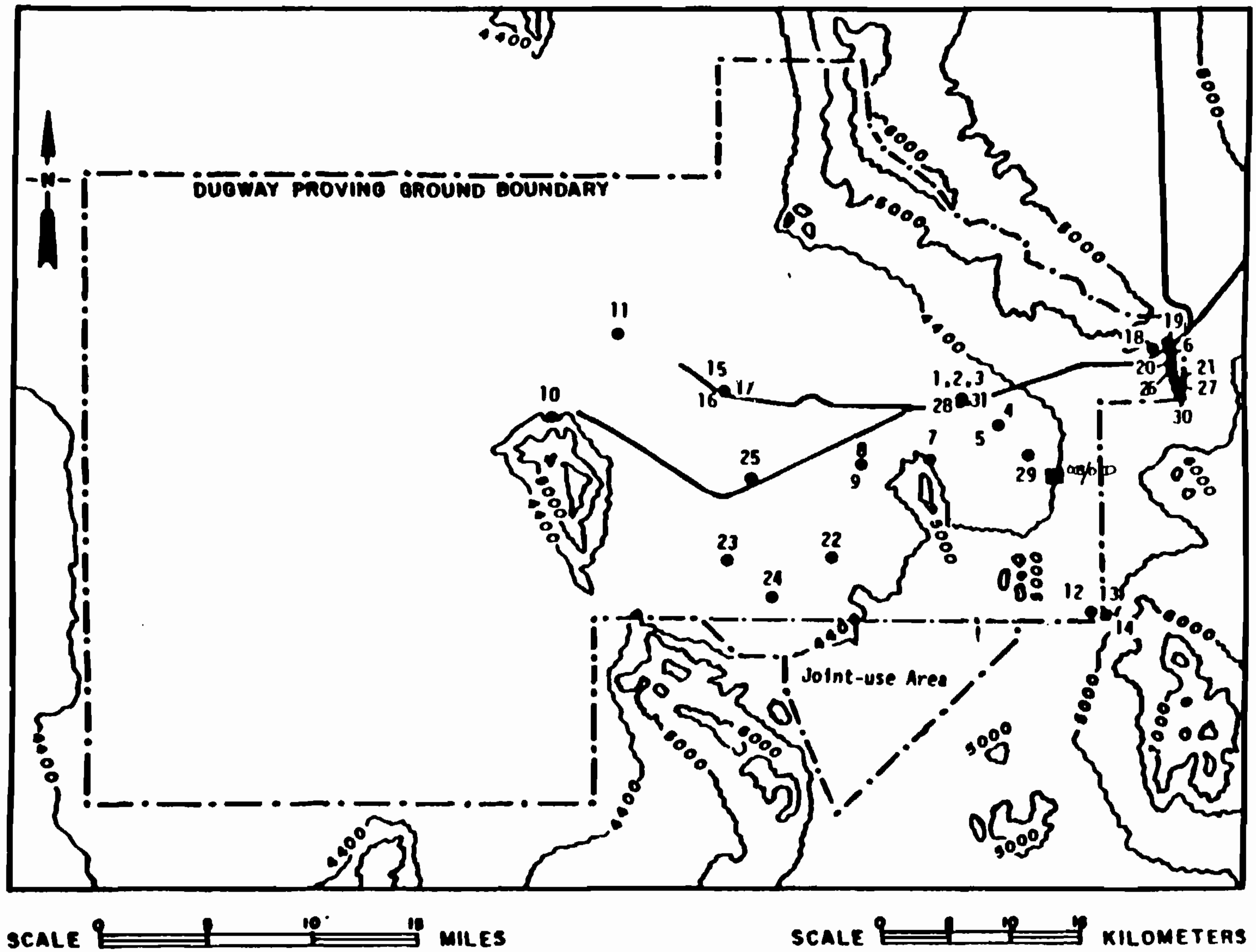
* All measurements approximates from Appendix II.G-1.
** Depth below ground surface.

Exhibit II.G-4: Summary of Groundwater Analytical Results OB/OD Area, Dugway Proving Ground (Kleinfelder, 1993)

		EXPLOSIVE RESIDUES					METALS CONCENTRATIONS (mg/L)							
Sample I.D.	Location	DNT	HMX	RDX	TNT	Nitro Glycerine	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
DPG62893503	B-2	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.089	0.004	0.02	<0.05	<0.001	<0.005	<0.01
DPG693567	B-4	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.12	<0.004	<0.01	<0.05	<0.001	<0.005	<0.01
DPG62893505	B-6	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.099	<0.004	0.01	<0.05	<0.001	<0.005	<0.01
DPG62893504	B-8	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.072	<0.004	0.01	0.05	<0.001	<0.005	<0.01
DPG593547	B-17	<0.01	<0.02	<0.02	<0.01	<0.02	<0.005	0.045	<0.004	<0.01	<0.05	<0.001	<0.005	<0.01
DPG593548	B-17	<0.01	<0.02	<0.02	<0.01	<0.02	<0.005	0.047	<0.004	<0.01	<0.05	<0.001	<0.005	<0.01

-- Not Analyzed

Exhibit II.G-5: Location of Groundwater Production Wells at Dugway Proving Ground (A.T. Kearney, 1988)



(Source: Dugway Proving Ground, 1982)

Exhibit II.G-6: Dugway Water Supply Well Sampling Results for August, 1989 (EBASCO, 1992)

ANALYSIS	WELLS SAMPLED								BLANKS			STANDARDS
	WELL 3	WELL 5	WELL 18	WELL 19	WELL 26	WELL 27	WELL 28	WELL 29	FIELD	TRIP	METHOD	SDWA
GC/MS Volatiles	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Tetrachloroethene			1.60									
GC/MS Semivolatiles	BDL	BDL		BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Bis(2-ethylhexyl)phthalate			22.0									
UNK633			20.0									
ICP Metals												
Calcium	30,700	49,400	37,000	42,700	59,900	40,200	37,000	38,700	129		BDL	
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		BDL	10(P)
Chromium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		BDL	50(P)
Copper	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		BDL	1,000(S)
Potassium	12,900	7,990	21,200	19,800	8,680	5,320	12,400	5,990	BDL		BDL	
Magnesium	15,800	28,400	84,700	115,000	25,100	29,400	14,900	30,600	BDL		BDL	
Sodium	31,600	24,700	34,100	37,000	27,100	26,100	32,600	25,700	BDL		BDL	
Lead	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		BDL	50(P)
Zinc	BDL	56.8	89.6	BDL	BDL	BDL	BDL	BDL	BDL		BDL	5,000(S)
Nitrate/Nitrite	84.8	89.2	51.2	86.2	63.3	94.1	109.0	87.4	102	16.7	BDL	10000/1000(P)
Phosphates	22.1	11.6	11.9	18.0	20.1	19.5	26.4	16.9	BDL	BDL	BDL	
Anions												
Chloride	3,310	1,560	3,850	4,090	2,150	1,780	3,520	1,710	BDL	BDL	BDL	250,000(S)
Fluoride	1,650	939	2,220	2,370	1,160	1,080	1,470	1,140	BDL	BDL	BDL	4,000(P)
Sulfate	792	362	2,260	3,080	339	629	836	648	BDL	BDL	BDL	250,000(S)
Total Dissolved Solids	1,000,000	622,000	2,320,000	2,730,000	680,000	635,000	1,040,000	599,000	BDL	BDL	BDL	500,000(S)
Thiodiglycol	*	*	*	*	*	*	*	*	*	*	*	
Organosulfur Compounds	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
DIMP/DMMP	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Total Organic Carbon (TOC)	BDL	BDL	1,250	1,840	BDL	BDL	BDL	BDL	BDL	BDL		
Explosives	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Mercury	0.15	0.134	0.113	BDL	0.108	0.108	BDL	0.149	BDL	BDL	BDL	2(P)
Cyanide	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	
Arsenic	6.39	BDL	BDL	BDL	9.05	14.50	5.63	19.10	BDL	BDL	BDL	50(P)
Temp (Field - °C)	16	14	17	15.5	14.8	17	16	16	--	--	--	
pH (Field - no units)	7.88	7.31	7.36	7.55	7.75	7.92	7.92	7.90	--	--	--	6.5-8.5(S)
Conductivity (Field - umhos)	1,450	930	2,950	3,290	910	820	1,500	850	--	--	--	

All results reported as ug/l unless otherwise indicated. BDL = Below Detection Limit * = Sample Analysis Out-of-Control P = Primary S = Secondary less than SDWA standards. Organic constituents were not detected in waters from Wells No. 3, 4, 5, and 29.

II.G.3 **Identification of Uppermost Aquifer and Aquifers Hydraulically Interconnected Beneath the Facility Property**: 270.14(c)(2), 270.23; R315-3-6(a)(8), R315-3-7(a)(2)

Before the uppermost aquifer underlying the OB/OD Area can be discussed in sufficient detail, the general geology and site-specific geology should be discussed to introduce the geologic features which control and affect groundwater flow. General geology and site-specific geology are discussed below, followed by site hydrologic information.

II.G.3.a **General Geology**: 270.14(c)(2), 270.23; R315-3-6(a)(8), R315-3-7(a)(2)

Dugway Proving Ground is located in southeastern Utah within the Basin and Range Physiographic Province. This Province is characterized by relatively linear mountain ranges trending north-south, which are flanked on the east and west by intermontane plains. The area is characterized by tectonism, with current mountain ranges created via block faulting initiated by extensional tectonic regime(s) that began during the late Mesozoic to early Cenozoic Eras. Normal faults abut the flanks of the upthrown mountain block adjacent to Dugway Proving Ground, and activity along these faults facilitated the uplift of igneous, metamorphic, and/or sedimentary pre-Cenozoic aged basement rock, to produce the mountain ranges near DPG. As implied in Exhibit II.G-7, Skull Valley and Dugway Valley, which are intermontane valleys that contain thick sedimentary rock units, are separated by the upthrown block of the Cedar Mountains. Dugway Proving Ground occurs principally within the Dugway Valley, and is abutted on its eastern margin by the Cedar Mountains and on the east by the Great Salt Lake Desert.

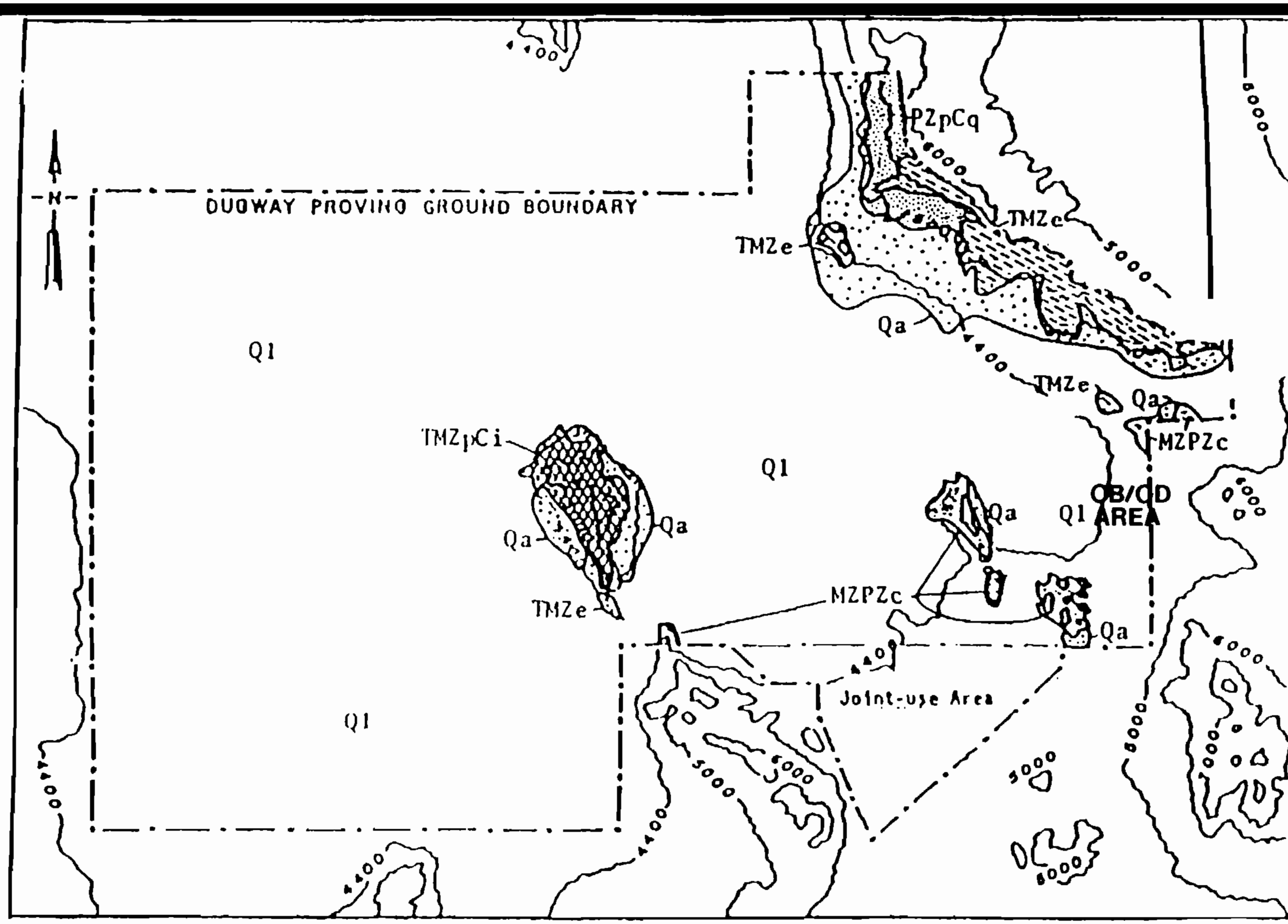
Exhibit II.G-8 presents the generalized stratigraphic column for the Dugway Basin. As shown in this exhibit, basement rock of the downthrown block is characterized by extrusive and intrusive igneous rocks of Precambrian to Mesozoic age, with metasedimentary carbonates and siliciclastic intervals. Alluvial/fluvial sediments were deposits above bedrock, although occasional igneous intrusions during the Cenozoic Era may have emplaced igneous dikes or sills penecontemporaneously with basin sedimentation.

Sedimentary units were deposited in the downthrown blocks abutting the upthrown mountain ranges, above the igneous/metamorphic basement rock, with sedimentation occurring for over 60 million years (late Mesozoic Era through the Recent Epoch). Below Dugway Proving Ground, over 1,000 feet of sediments have been deposited, upon bedrock in some locations, which were laid down under various depositional environments. Sediments deposited within the basins were derived, in part, from erosion of adjacent upthrown blocks and through volcanogenic sedimentation.

Tertiary-Quaternary aged "Older Alluvium," which can be over 1,000 feet thick, was deposited upon bedrock of the downthrown block via fluvial erosion of adjacent mountain ranges. This Older Alluvium (Exhibit II.G-7) is characterized by clay, sand, and gravel deposits, which outcrops or occurs near ground surface in the southeastern portion of Dugway Proving Ground.

Lacusterine sediments were deposited upon the "Older Alluvium." During the late Tertiary Period some 1.5 million years ago, intercontinental fresh water lakes were present throughout the interior of the United States, the largest of which occurred in Utah, Wyoming, and other western States. In the area of Dugway Proving Ground, Lake Bonneville was present within the Dugway Valley which, at its maximum, had a high water level elevation of 5,265 feet. When lake water level was this high, the block fault mountains in the Dugway area appeared as only "residual islands" within the Lake itself. Erosion of adjacent mountains deposited hundreds of feet of fluvo-lacustrine sediments

Exhibit II.G-7: Surface Geology of Dugway Proving Ground (USHWCB, 1992)



SCALE 0 5 10 15 MILES

FIGURE II-1 Geologic Map of Dugway Proving Ground (Source: References 10 and 11)

LEGEND

Qa		Alluvium and colluvium of Quaternary age
Q1		Lacustrine deposits of Quaternary age
TMZe		Extrusive igneous rocks of Mesozoic and Tertiary age
TMZpCi		Intrusive igneous rocks of Precambrian, Mesozoic, and Tertiary age
MZPZc		Sedimentary and metasedimentary carbonate rocks of Paleozoic and Mesozoic age
PZpCq		Sedimentary and metasedimentary quartzitic rocks of Precambrian and Paleozoic age

Exhibit II.G-8: Generalized Stratigraphic Column of Dugway Proving Ground (EBASCO, 1992)

Generalized Stratigraphy of DPG

ERA	AGE SYSTEM	UNIT	MAXIMUM THICKNESS (feet)	OCCURRENCE AND LITHOLOGY
CENOZOIC	Quaternary	Eolian Dune Sand	50	Linear dunes and barchans along margin of Great Salt Lake Desert, south of Cedar Mountains; fine-med. quartzose sand.
		Alluvium, Colluvium	400 - <200	Fluvial deposits of sand, gravel, boulders in stream channels, and in coalescing alluvial-fan deposits of coarse material along lower mountain slopes. Colluvial deposits of angular rock fragments locally on higher mountain slopes.
		Lacustrine Deposits	<100	Fluvial deposits and lacustrine marl, lakebed clays and silts, tufa and tufa cemented conglomerates deposited in valley flats; include surficial playa deposits, crystalline salt, lacustrine beaches, spits and near-shore bars.
	Tertiary and Quaternary	Older Alluvium	>1000	Fluvial clay, sand, and gravel, unconsolidated to well-cemented with calcium carbonate; exposed in higher part of Gov. Creek area; underlie most of the younger basinal deposits of the area.
MESOZOIC and CENOZOIC	Jurassic and Tertiary	Extrusive Igneous Rocks	-	Felsic to mafic lava, pyroclastics, tuffs, ignimbrites, breccias, some intrusives in most mountain ranges; interlayered locally with older alluvium.
PRECAMBRIAN, MESOZOIC, and CENOZOIC	Precambrian, Jurassic, Cretaceous, and Tertiary	Intrusive Igneous Rocks	unknown	Mainly porphyritic quartz monzonite and granitoid rocks; crop out in scattered locations in mountain areas.
PALEOZOIC and MESOZOIC	Mid. Cambrian - Triassic	Sedimentary and Meta-sedimentary Carbonate Rocks	unknown	Mainly limestone and dolomite with some shale beds, siltstone, sandstone, conglomerate. Locally altered by contact metamorphism where adjacent to intrusive rocks or overlain by extrusive igneous rocks.
PRECAMBRIAN and PALEOZOIC	Precambrian to ?	Sedimentary and Meta-Sedimentary Quartzitic Rocks	unknown	Mainly quartzites, but include phyllites, phyllitic shales, and argillites. Crop out in most mountain areas as resistant cliff-forming strata. Likely underlie younger rocks at depth in most of area.

Source: Utah DNR. 1978. No. 59., Dugway Valley-Government Creek Area, West-Central Utah.

within Lake Bonneville on top of "Older Alluvium." At present, sediments deposited along the shoreline of Lake Bonneville occur as visible terraces along the margins of mountain ranges near DPG.

With the recession of the ancestral Lake Bonneville, a second phase of alluvial-fluvial sediment deposition occurred atop the fluvial-lacusterine (lake) deposits, primarily around the margins of the lake and along the flanks of the downthrown basins. This "New" Alluvium/Colluvium consists of 200 to 400 feet of sand, gravel and other alluvial fan sediments, which were deposited along the slopes and at the bases of the mountain slopes, onto the valley or basin floor. In some locations, eolian (wind-blown) dune sand has been deposited atop the "New" Alluvium/Colluvium.

The stratigraphic column shown in Exhibit II.G-8, is not complete in all locations at DPG. For example, near the southern margin of the Government Creek Drainage, the lacusterine (lake) sediments are not present because they were either not deposited initially, or were eroded away, leaving the "old" alluvial deposits to outcrop in topographically higher areas. Also, the lacusterine deposits are present at ground surface in the center of the Dugway Valley, and are not covered by "New" Alluvium/Colluvium sediments. Exhibit II.G-9 is a regional cross section through the east-central portion of the Dugway Proving Ground which illustrates the significant lateral stratigraphic variation throughout DPG. Section III.B4.3 details the specific soil types which have developed upon the various sedimentary deposits in the Dugway area.

II.G.3.b **Site-Specific Geology**: 270.14(c)(2), 270.23; R315-3-6(a)(8), R315-3-7(a)(2)

Site-specific geologic data indicate that the OB/OD Area is floored by the fluvo-lacusterine deposits of Lake Bonneville, and no eolian or "New Alluvium" sediments are present. Exhibit II.G-10 presents a stratigraphic cross section through the OB/OD Area, illustrating vertical and horizontal stratigraphic variations underlying the unit. As shown in this exhibit, approximately 25 feet of light brown silty clay occurs immediately below the OB/OD Area. Below this horizon, stratigraphy varies laterally within a 50 to 60 foot thick interval from thick sequences of gravel and clay (i.e., B-8) to more thinly interbedded sands, clays, and gravels (i.e., B-4). An approximately 20-foot clay-rich zone is present ubiquitously below this 50 to 60 foot gravel-bearing interval throughout the OB/OD Area (Exhibit II.G-10). First water was encountered beneath this clay interval approximately 95 feet below ground surface; drilling logs show that groundwater level rose above the zone that the water was encountered within, indicating that the first water is present under confined to semi-confined conditions.

Total thickness of the fluvo-lacusterine sediments below the OB/OD Area is not known because boreholes were terminated at first water. However, data obtained from Wells No. 2, 3, 4 and 29 installed approximately 1 to 5 miles west of the unit imply that fluvo-lacusterine sediments can be approximately 100 feet thick in the OB/OD Area. The nature of the geologic contact between fluvo-lacustrine and "Old Alluvium" was not specified in literature, but a gradational contact between the two units is implied. As shown in Exhibit II.G-10, the clay-rich interval immediately below the unit grades vertically to interbedded clays, sands, and gravels below the OB/OD Area to at least 100 feet below ground surface, and based upon regional data, likely grades into underlying "Old Alluvium," 100 to 200 feet below ground surface.

II.G.3.c **Regional and Site-Specific Hydrogeology**: 270.14(c)(2); R315-3-7(a)(2)

Annual precipitation is six to eight inches per year in the vicinity of the OB/OD Area. Precipitation is lost primarily through evaporation or evapotranspiration, with only a very small fraction of the total precipitation available for run-off or to recharge local groundwater systems. Drainages flowing through DPG are ephemeral and intermittent, with surface water flow

Exhibit II.G-9: Regional Stratigraphic Cross Section, See Exhibit III.G-5 for Well Locations (A.T. Kearney, 1988)

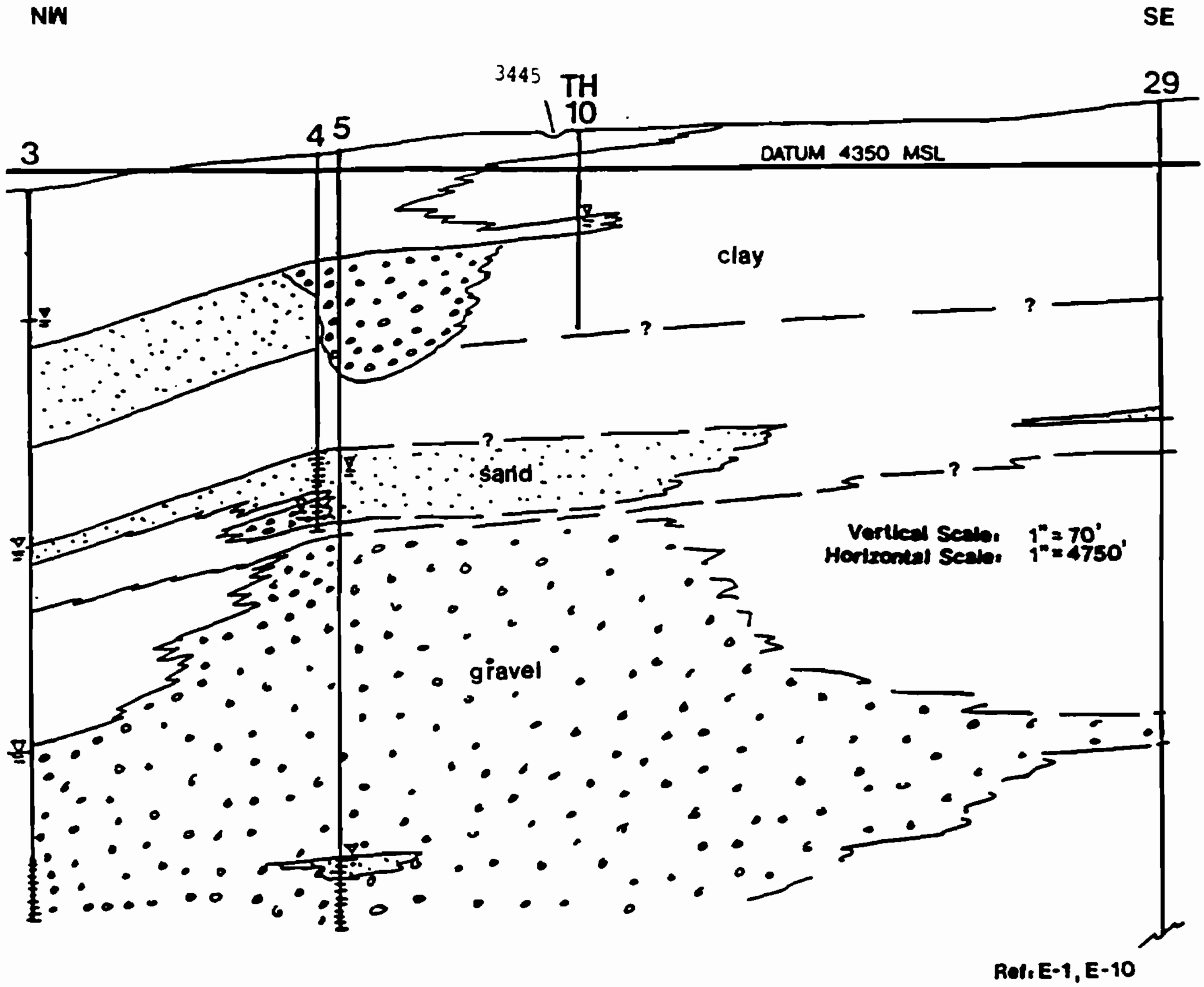
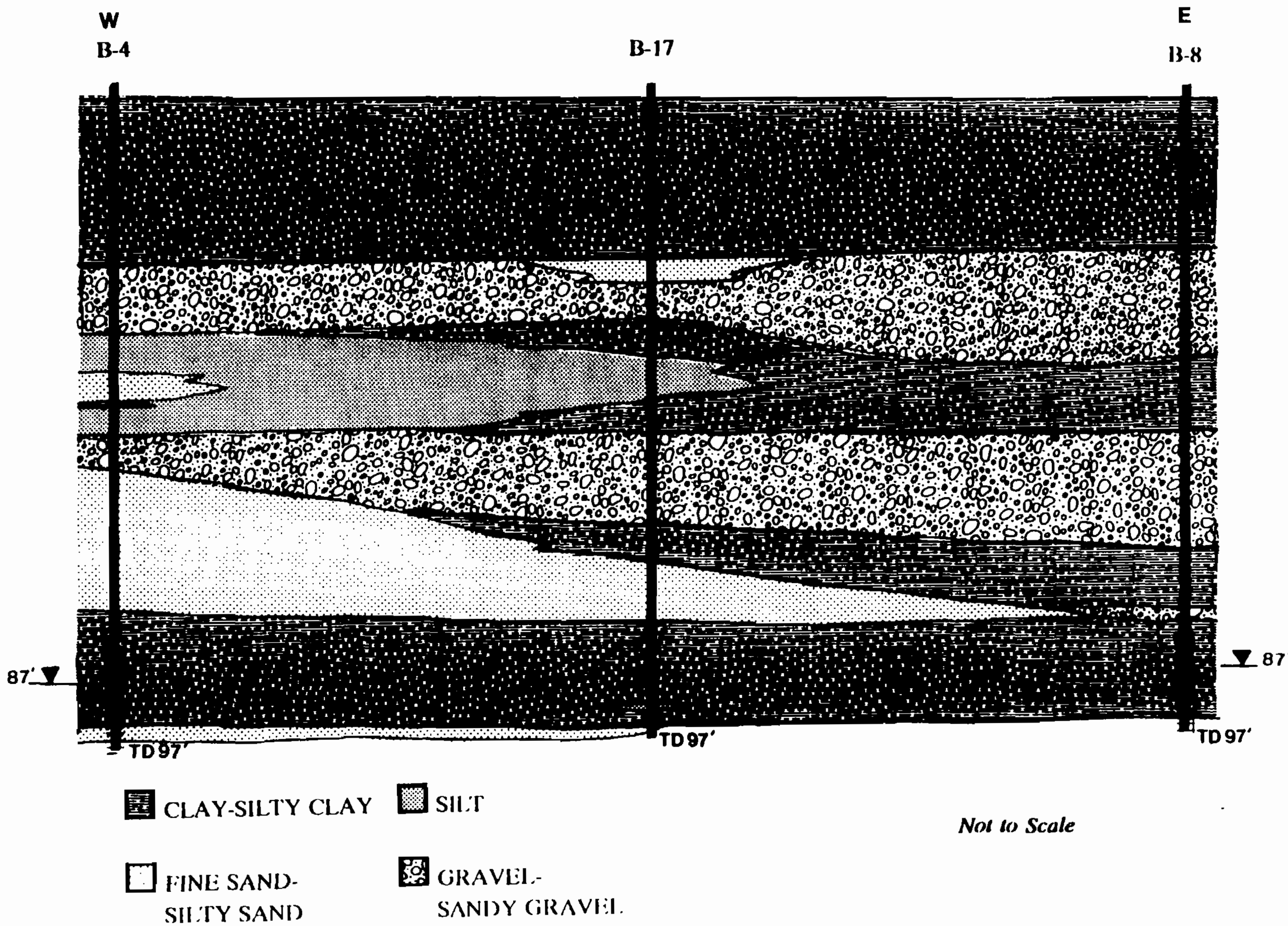


Exhibit II.G-10: Diagrammatic Local Stratigraphic Cross Section Through OB/OD Area (See Exhibit II.G-2 for Well Locations)



resulting from storm activity as well as from perennial streams in mountains adjacent to DPG. Runoff in the drainages either evaporates, infiltrates into the stream beds or flows into the desert floor, where it generally evaporates quickly. Government Creek is the nearest major drainage to the OB/OD Area and is approximately one mile southwest at its closest point. A detailed description of surface water is provided in Section III.B4.1.

Depth to groundwater and groundwater flow varies throughout DPG. A groundwater divide occurs along a bedrock high near English Village, with groundwater east of this flowing into Skull Valley and groundwater west flowing into the Dugway Valley. Depth to potable water varies between 80 feet in the English Village area, to over 300 feet in the Government Creek Valley, although shallower, brackish/saline water-bearing intervals occur above potable water aquifer(s). Potable water generally occurs within aquifers of the "old" alluvium, although shallow potable water zones have been noted, such as the aquifer encountered at a depth of approximately 200 feet below ground surface in the Carr-Government Creek area.

Groundwater quality at DPG ranges from saline to potable, and salinity increases to the west toward the Great Salt Lake Basin. The uppermost water-bearing interval in the OB/OD Area occurs within a silty-sandy interval approximately 95 to 97 feet below ground surface, although "slightly moist" sediments were encountered in intervals above 90 feet. Potable water aquifers are confined, and available data indicate that the uppermost water-bearing interval below the OB/OD Area may be confined or semi-confined because the static water level within each well is approximately eight feet above the water-bearing zone.

As shown in Exhibit II.G-10, sediments between ground surface and the first water-bearing interval at the OB/OD Area are comprised of gravels, sands, silts, and clays. Site-specific hydrologic data concerning these materials is not available, but Exhibit II.G-11 presents generalized horizontal hydraulic conductivities and porosities for these materials. Appendix II.G-1 presents the drilling logs for wells installed in the OB/OD Area, and includes discussions of the site-specific geologic materials.

II.G.4 <u>Groundwater Flow, Direction, Rate and Source of Information</u>: 270.14(c)(2), 270.23; R315-3-7(a)(2)

Regional groundwater flow west of the aforementioned groundwater divide is generally toward the Dugway Valley-Great Salt Lake Desert (Exhibit II.G-12). In the OB/OD Area, site-specific groundwater flow data indicate that groundwater flow within the uppermost water-bearing interval is to the northwest (Exhibit II.G-13). Hydraulic gradient in the OB/OD Area is 0.004 ft/ft. Site-specific hydraulic conductivity data are not available, but assuming that the aquifer is a silty sand to clay-rich silt, the optimal hydraulic conductivity could be approximately 10^{-5} m/s (3.28 x 10^{-5} ft/sec.). Given these estimates and assuming a porosity of 30% (Exhibit II.G-11), the lateral groundwater flow rate is approximately .04 ft/day. References (1992 Well Installation Plan) state that "the deeper, confined fresh groundwater zones recharge the shallower brackish zones," implying that an upward flow gradient of sufficient head occurs between lower and upper water-bearing intervals to allow said recharge. Interconnection of water-bearing intervals is not indicated due to the distinct differences in water quality, and intervening stratigraphic units which act as impediments to vertical groundwater flow. Because the intervals between ground surface and the first water-bearing zone are unsaturated and the interval contains porous zones which would contain vertically infiltrated water, the vertical infiltration rate is likely very low in the OB/OD Area.

Exhibit II.G-11: Typical Hydraulic Conductivity and Porosity Values for Geologic Media (Freeze and Cherry, 1979)

Media	Porosity Range (%)	Hydraulic Conductivity Range (m/s)
Gravel	25 - 40	10^{-3} to 1
Sand	25 - 50	10^{-6} to 10^{-2}
Silt	35 - 50	10^{-9} to 10^{-5}
Clay	40 - 70	10^{-12} to 10^{-9}
Sandstone	5 - 30	10^{-10} to 10^{-6}
Shale	0 - 10	10^{-13} to 10^{-9}
Fractured crystalline rock	0 - 10	10^{-8} to 10^{-4}

Exhibit II.G-12: Regional Groundwater Elevations and Flow Directions at Dugway Proving Ground (EBASCO, 1992)

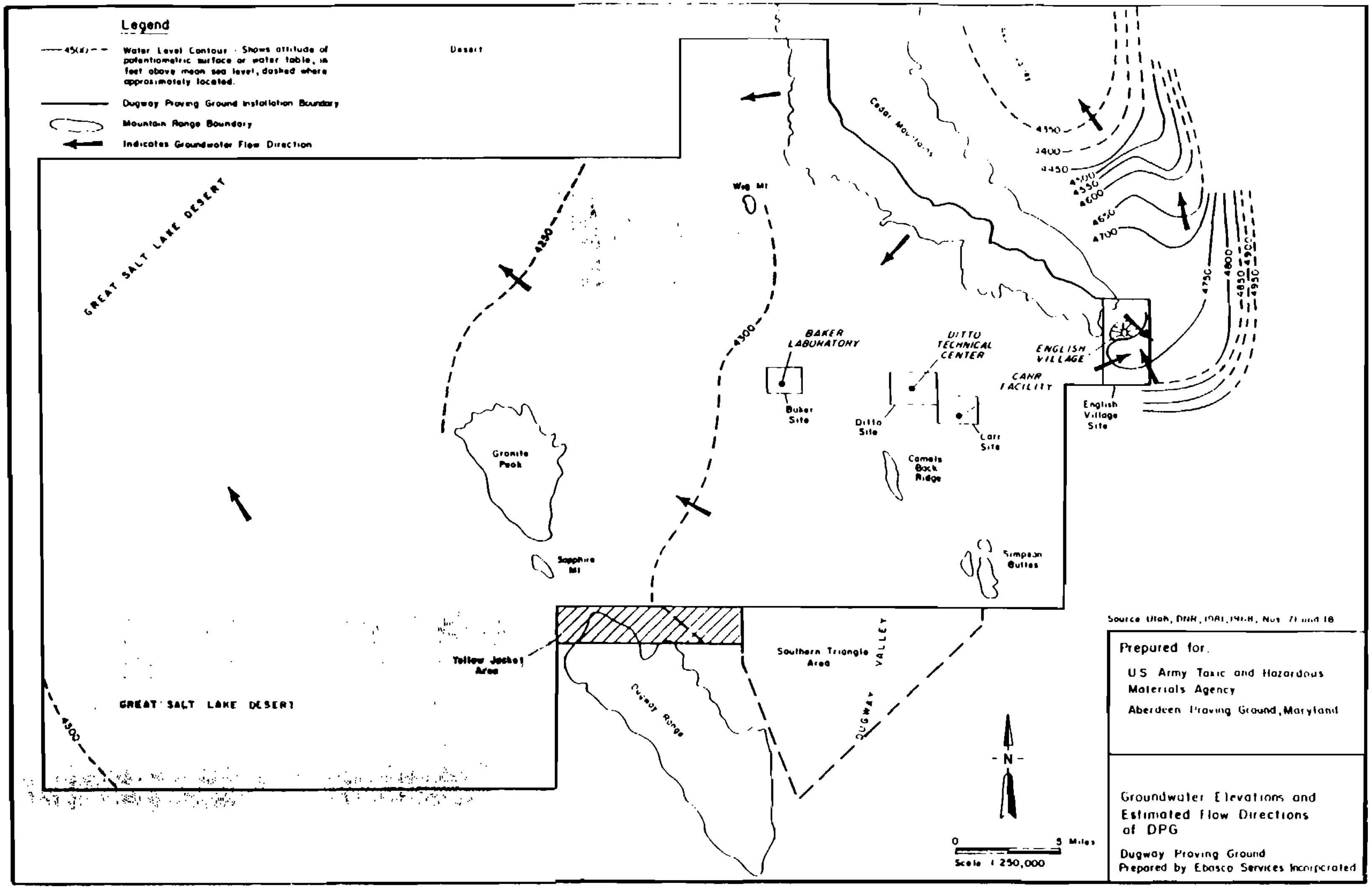
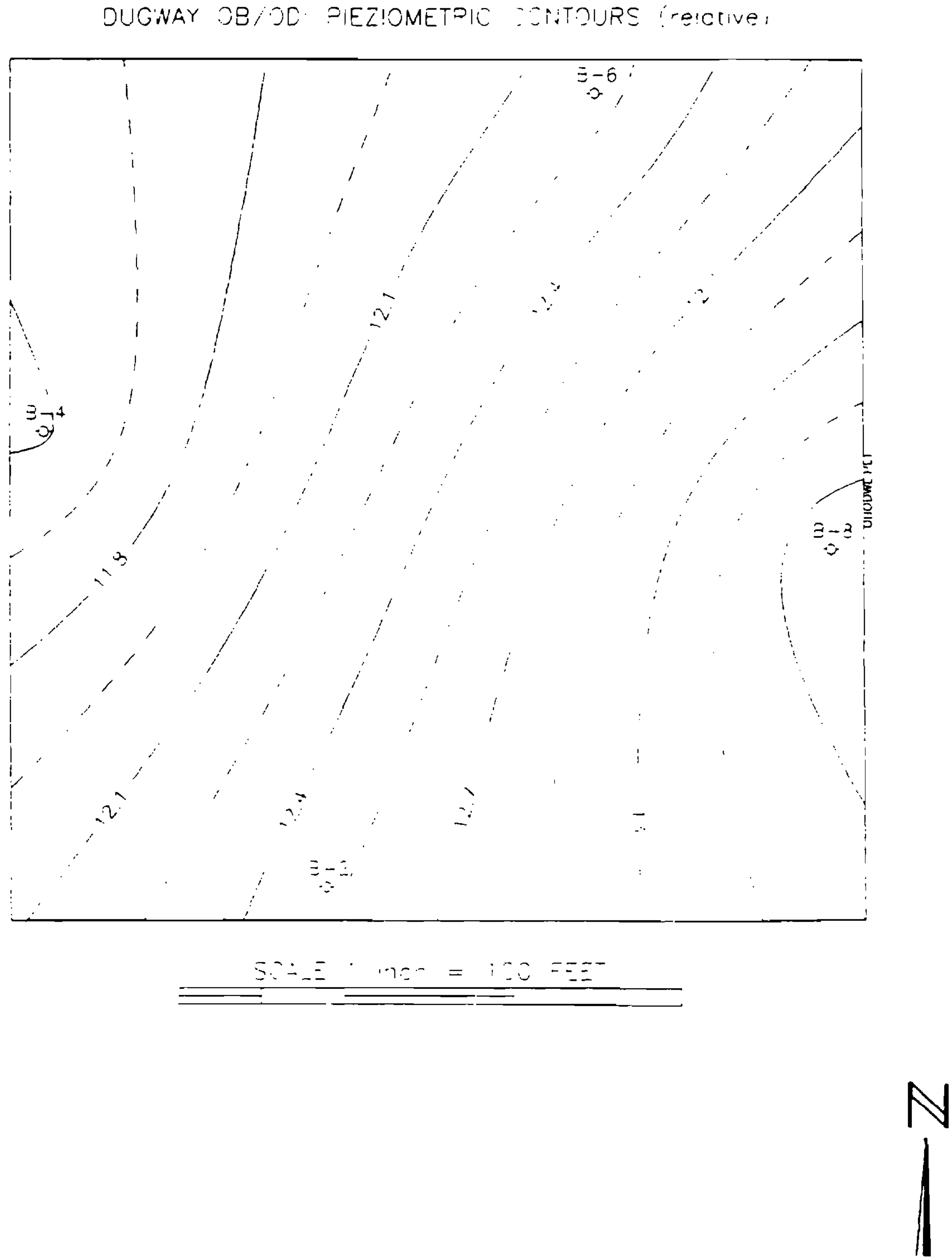


Exhibit II.G-13: Local Groundwater Elevations and Flow Directions, OB/OD Area (Kleinfelder, 1993)



II.G.5 **<u>Description of Any Plume of Contamination That Has Entered the Groundwater from a Regulated Unit</u>:** 270.14(c)(2), 270.23; R315-3-7(a)(2), R315-3-6(a)(8)

Groundwater quality data acquired during May and June of 1993 indicate that barium, lead, cadmium, and chromium were detected in groundwater samples collected from wells installed at the OB/OD Area (Exhibit II.G-4). Of these, barium is present in concentrations well below the secondary drinking water standards, and in concentrations consistent with regional groundwater quality (Exhibit II.G-6). Further, barium was detected in quality assurance/quality control samples, implying that barium within groundwater at least in part could have been introduced during the sampling process (Appendix II.G-1). Lead was detected in the groundwater sample collected from Well No. B-8 in concentrations slightly above the method detection limit. While this concentration is equivalent to the MCL for lead, additional sampling and analysis will be performed to assess this detection (See Section II.G6)

Total chromium was detected in groundwater samples collected from three groundwater monitoring wells: B-2, B-6, and B-8 (Exhibit II.G-4). Each of the detections were at or slightly above the method detection limit, and were less than the MCL of .05 mg/l for chromium. Samples collected from potable water wells indicate that chromium is present in concentrations less than the method detection limit, but these data were not collected from water-bearing intervals that are stratigraphically equivalent to the first water-bearing interval below the OB/OD Area. Literature (Dragun, 1988) indicates that the chromium concentration in groundwater is typically <1 to 5 ppb, which is below the concentration detected in the three OB/OD groundwater samples. However, other sources (Hem, 1985) suggest that in systems with adequate chromium source, sufficiently elevated pH (up to 9), and appropriate oxic/anoxic conditions, mobilization of up to 200 ppb total chromium within groundwater has occurred. Soil chemistry data for the water-bearing interval indicates that sediments within the water-bearing interval can contain up to 15 ppm total chromium. Thus, there are potential natural sources for chromium in groundwater in the OB/OD Area. The cadmium detection of 1004 mg/l is well below the .01 mg/l MCL for cadmium.

Additional groundwater sampling will be performed to assess the occurrence of barium, chromium, cadmium, and lead within groundwater. Details concerning proposed groundwater sampling are presented in Section II.G6 below.

II.G.5.a **<u>Indication of the Extent of the Plumes on the Topographic Map</u>:** 270.14(c)(4)(i), 264.600, 270.23; R315-3-6(a)(8), R315-8-16, R315-3-7(a)(4)(i)

Exhibit II.G-14 presents the locations and concentrations of lead, chromium, cadmium, and barium within OB/OD groundwater. Plume maps for each constituent were not constructed because of the questionable nature of the barium and chromium detections (not indicative of contamination) and the single lead detection, which cannot be contoured.

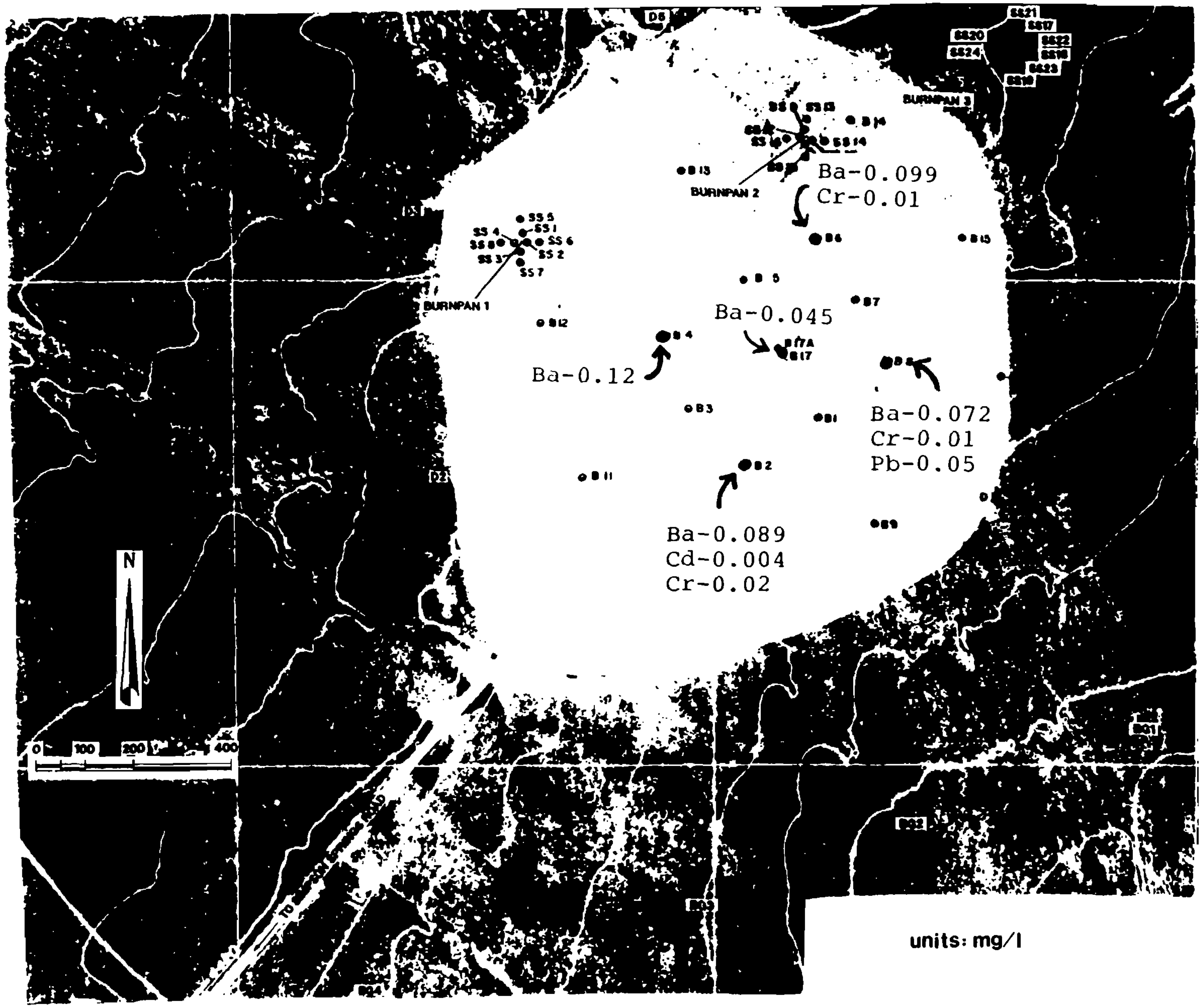
II.G.5.b **<u>Concentration of Pollutants in the Plume</u>:** 270.14(c)(4)(ii); R315-3-7(a)(4)(ii)

As shown in Exhibits II.G-3 and II.G-14, the concentrations of barium in groundwater ranges from 0.045 to 0.12 mg/l and chromium ranges from 0.01-0.02 mg/l, while the single lead detection was 0.05 mg/l. Cadmium concentration was .004 mg/l

II.G.6 **<u>Proposed Groundwater Monitoring Program</u>:** 270.14(c)(5), 264.97, 264.600, 270.23; R315-3-7(a)(5), R315-8-6.8, R315-8-16, R315-3-6(a)(8)

In discussions with State of Utah representatives, installation of two groundwater monitoring wells in the OB/OD Area was requested by the Agency to

Exhibit II.G-14: Groundwater Quality Data, OB/OD Area



assess local groundwater quality. Four groundwater monitoring wells were installed and sampled, more than that requested by the State. However, as discussed in Section II.G6.11, quality assurance data bring into question the representativeness of the groundwater quality sample data. Also, it is possible that some--if not all--of the constituents detected in groundwater are naturally occurring. Therefore, a second round of groundwater quality samples will be collected from Wells No. B-2, B-4, B-6, and B-8 and analyzed for arsenic, lead, total chromium, hexavalent chromium, barium, and cadmium (Exhibit II.G-15). Sample collection and analyses will follow procedures described in Appendix II.G-1. Groundwater quality will be evaluated based upon these new data, together with historic water quality information for the OB/OD Area and quality assurance/quality control data. Should data indicate that constituents are present in groundwater above the quantification limit and cannot be explained via the quality assurance data, installation of a background groundwater monitoring well upgradient of the OB/OD Area may be necessary. The well will be installed upgradient of the unit, with the specific location of the well to be determined based on upon groundwater sampling results. A Well Installation and Sampling Analysis Plan for the background well will be submitted prior to well installation.

Should background groundwater quality data indicate that constituents detected in groundwater below the OB/OD Area are not present upgradient, a detection monitoring system may be established. This may include installation of three additional groundwater monitoring wells downgradient of the unit, following methods presented in Appendix II.G-1. The locations of the three down-gradient groundwater monitoring wells (if required) will be determined in the future, and a detailed monitoring plan will be submitted at this time. If the wells are installed, they will be sampled quarterly for the first year, with statistical comparisons as designated in 40 CFR 264.97 performed to determine whether contaminant releases have occurred. Wells will be installed following methodologies described in Appendix II.G-1, and will be completed within the first water-bearing interval, approximately 90 to 95 feet below ground surface.

II.G.6.a **<u>Description of Well Design and Location</u>:** 264.97, 264.600, 270.23; R315-8-6.8, R315-8.16, R315-3-6(a)(8)

Because the proposed groundwater monitoring program includes sampling of existing groundwater monitoring wells, Sections II.G6.1-13 include information pertinent to the preexisting wells. The resampling event will follow procedures set forth in Sections II.G6.2 to 13, but with the modified analytical suite presented in Exhibit II.G-15. Should installation of additional groundwater monitoring wells be warranted, all new well information will be acquired in accordance with Sections II.G6.1-13 and Appendix II.G-1.

Within the area of the OB/OD Area, four groundwater monitoring wells have been installed, as shown in Exhibit II.G-2. Well construction details are provided in Exhibit II.G-3, and well installation details are presented in Appendix II.G-1. Initially, DPG had intended to install five deep soil borings in these locations, and collect one groundwater sample from within the auger flight when first water was encountered. However, because the depth to water was 90 feet, which was twice that anticipated, 4 of the 5 deep borings were completed as groundwater monitoring wells.

Appendix II.G-1 presents the well construction information for each of the five wells. As discussed above in Section II.G2, the wells are constructed of 2-inch PVC, Schedule 80, with 0.010-inch slotted well screen over the bottom 15 feet of each well. Annular space between the casing and boring was backfilled with #10-20 silica sand packed across the screened interval, with 5 feet of bentonite plug pellets installed above the sand pack. Approximately 70 feet of bentonite grout was tremied from the bentonite seal to ground surface, with a steel protective casing installed to protect the interior casing. The interior casing has a locking waterproof cap. Wells are

Exhibit II.G-15: Suggested Analytical Parameters and Methods for Round Two Groundwater Sampling, Monitoring Wells B2, B4, B6, and B8

Parameter	SW-846 Method
Arsenic	7060
Lead	7421
Total Chromium	6010
Hexavalent Chromium	7196
Barium	6010
Cadmium	6010

approximately 97 feet deep, and screened across a silty-sandy-clayey water-bearing zone.

II.G.6.b **Sample Collection Procedures**: 264.97(a)(1), 264.600, 270.23; R315-8-6.8(d)(1), R315-8-16, R315-3-6(a)(8)

Wells were allowed to stand undisturbed for over 24 hours after well completion to ensure solidification of grout. Each monitoring well was developed by fully evacuating the well, allowing it to then completely recharge, and then purged according to TEGD guidance. Disposable polyethylene, bottom-loaded bailers dedicated to each well were used for development, purging, and sampling. Groundwater samples were collected from the B-17 boring from inside the auger with a disposable polyethylene bailer. No development or purging of B-17 was performed.

Samples were collected in the bailers, with groundwater intended for metals analysis filtered utilizing 0.45 micron filters prior to emplacement in sample containers. Metals samples were preserved with nitric acid, all samples were placed in coolers with ice/coolant preservatives, and were labeled as described in Appendix II.G-1. Samples were kept on ice, then transported to the laboratory.

Each borehole was logged (Appendix II.G-1), and sediment samples were generally collected via split spoon sampler from approximately the 6"-1', 2'-4', 6'-8', 13'-15', and 25'-27' zones, as well as at the vadose-phreatic zone contact. For the single boring B-17 that was not completed as a monitoring well, samples were collected at each major lithologic change. Sample collection followed appropriate methodologies and quality assurance practices to ensure sample quality, as described in Appendix II.G-1.

II.G.6.c **Sample Preservation and Shipment**: 264.97(d)(2), 264.600, 270.23; R315-8-6.8(d)(2), R315-8-16, R315-3-6(a)(8)

Collected groundwater samples were placed upon ice (with appropriate absorbent material), with samples intended for metals analysis also preserved with nitric acid. Samples were shipped to American West Analytical Laboratory in Salt Lake City, Utah, the same day as sample collection.

II.G.6.d **Sampling and Analysis Procedures**: 264.97(d)(3), 264.600, 270.23; R315-8-6.8(d)(3), R315-8.16, R315-3-6(a)(8)

All soil boring and groundwater samples were collected using split spoon samplers and bailers as described above. Samples were analyzed for total metals, including arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver, as well as explosive residues such as TNT, DNT, HMX, and RDX. Of the soil and groundwater samples, 10% also were analyzed for volatile and semi-volatile organic materials. Exhibit II.G-4 presents the analyses performed, and number of samples collected which were analyzed for each parameter, while Appendix II.G-1 contains detailed analytical data.

II.G.6.e **Determination of the Groundwater Surface Elevation Each Time Groundwater is Sampled**: 270.23(e); R315-3-6(a)(8)(v)

During the sample collection effort for Wells No. B-2, B-4, B-6 and B-8, groundwater level (depth to groundwater) was measured using electronic water level detectors, with the groundwater surface elevation determined by subtracting the depth to water from the top of casing elevation (depth to water is measured from top of casing, and the casing top has been surveyed to determine elevation, as well as ground surface).

II.G.6.f **Vadose Zone Monitoring**: 270.23(e), 270.23(b)(2); R315-3-6(a)(8)(v)

Vadose zone monitoring relative to water infiltration rates, etc. has not been performed. However, surface soil sampling was accomplished, as described in Section II.B4.3 of this application.

II.G.6.g **Field Measurements**: 270.23(e); R315-3-6(a)(8)(v)

As indicated above, when each sample is collected the water level is determined. Additionally, field pH and specific conductance measurements are taken to ensure that proper purging of wells is performed, as well as to determine these parameters relative to the field sample collected for analysis.

II.G.6.h **Well Evacuation**: 270.23(e); R315-3-6(a)(8)(v)

Prior to sample collection, wells were purged using the dedicated bailers, to dryness, and allowed to fully recharge.

II.G.6.i **Sample Preparation**: 270.23(e); R315-3-6(a)(8)(v)

Groundwater samples to be analyzed for metals were preserved with nitric acid, and all samples were placed on ice prior to shipment to the designated laboratory. Samples intended for metals analysis were also filtered in the field using a .45 micron filter.

II.G.6.j **Analytical Procedures**: 270.23(e); R315-3-6(a)(8)(v)

Exhibit II.G-4 details the analytical procedures used to (analyze) groundwater samples collected. Exhibit II.G-15 also presents the analytical procedures for the resampling event.

II.G.6.k **QA/QC Procedures**: 270.23(e); R315-3-6(a)(8)(v)

The DPG Quality Assurance/Quality Control Program Plan, and a site-specific Quality Assurance Project Plan were followed throughout the sampling and analysis events as summarized in Appendix II.G-1. Quality control samples were collected and prepared for laboratory analysis, and included trip blanks, field blanks, and rinsate blanks. Trip blanks were prepared by placing deionized water in laboratory-prepared sample containers which were labeled, logged, and stored similarly to field collected samples. The trip blanks were transported to the field and carried with the sample containers/coolers throughout the day's sampling activities. Trip blanks are useful to determine whether transporting activities have compromised sample quality.

Field blanks were prepared in the field using deionized water, and are intended to determine whether activities associated with sample collection could have compromised sample integrity. Rinsate blanks were prepared by pouring deionized water over decontaminated sample equipment to ensure proper decontamination has occurred. Quality assurance sample analysis results are presented in Exhibit II.G-16. These data show that arsenic was detected in one trip blank, while barium was detected in four trip blanks. Origin of these contaminants is not known at this time. Barium was detected in six of the field and rinsate blanks, and cadmium and chromium were detected in one of the field blanks.

In addition to blanks, field duplicate samples, method blanks, and matrix spike/matrix spike duplicates were prepared. Field duplicate samples were collected to assess the precision of the analytical data, while method blanks are prepared to assess the potential for contamination during laboratory analysis. Matrix spikes are analyzed to calculate the accuracy and precision of a specific analytical method.

Exhibit II.G-16: Quality Assurance/Quality Control Sample Results (Kleinfelder, 1993)

TRIP BLANKS				
Sample Set (Lab #)	Date Submitted	Blank I.D. #	Analyte	Concentration (mg/l)
13991	May 5, 1993	DPG59301	Barium	0.004
14002	May 6, 1993	DPG59304	Barium	0.002
14504	June 21, 1993	DPG693S81	Barium	0.010
			Arsenic	0.008
14637	June 30, 1993	DPG62493S01	Barium	0.004

FIELD BLANKS				
Sample Set (Lab #)	Date Submitted	Blank I.D. #	Analyte	Concentration (mg/l)
13991	May 5, 1993	DPG59302	Barium	0.003
14002	May 6, 1993	DPG59305	Barium	0.004
14298	June 2, 1993	DPG593S55	Barium	0.003
14394	June 10, 1993	DPG59307	Barium	0.005
14504	June 21, 1993	DPG693587	Barium	0.003
14637	June 30, 1993	DPG62493S02	Barium	0.003
			Cadmium	0.005
			Chromium	0.01

RINSATE BLANKS				
Sample Set (Lab #)	Date Submitted	Blank I.D. #	Analyte	Concentration (mg/l)
13991	May 5, 1993	DPG59303	Barium	0.004
14002	May 6, 1993	DPG59306	Barium	0.006
14298	June 2, 1993	DPG593S56	Barium	0.005
14394	June 10, 1993	DPG59308	Barium	0.003
14504	June 21, 1993	DPGG93S90	Barium	0.003

Relative to groundwater, one duplicate sample was collected from B-17. Data indicate that the precision of sample collection was within 95% for barium, which was the only constituent detected in the B-17 groundwater duplicate sample. Method blank analysis indicated that barium was detected in two samples. Matrix spike/duplicate analysis indicated that the recoveries for RDX, five volatile compounds (benzene, chlorobenzene, 1,2 dichlorobenzene, toluene, and trichloroethane), and "various semi-volatile organic compounds" were "within the acceptable ranges for precision and accuracy" (Appendix II.G-1).

Data validation was performed relative to each of the samples collected. Results of the data validation did not indicate that any sample results were invalidated due to issues such as holding time. Appendix II.G-1 includes results of the data validation effort. Information validated included: activity dates; locations/descriptions of activities; chain-of-custody and field documentation; procedures; laboratory name; analytical method/extraction dates/holding times; detection limits; laboratory QA/QC; and Field QA/QC procedures.

II.G.6.l **Data Evaluation and Reporting**: 270.23(e); R315-3-6(a)(8)(v)

Appendix II.G-1 includes the data and analytical reports for all samples collected at the OB/OD Area. Exhibit II.G-4 summarizes the analytical suites for the first sampling event, and Exhibit II.G-4 also presents the analytical results for each sample collected during this event. As indicated above, American West Analytical Laboratory in Salt Lake City, Utah performed the analysis.

II.G.6.m **Chain-of-Custody Control**: 264.97(d)(4), 264.600, 270.23; R315-8-6.8(d)(4), R315-8-16, R315-3-6(a)(8)

Chain-of-custody forms for each sampling event are also included in Appendix II.G-1. As shown in this Appendix, Sample Control Logs were prepared which present the time, date, field sample number, sample location, sample matrix, number of containers, container type, preservatives, filtering, and notes for each sample collected. The Chain-of-Custody forms identify the date/time of sample collection, sample ID number, number of containers, and analysis to be performed, as well as appropriate remarks and signatures by everyone receiving/relinquishing sample possession. Samples collected were received by the analytical laboratory on the following day.

II.G.7 **Detection Monitoring Program Information**: 270.14(c)(6), 264.98, 264.600, 270.23; R315-3-7(a)(6), R315-8-16, R315-3-6(a)(8)

As discussed above, RCRA detection monitoring is not specifically required for Subpart X units if "the applicant can demonstrate that he does not violate the environmental performance standards of 40 CFR 264.601." In this case, "preliminary hydrologic, geologic, and meteorologic assessments will suffice." Because the preliminary groundwater quality data for the DPG OB/OD Area is inconclusive and additional information is required at this time, initiation of a detection monitoring program is premature pending results of well resampling and background groundwater quality determination (Section II.G6). Sampling procedures for the resampling effort and background groundwater monitoring well installation will be the same as those used during the previous sampling event, as discussed in Section II.G6.1-13. However, should data indicate that detection groundwater monitoring is necessary, a detection monitoring program will be initiated as described under Section II.G6.1 and a detailed Sampling and Analysis Plan will be submitted at this time. It is anticipated that the detection monitoring program will follow the installation, sampling and analysis procedures described within this application unless otherwise mandated by resampling/background results.

II.G.7.a **Indicator Parameters**: 270.14(c)(6)(i), 264.600, 270.23; R315-3-7(a)(6)(i), R315-8-16, R315-3-6(a)(8)

Specific indicator parameters cannot be determined at this time, but may be equivalent to those listed in Exhibit II.G-15. Concentration of these parameters shall be compared with background groundwater constituent concentrations utilizing the appropriate statistical analysis under detection monitoring, if warranted. Because groundwater quality data do not indicate that organics or explosive materials are present within groundwater, analyses for these parameters are not included in the second round of sampling, and would likely not be included in a future detection monitoring program.

II.G.7.b **Hazardous Constituents**: 270.14(c)(6)(ii), 264.600, 270.23; R315-3-7(a)(6)(i), R315-8-16, R315-3-6(a)(8)

As indicated above, the anticipated hazardous constituents required for detection monitoring are presented in Exhibit II.G-15.

II.G.7.c **A Proposed Groundwater Monitoring System**: 270.14(c)(6)(ii), 264.600, 270.23; R315-3-7(a)(6)(ii), R315-8-16, R315-3-6(a)(8)

The proposed groundwater monitoring system will be presented in a detailed Sampling and Analysis Plan, should initiation of a detection monitoring program be warranted based on resampling and background groundwater quality results.

II.G.7.d **Background Values for Each Proposed Monitoring Parameter of Constituent**: 270.14(c)(6)(iii), 264.600, 270.23; R315-3-7(a)(6)(iii), R315-8-16, R315-3-6(a)(8)

Background groundwater quality data specific to the OB/OD is currently not available. Installation of a background groundwater quality well may be required (see Section II.G6 for discussion) and background groundwater quality data would be submitted when available.

II.G.7.e **Description of Proposed Sampling, Analysis, and Statistical Comparison Procedures**: 270.14(c)(6)(iv), 264.600, 270.23; R315-3-7(a)(6)(iv), R315-8-16, R315-3-6(a)(8)

Sampling and analysis has been performed in accordance with the procedures described in Appendix II.G-1. Any future detection monitoring program sampling will likely follow the same procedures. A detailed Sampling and Analysis Plan for the detection monitoring program will be submitted to the State for review if such a program is necessary. To summarize, each monitoring well will be purged to dryness and allowed to recover. Samples will be collected using disposable polyethylene bottom loading bailers; samples intended for metals analysis will be filtered prior to collection within a polyethylene container, and shall be preserved with nitric acid. Sample containers will be labeled, logged, and stored in accordance with Appendix B, and will be sent to an approved laboratory with the appropriate chain of custody protocols. At least one of the groundwater samples will be collected in duplicate (10-20% of total sample number), and samples will be collected quarterly. Analytical suite for detection monitoring cannot be determined completely based on available data, but will likely include select TCLP metals and Appendix VIII organics.

After four consecutive quarterly samples from all wells have been collected and analyzed, these data will be statistically evaluated relative to background groundwater quality following procedures described in 40 CFR 264.97(h) and 264.98(f). These procedures will be "appropriate for the distribution of chemical parameters or hazardous constituents" detected. These analyses will determine whether there is statistically significant evidence of contamination for any chemical parameter or hazardous constituent specified in the permit.

II.G.8 <u>Recordkeeping of Groundwater Analytical Data</u>: 264.98(c) and (g); R315-8-6.9(c) and (g)

All data will be recorded in the format(s) presented in Appendix II.G-1. This information will be transferred to the Agencies within the requisite biannual report.

II.G.9 <u>Compliance Monitoring Program</u>: 270.14(c)(7), 264.99; R315-3-7(a)(7), R315-8-6.10

A compliance monitoring program is not required for the OB/OD Area at this time. If the results of the proposed additional groundwater monitoring and the detection monitoring program indicate that hazardous constituents have been detected in the groundwater at point of compliance, then a plan for a compliance monitoring program will be developed and submitted to the State of Utah.

II.G.10 <u>Corrective Action Program</u>: 270.14(c)(8), 264.100; R315-3-7(a)(8), R315-8-6.11

A corrective action program is not required for the OB/OD Area at this time. If the results of the detection monitoring program or the compliance monitoring program indicate that hazardous constituents have been detected in the groundwater at point of compliance which exceed concentration limits established under 40 CFR 264.94, Table 1, a corrective action program will be developed and submitted to the State of Utah.

APPENDIX II.G-1

SOIL AND GROUNDWATER INVESTIGATION
OPEN BURN/OPEN DETONATION SITE
DUGWAY PROVING GROUND, UTAH

Kleinfelder, Inc., 1983

KLEINFELDER

SOIL AND GROUNDWATER INVESTIGATION
Open Burn/Open Detonation Site
Dugway Proving Ground, Utah

August 6, 1993

(C:\JC\Dug-8-28)

Prepared For:

U.S. Army Dugway Proving Ground
ATTN: STEDP-EN-F-I
Dugway, Utah 84022-5000

Kleinfelder File No. 30-2025-14.001
30-2025-15.001
30-2025-18.001

Soil & Groundwater Investigation
Open Burn/Open Detonation Site
North of Simpsons Spring Road
Dugway Proving Ground, Utah

Contract No. DACA05-92-D-0005, BP11, BP13, and BP16

Prepared by:

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2749 E. Parley's Way, Suite 100
Salt Lake City, UT 84109

August 6, 1993

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APPENDICES

1.0 EXECUTIVE SUMMARY

The U.S. Army Dugway Proving Ground (DPG) retained Kleinfelder to investigate soil and groundwater at the open burn/open detonation (OB/OD) site north of Simpson Spring Road according to the sampling program prepared by A. T. Kerney. The sampling program was written to comply with State of Utah recommendations for the Subpart X submittal amending DPG's RCRA Part B permit.

Kleinfelder sampled the surface at 33 locations, drilled 12 shallow soil borings and five deep borings to groundwater according to workplans and modifications to workplans. Monitoring wells were constructed in four of the deep borings. Soil and groundwater samples were submitted to American West Analytical Laboratories to be analyzed for the presence of the eight RCRA-listed priority pollutant metals and explosive residues including HMX, RDX, TNT and DNT. Selected samples were also analyzed for volatile organic compounds and semi-volatile organic compounds.

Analytical data indicate that surface soils around two burn bans (the west and middle pans) contain low levels of explosive residues, primarily DNT. Elevated lead concentrations, up to 740 mg/kg, were detected in surface soils around the middle burn pan.

Relatively low concentrations of tentatively identified (non-target) semivolatile organic compounds were reported in soil samples from borings B-6 and B-8.

Other soils investigated in the OB/OD area and in surface drainages around the OB/OD do not appear to have been impacted by operations at the OB/OD area. Groundwater does not appear to have been impacted by metals or explosive residues. This summary of results is subject to the limitations described in Section 6.

2.0 INTRODUCTION

2.1 General

Kleinfelder Inc., was retained by U.S. Army Dugway Proving Ground to provide environmental engineering services associated with collecting data for revisions to the Subpart X permit application which is being prepared by A.T. Kearney, Inc. for the open burn/open detonation (OB/OD) area.

The OB/OD area, located approximately three miles south of the Carr Facility at Dugway Proving Ground (Plate 1), consists of a circular area approximately 1200 feet across utilized for the detonation of unexploded munitions and ordinances (Plate 2). In the northern part of the OB/OD area, there are three "burn pans" which are used to destroy flammable material.

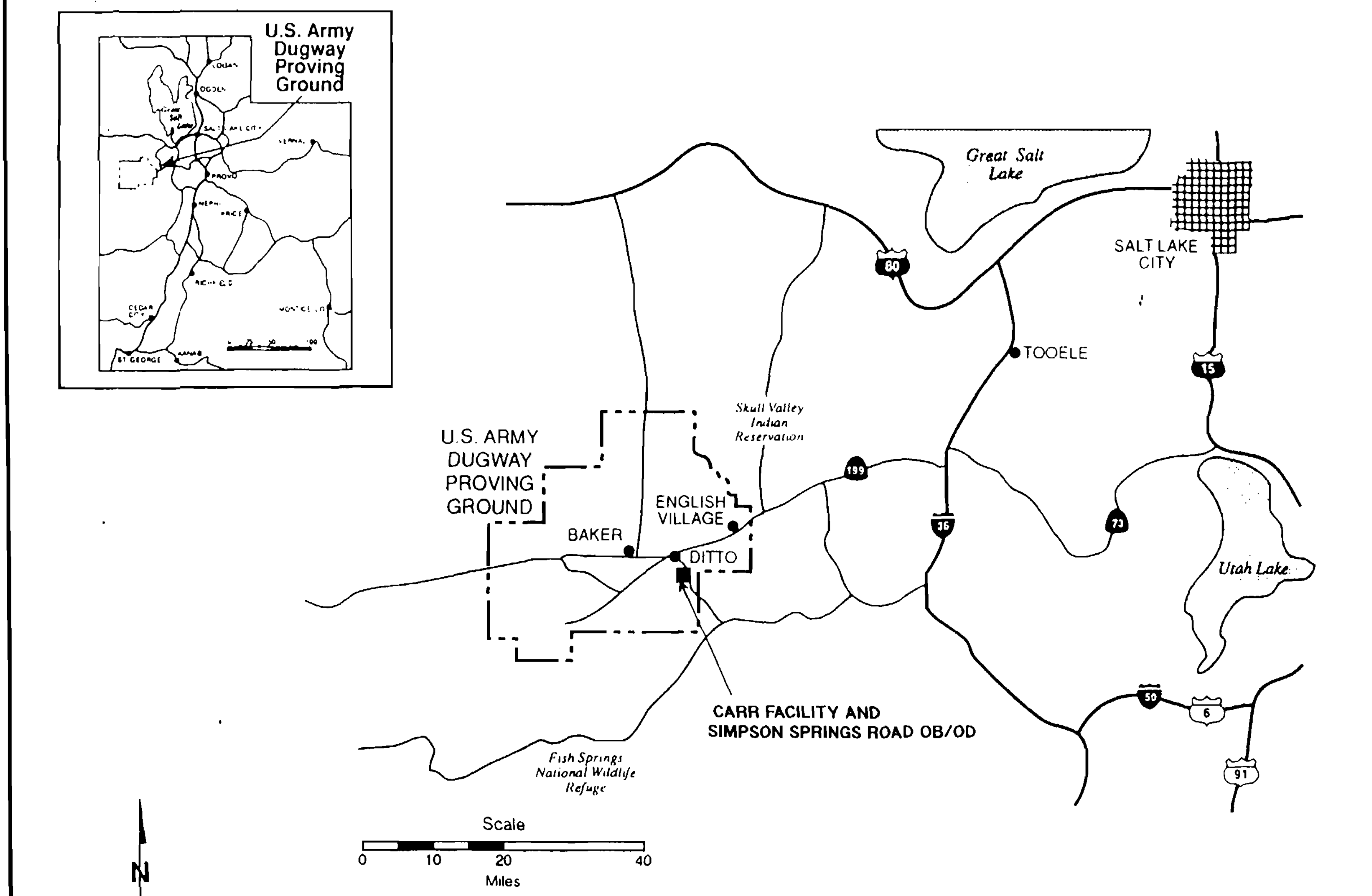
2.2 Scope of Work

The scope of services, based on the work plan prepared by A.T. Kearney, includes collecting samples from the following areas:

- Open Burn/Open Detonation Area - Soil and Groundwater Samples
- Burn Pan Areas - Surface Soil Samples
- Surface Drainages (leading into and away from the OB/OD area) - Surface Soil
- Background Areas (outside the OB/OD area) - Composite Soil (0-5 feet)

The samples collected during the investigation were to be analyzed for explosive residues (HMX, RDX, DNT and TNT by EPA Method 8330) and metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Approximately 10% of the samples were also to be analyzed for volatile and semivolatile organic compounds (EPA Methods 8240 and 8270).

During the original scoping, groundwater was expected to be less than 70 feet below ground surface. Water samples were to be bailed from five borings rather than from wells to provide screening-level analyses. However, during drilling, the first boring encountered water at 95 feet below ground surface. The scope was then modified to



KLEINFELDER

REGIONAL MAP OF THE U.S. ARMY DUGWAY PROVING GROUND

PLATE 1

Project Number 30-2025-14, 15, & 18

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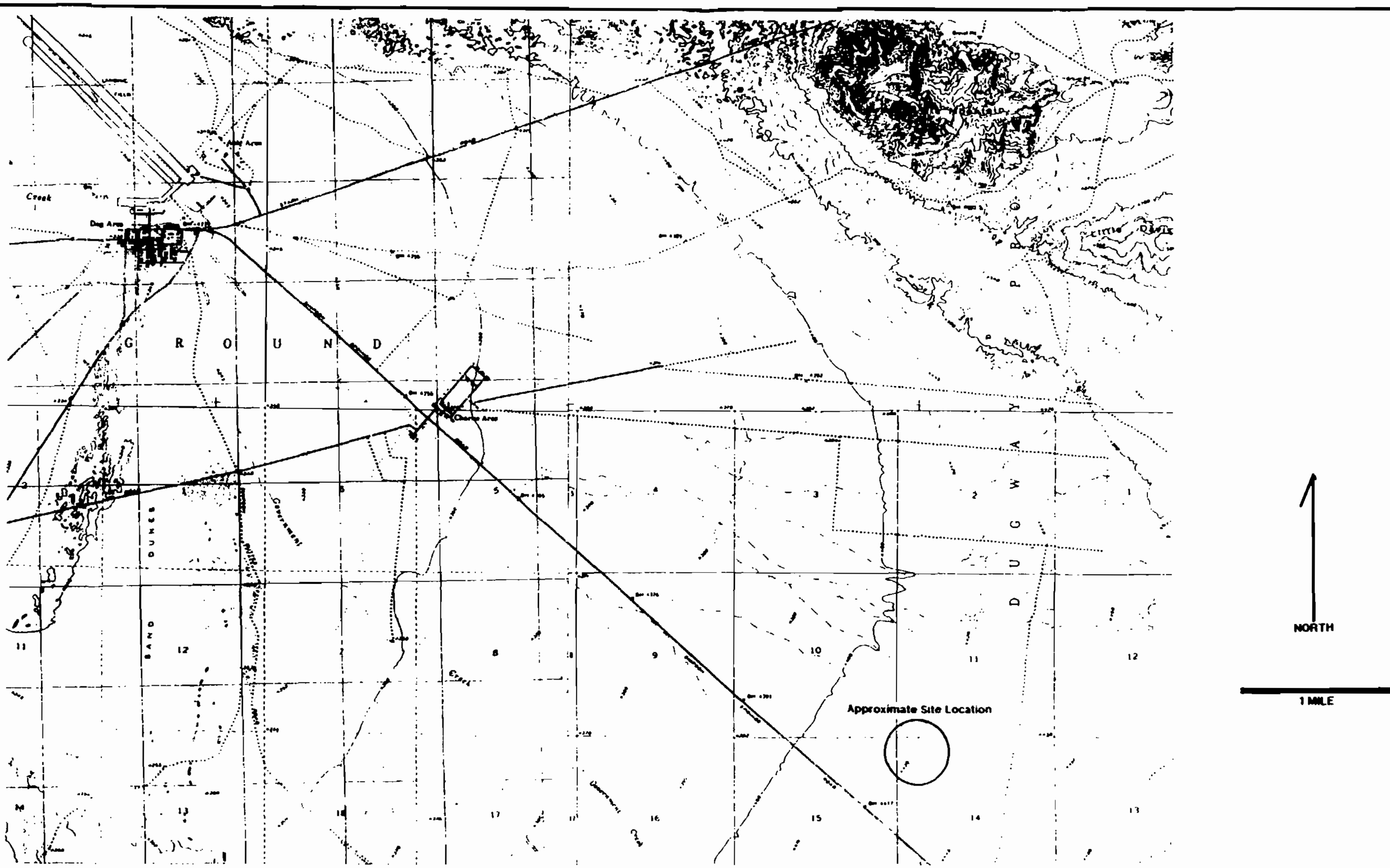


KLEINFELDER

PROJECT NO. 30-2025-14, 15, & 18

VICINITY MAP OF THE SIMPSON SPRINGS ROAD OB/OD

Camel's Back Ridge NW and
Camel's Back Ridge NE 7.5" Quads

PLATE
2

M-7

include the installation of two-inch monitor wells in the remaining four borings at the OB/OD to allow future groundwater samples to be collected from the aquifer.

3.0 FIELD ACTIVITIES

The sampling program prepared by A.T. Kearney, Inc. specified sampling locations, depths, and chemical analyses to be performed. The sampling protocol and the decontamination protocol were developed through discussions between Kleinfelder and Dugway Proving Ground personnel.

3.1 Soil Sampling

Surface soils (0 to 1 foot depth) were sampled in the following locations to assess potential impact of activities associated with the OB/OD Area on the surface:

- OB/OD Area (B-1 through B-17)
- Burn Pans (SS-1 through SS-24)
- Surface Drainages into and away from OB/OD Area (D-1 through D-5)
- Background area outside OB/OD area (BG-1 through BG-4)*

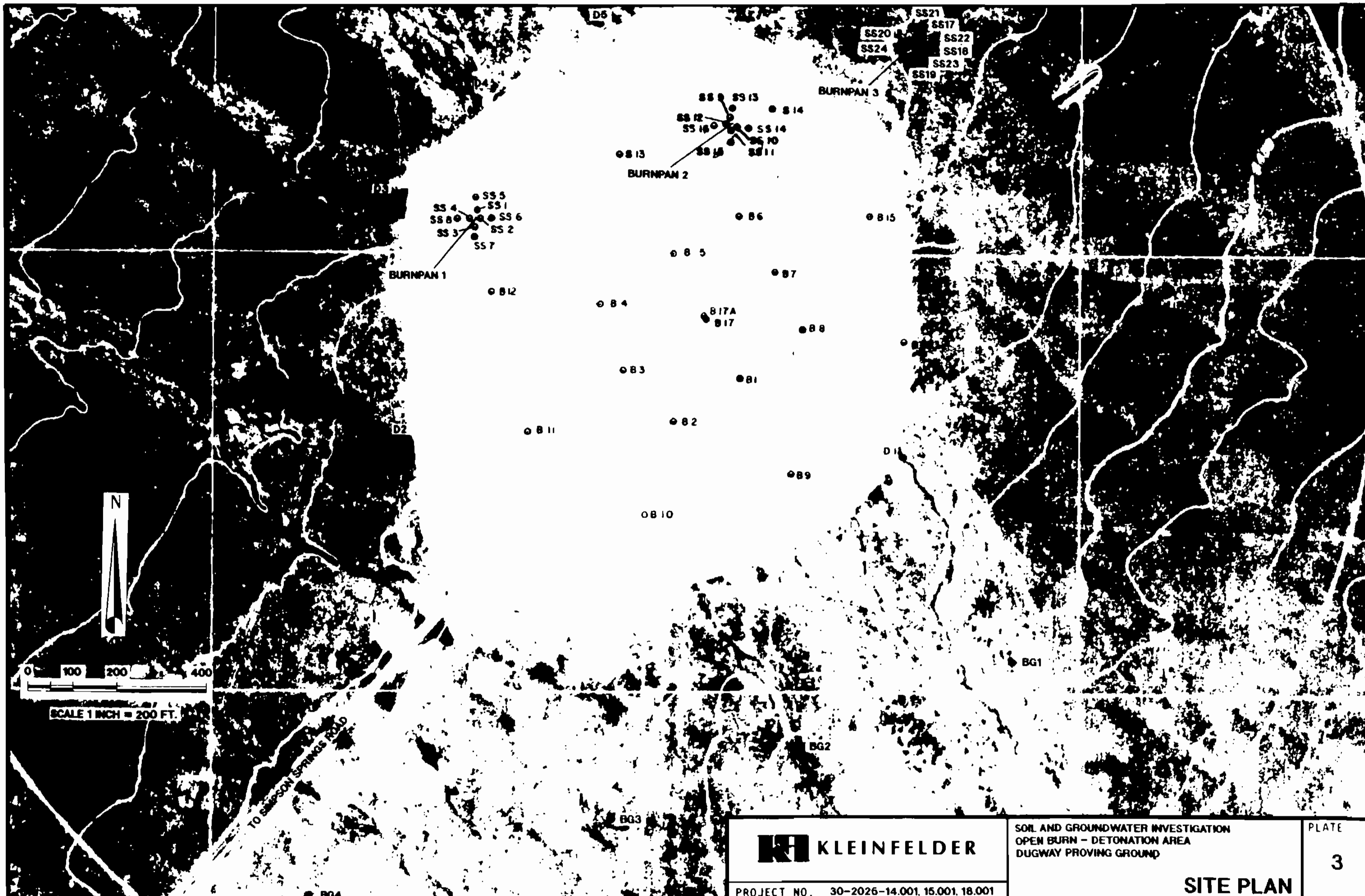
Subsurface soils (> 1 foot depth) in the following locations were sampled to assess the potential impact to subsurface strata by activities associated with the OB/OD Area:

- OB/OD Area (B-1 through B-17)
- Background area outside OB/OD Area (BG-1 through BG-4)*

Five of the borings (B-2, B-4, B-6, B-8, B-17) were sampled to 97 feet below ground surface. The remaining borings were sampled at a depth of 5 feet below ground surface.

Generally, samples were collected at the locations specified by the A.T. Kearney workplan. Sample locations were staked by DPG personnel and are identified on the site map provided by AAA Engineering and Drafting (Plate 3).

* Samples from BG-1 through BG-4 were collected at 0.5 and 5 feet and composited into one sample from each location prior to analysis.



KLEINFELDER

SOIL AND GROUNDWATER INVESTIGATION
OPEN BURN – DETONATION AREA
DUGWAY PROVING GROUND

PLATE 3

SITE PLAN

PROJECT NO. 30-2026-14.001, 15.001, 18.001

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The samples were issued unique sample I.D. numbers and logged on sample control logs for sample description and documentation purposes. Labels on each sample included the sample I.D. number, the date and time of collection, the job number, the sampler's name, and the sample preservation method used (if any).

The samples were labeled, stored, transported and remitted to an independent EPA-certified analytical laboratory, American West Analytical Laboratories, in Salt Lake City, Utah, according to standard chain-of-custody protocol. A list of the samples collected, including sample location, sample depth, date, sample identification number, and laboratory sample set number, is presented on Table 1.

3.1.1 Surface Soil Sampling Protocol

Surface samples were collected after vegetation and the top 1 to 2 inches of soil were scraped away using a clean stainless steel trowel. A sample from between 2 inches and 6 inches below the general surface elevation was then collected using another clean stainless steel trowel and placed directly into laboratory-prepared, Teflon™ capped sample jars. At locations where drilling equipment was used, six-inch stainless steel sample tubes were mechanically pushed into the soil after the top two inches had been removed. The ends of the sampler tubes were covered with Teflon™ sheets and capped with durable plastic end-caps. The sample containers were sealed, labeled, logged, and transported as described in Section 3.1. Field sample logs and chain-of-custodies are included in Appendix A.

3.1.2 Hand Augering Protocol

At select sample locations where proposed depth of subsurface sampling was less than 5 feet below the surface, samples were collected using hand augering techniques. The decontaminated stainless steel hand auger was manually advanced into the subsurface and soil samples were retrieved desired depths. The soil samples collected in the hand auger "bucket" were carefully transferred to laboratory-prepared Teflon™ capped sample jars, or were collected in stainless steel sample rings. Samples were collected while forcing the rings into the "undisturbed" soil housed in the bucket, carefully avoiding the edges of the auger bucket. The sample containers were sealed, labeled, logged and stored as described in Section 3.1. Field sample logs and chain-of-custodies are included in Appendix A.

TABLE 1
SAMPLE IDENTIFICATION LOG
SOIL AND GROUNDWATER SAMPLES
OB/OD AREA, DUGWAY PROVING GROUND

Sample Location	General Location Description	North Coordinate (feet)	East Coordinate (feet)	Ground Elevation (feet)	Sample Depth (feet)	Date Sampled	Sample I.D. No.	Sample Matrix	Lab. Sample Set #	Analysis Required A:Metals B:Explosives C:Organics
B-1	OB/OD Area	7220373.2	1267462.8	4423.6	0.5-1.0	05/03/93	DPG593S01	Soil	13991	A, B
					3.5-4.0	05/03/93	DPG593S02	Soil	13991	A, B
					7.5-8.0	05/03/93	DPG593S03	Soil	-	Not Analyzed
					14.5-15.0	05/03/93	DPG593S04	Soil	-	Not Analyzed
					27.5-28.0	05/03/93	DPG593S05	Soil	-	Not Analyzed
B-2	OB/OD Area	7220282.4	1267310.4	4423.6	0.5-1.0	06/03/93	DPG693S60	Soil	14335	A, B
					3.5-4.0	06/03/93	DPG693S61	Soil	14335	A, B
					7.5-8.0	06/03/93	DPG693S62	Soil	14335	A, B
					14.5-15.0	06/03/93	DPG693S63	Soil	14335	A, B
					27.5-28.0	06/04/93	DPG693S66	Soil	14359	A, B
					96.5-97.0	06/04/93	DPG693S70	Soil	14359	A, B
					-	06/28/93	DPG62893S03	Water	14637	A, B
B-3	OB/OD Area	7220397.6	1267192.7	4422.3	0.5-1.0	05/05/93	DPG593S11	Soil	14002	A, B
					0.5-1.0	05/05/93	DPG593S13	Soil	14002	A, B
					4.5-5.0	05/05/93	DPG593S12	Soil	14002	A, B
B-4	OB/OD Area	7220552.4	1267141.9	4421.4	0.5-1.0	05/27/93	DPG593S50	Soil	14298	A, B
					3.5-4.0	05/27/93	DPG593S51	Soil	14298	A, B
					7.5-8.0	05/27/93	DPG593S52	Soil	14298	A, B
					14.5-15.0	05/27/93	DPG593S53	Soil	14298	A, B
					26.5-27.0	05/27/93	DPG593S54	Soil	14298	A, B
					96.5-97.0	06/02/93	DPG693S58	Soil	14335	A, B
					-	06/04/93	DPG693S67	Water	14359	A, B
B-5	OB/OD Area	7220663.3	1267315.3	4421.7	0.5-1.0	05/05/93	DPG593S14	Soil	14002	A, B, C
					4.5-5.0	05/05/93	DPG593S15	Soil	14002	A, B
B-6	OB/OD Area	7220748.8	1267468.9	4421.6	0.5-1.0	06/18/93	DPG693S82	Soil	14504	A, B, C
					3.5-4.0	06/18/93	DPG693S83	Soil	14504	A, B
					7.5-8.0	06/18/93	DPG693S84	Soil	14504	A, B
					14.0-14.5	06/18/93	DPG693S85	Soil	14504	A, B
					14.5-15.0	06/18/93	DPG693S86	Soil	14504	C
					26.0-26.5	06/18/93	DPG693S88	Soil	14504	A, B
					26.5-27.0	06/18/93	DPG693S89	Soil	-	Not Analyzed
					96.5-97.0	06/19/93	DPG693S91	Soil	14504	A, B
					-	06/28/93	DPG62893S05	Water	14637	A, B

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TABLE 1 (Continued – page 2 of 4)

Sample Location	General Location Description	North Coordinate (feet)	East Coordinate (feet)	Ground Elevation (feet)	Sample Depth (feet)	Date Sampled	Sample I.D. No.	Sample Matrix	Lab. Sample Set #	Analysis Required A:Metals B:Explosives C:Organics
B-7	OB/OD Area	7220615.0	1267551.8	4422.5	0.5-1.0	05/05/93	DPG593S16	Soil	14002	A, B
					4.5-5.0	05/05/93	DPG593S17	Soil	14002	A, B
B-8	OB/OD Area	7220484.5	1267610.4	4423.4	0.5-1.0	06/08/93	DPG693S72	Soil	14368	A, B, C
					0.5-1.0	06/08/93	DPG693S73	Soil	14368	A, B, C
					3.5-4.0	06/08/93	DPG693S74	Soil	14368	A, B
					7.5-8.0	06/08/93	DPG693S75	Soil	14368	A, B
					14.5-15.0	06/08/93	DPG693S76	Soil	14368	A, B
					26.5-27.0	06/08/93	DPG693S77	Soil	14368	A, B
					96.5-97.0	06/10/93	DPG693S80	Soil	14504	A, B
					–	06/28/93	DPG62893S04	Water	14637	A, B
B-9	OB/OD Area	7220151.1	1267574.4	4425.1	0.5-1.0	05/05/93	DPG593S18	Soil	14002	A, B
					4.5-5.0	05/05/93	DPG593S19	Soil	14002	A, B
B-10	OB/OD Area	7220069.0	1267238.0	4423.8	0.5-1.0	05/05/93	DPG593S20	Soil	14002	A, B
					4.5-5.0	05/05/93	DPG593S21	Soil	14002	A, B
B-11	OB/OD Area	7220264.4	1266972.1	4421.3	0.5-1.0	05/06/93	DPG593S22	Soil	14394	A, B
					4.5-5.0	05/06/93	DPG593S23	Soil	14394	A, B
B-12	OB/OD Area	7220587.7	1266890.2	4419.0	0.5-1.0	05/06/93	DPG593S24	Soil	14394	A, B
					0.5-1.0	05/06/93	DPG593S25	Soil	14394	A, B
					4.5-5.0	05/06/93	DPG593S26	Soil	14394	A, B
B-13	OB/OD Area	7220894.6	1267198.9	4420.0	0.5-1.0	05/18/93	DPG593S30	Soil	14141	A, B
					4.5-5.0	05/18/93	DPG593S31	Soil	14141	A, B
B-14	OB/OD Area	7220990.7	1267550.1	4420.5	0.5-1.0	05/17/93	DPG593S27	Soil	14141	A, B
					4.0-4.5	05/17/93	DPG593S28	Soil	14141	A, B
B-15	OB/OD Area	7220746.8	1267771.3	4422.3	0.5-1.0	05/18/93	DPG593S32	Soil	14141	A, B
					4.5-5.0	05/18/93	DPG593S33	Soil	14141	A, B
B-16	OB/OD Area	7220452.4	1267845.7	4424.7	0.5-1.0	05/18/93	DPG593S34	Soil	14141	A, B
					4.5-5.0	05/18/93	DPG593S35	Soil	14141	A, B
B-17	OB/OD Area	7220516.0	1267389.3	4422.5	0.5-1.0	05/18/93	DPG593S36	Soil	14141	A, B
					3.5-4.0	05/18/93	DPG593S37	Soil	14141	A, B
					7.5-8.0	05/18/93	DPG593S38	Soil	14141	A, B
					13.0-14.5	05/18/93	DPG593S39	Soil	14141	A, B
					25.0-26.5	05/18/93	DPG593S40	Soil	14141	A, B
					96.5-97.0	05/26/93	DPG593S44	Soil	14247	A,B, Nitroglyc.
					–	05/26/93	DPG593S47	Water	14247	A,B,C,Nitroglyc
					–	05/26/93	DPG593S48	Water	14247	A,B,C,Nitroglyc

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TABLE 1 (Continued – page 3 of 4)

Sample Location	General Location Description	North Coordinate (feet)	East Coordinate (feet)	Ground Elevation (feet)	Sample Depth (feet)	Date Sampled	Sample I.D. No.	Sample Matrix	Lab. Sample Set #	Analysis Required A:Metals B:Explosives C:Organics
SS-01	West Burn Pan(#1)	7220776.9	1266860.1	4418.6	0.5	05/04/93	DPG593SS01	Soil	13991	A, B
SS-02	West Burn Pan(#1)	7220753.7	1266870.2	4419.7	0.5	05/04/93	DPG593SS02	Soil	13991	A, B, C
SS-03	West Burn Pan(#1)	7220737.0	1266856.3	4418.8	0.5	05/04/93	DPG593SS03	Soil	13991	A, B
SS-04	West Burn Pan(#1)	7220756.0	1266841.8	4418.4	0.5	05/04/93	DPG593SS04	Soil	13991	A, B
SS-05	West Burn Pan(#1)	7220801.1	1266859.0	4418.6	0.5	05/04/93	DPG593SS05	Soil	13991	A, B
SS-06	West Burn Pan(#1)	7220752.4	1266895.0	4418.9	0.5	05/04/93	DPG593SS06	Soil	13991	A, B
SS-07	West Burn Pan(#1)	7220712.2	1266855.8	4418.6	0.5	05/04/93	DPG593SS07	Soil	13991	A, B
SS-08	West Burn Pan(#1)	7220757.8	1266817.3	4418.2	0.5	05/04/93	DPG593SS08	Soil	13991	A, B
SS-09	Middle Pan (#2)	7220970.8	1267452.6	4420.2	0.5	05/04/93	DPG593SS09	Soil	13991	A, B
SS-10	Middle Pan (#2)	7220950.9	1267469.7	4420.3	0.5	05/04/93	DPG593SS10	Soil	13991	A, B
SS-11	Middle Pan (#2)	7220940.9	1267453.9	4420.5	0.5	05/04/93	DPG593SS11	Soil	13991	A, B
SS-12	Middle Pan (#2)	7220957.1	1267443.3	4420.2	0.5	05/04/93	DPG593SS12	Soil	13991	A, B
							DPG593SS25	Soil	13991	A, B
SS-13	Middle Pan (#2)	7220996.7	1267459.7	4420.2	0.5	05/04/93	DPG593SS13	Soil	13991	A, B
SS-14	Middle Pan (#2)	7220946.1	1267494.1	4420.5	0.5	05/04/93	DPG593SS14	Soil	13991	A, B
SS-15	Middle Pan (#2)	7220916.8	1267450.6	4420.6	0.5	05/04/93	DPG593SS15	Soil	13991	A, B
SS-16	Middle Pan (#2)	7220956.9	1267416.9	4420.3	0.5	05/04/93	DPG593SS16	Soil	13991	A, B
SS-17	East Burn Pan(#3)	7221157.7	1267885.3	4422.1	0.5	05/04/93	DPG593SS17	Soil	13991	A, B, C
SS-18	East Burn Pan(#3)	7221142.3	1267904.0	4422.7	0.5	05/04/93	DPG593SS18	Soil	13991	A, B
SS-19	East Burn Pan(#3)	7221122.1	1267886.0	4422.9	0.5	05/04/93	DPG593SS19	Soil	13991	A, B
SS-20	East Burn Pan(#3)	7221131.6	1267862.7	4422.6	0.5	05/04/93	DPG593SS20	Soil	13991	A, B
						05/04/93	DPG593SS26	Soil	13991	A, B
SS-21	East Burn Pan(#3)	7221178.9	1267873.8	4422.3	0.5	05/04/93	DPG593SS21	Soil	13991	A, B
SS-22	East Burn Pan(#3)	7221148.1	1267928.6	4423.2	0.5	05/04/93	DPG593SS22	Soil	13991	A, B
SS-23	East Burn Pan(#3)	7221101.7	1267899.9	4423.1	0.5	05/04/93	DPG593SS23	Soil	13991	A, B
SS-24	East Burn Pan(#3)	7221122.5	1267841.1	4422.7	0.5	05/04/93	DPG593SS24	Soil	13991	A, B
D-1	Drainage (East)	7220188.1	1267839.7	4425.4	0.5	05/05/93	DPG593SS27	Soil	14002	A, B
D-2	Drainage (West)	7220241.8	1266650.3	4418.5	0.5	05/05/93	DPG593SS32	Soil	14002	A, B
D-3	Drainage (West)	7220794.2	1266626.9	4416	0.5	05/05/93	DPG593SS29	Soil	14002	A, B
D-4	Drainage (West)	7221041.4	1266838.2	4417.7	0.5	05/05/93	DPG593SS28	Soil	14002	A, B
D-5	Drainage (West)	7221216.2	1267117.9	4417.6	0.5	05/05/93	DPG593SS30	Soil	14002	A, B, C
					0.5	05/05/93	DPG593SS31	Soil	14002	A, B
BG-1	Background	7219715.2	1268072.1	4429	0.5&5.0	05/04/93	DPG593S06	Soil	13991	A, B
BG-2	Background	7219532.7	1267588.7	4428.3	0.5&5.0	05/04/93	DPG593S07	Soil	13991	A, B
BG-3	Background	7219380.0	1267148.4	4424.3	0.5&5.0	05/04/93	DPG593S08	Soil	13991	A, B
BG-4	Background	7219215.6	1266446.9	4421.3	0.5&5.0	05/05/93	DPG593S09	Soil	14002	A, B, C
					0.5&5.0	05/05/93	DPG593S10	Soil	14002	A, B, C

TABLE 1 (Continued – page 4 of 4)

Sample *Location*	General Location *Description*	North Coordinate *(feet)*	East Coordinate *(feet)*	Ground Elevation *(feet)*	Sample Depth *(feet)*	Date *Sampled*	Sample *I.D. No.*	Sample *Matrix*	Lab. Sample *Set #*	Analysis Required A:Metals B:Explosives *C:Organics*
	Trip Blank				–	05/03/93	DPG59301	Water	13991	A, B
	Trip Blank				–	05/05/93	DPG59304	Water	14002	A, B
	Trip Blank				–	05/18/93	DPG593S29	Water	14141	A, B
	Trip Blank				–	05/24/93	DPG593S43	Water	14247	A, B, Nitroglyc.
	Trip Blank				–	05/27/93	DPG593S49	Water	14298	A, B
	Trip Blank				–	06/01/93	DPG593S57	Water	14335	A, B
	Trip Blank				–	06/04/93	DPG693S65	Water	14359	A, B
	Trip Blank				–	06/08/93	DPG693S71	Water	14368	A, B
	Trip Blank				–	06/18/93	DPG693S81	Water	14504	A, B
	Trip Blank				–	06/24/93	DPG62493S01	Water	14637	A, B
	Field Blank				–	05/03/93	DPG59302	Water	13991	A, B
	Field Blank				–	05/05/93	DPG59305	Water	14002	A, B
	Field Blank				–	05/06/93	DPG59307	Water	14394	A, B
	Field Blank				–	05/18/93	DPG593S41	Water	14141	A, B
	Field Blank				–	05/26/93	DPG593S45	Water	14247	A, B, Nitroglyc.
	Field Blank				–	05/27/93	DPG593S55	Water	14298	A, B
	Field Blank				–	06/03/93	DPG593S64	Water	14335	A, B
	Field Blank				–	06/04/93	DPG693S68	Water	14359	A, B
	Field Blank				–	06/08/93	DPG693S78	Water	14368	A, B
	Field Blank				–	06/18/93	DPG693S87	Water	14504	A, B
	Field Blank				–	06/28/93	DPG62893S02	Water	14637	A, B
	Rinsate Blank				–	05/03/93	DPG59303	Water	13991	A, B
	Rinsate Blank				–	05/05/93	DPG59306	Water	14002	A, B
	Rinsate Blank				–	05/06/93	DPG59308	Water	14394	A, B
	Rinsate Blank				–	05/18/93	DPG593S42	Water	14141	A, B
	Rinsate Blank				–	05/26/93	DPG593S46	Water	14247	A, B, Nitroglyc.
	Rinsate Blank				–	05/27/93	DPG593S56	Water	14298	A, B
	Rinsate Blank				–	06/03/93	DPG593S59	Water	14335	A, B
	Rinsate Blank				–	06/04/93	DPG693S69	Water	14359	A, B
	Rinsate Blank				–	06/08/93	DPG693S79	Water	14368	A, B
	Rinsate Blank				–	06/18/93	DPG693S90	Water	14504	A, B
									14637	

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3.1.3 Soil Boring Protocol

A truck-mounted drilling rig was used at sample locations which required deeper subsurface sampling. Standard hollow-stem auger techniques were used to advance borings to desired sample depths. Split spoon samplers, equipped with stainless steel sample rings, were advanced at the sample depths using standard ASTM penetration methods. The sampler was then retrieved and opened by Kleinfelder personnel and each sample ring capped with Teflon™ sheets which were in turn covered with durable plastic end caps. Again, the samples were sealed, labeled, logged and stored as described in Section 3. Field sample logs and chain-of-custodies are included in Appendix A.

Boring logs are presented in Appendix B of this document. Boring logs include a description of the lithology, sample locations, field screening results, monitor well details and other data pertinent to describing the conditions encountered at each location.

3.2 Groundwater Sampling

The original scope of work required groundwater to be sampled from inside the augers while drilling the five deep borings. The scope was, however, modified after drilling and sampling the first boring to include the installation of monitor wells from which valid and repeatable groundwater data could be collected.

3.2.1 Monitor Well Installation

At four soil boring locations (B-2, B-4, B-6 and B-8) which were drilled to a depth at which the shallow unconfined aquifer was intercepted (97 feet), 2-inch schedule 80 polyvinylchloride (PVC) monitor wells were installed. The bottom 15 feet of each well casing was constructed with 0.010-inch slotted well screen. The annulus between the well screen and the inside of the boring was backfilled with #10-20 clean silica sand. The annulus above the sand pack was sealed with five feet of bentonite, in the form of pellets. The annulus above the bentonite pellets around the well casing was then backfilled with bentonite grout to the surface. Each well was capped with a 2-inch waterproof locking cap. A steel cover set in a 4' x 4' x 8" concrete pad was installed around each well head for additional protection.

3.2.2 Groundwater Sampling Protocol

Each monitor well was fully developed, allowed to fully recharge, and purged according to EPA Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Technical Enforcement Guidance Document (TEGD) and the 1991 revision of SW846. Development, purging and sampling were accomplished using disposable, polyethylene, bottom-loading bailers to reduce the possibility of cross-contamination.

Water samples also were collected from B-17 by bailing a sample from inside the auger with a disposable polyethylene bailer. No development or purging was performed prior to collecting this sample.

Groundwater samples collected in the disposable bailers were placed in laboratory-prepared containers, labeled, logged and stored as described in Section 3.1. Groundwater samples collected to be analyzed for the presence of metals were filtered using disposable 0.45 micron filters prior to being placed in sample containers. Field sample logs and chain-of-custodies are included in Appendix A.

3.3 Decontamination Protocol

The decontamination protocol was developed through discussions between Kleinfelder and Dugway Proving Ground personnel based on the RCRA TEGD. All sampling equipment which was not dedicated and which may contact laboratory samples was decontaminated before use, between each sample, and at the completion of the sampling program. This was accomplished by one of two methods depending on the equipment to be decontaminated.

Drilling equipment, including augers, bits, center rod sand tools, were cleaned using a high-pressure, high-temperature steam cleaner. All wash water generated during the process was collected in a large stainless steel tank located in the designated decontamination area which was isolated from all sampling activities. Wash water was transferred from the container to 55 gallon drums for storage. The storage drums are discussed later in this section.

Sample equipment including hand augers, hand shovels, split spoon samplers and hand tools were decontaminated by performing a series of washes and rinses. Initially the equipment was scrubbed in a non-phosphate, tap water solution followed by a rinse of de-ionized water. The equipment was then rinsed with methanol, deionized water, and nitric acid. Finally, each piece of equipment was triple rinsed with deionized water and allowed to air dry. The procedure took place in a designated decontamination area which was isolated from all sampling activities. All liquid generated by this procedure was transferred from 5 gallon collection containers to 55 gallon drums for storage.

All liquid generated during decontamination was transferred to 55 gallon drums. The drums were labeled with the following information:

- Generation Date
- Drum Contents
- Approximate Volume Stored
- DPG Contact (Mr. Martin Pendley)

A total of 28 drums containing decontamination liquids were transported to a storage area on the OB/OD access road near Simpson's Spring Road, as requested by Mr. Martin Pendley.

3.4 Sample Quality Control

Kleinfelder field personnel prepared the following quality control samples for laboratory analysis:

- Trip Blanks
- Field Blanks
- Rinsate Blanks

Trip blanks were prepared by placing de-ionized water in laboratory-prepared sample containers at Kleinfelder's office. The samples were labeled, logged and stored similarly to field collected samples. The samples were transported to the field where they were joined by field-collected samples. Trip blanks were prepared to assess whether activities associated with transporting samples, may have caused samples to be contaminated.

Field blanks were collected similarly to the trip blanks, however, the samples were prepared in the field where environmental samples were being collected to assess whether activities associated with collecting samples may have caused contamination.

Rinsate blanks were prepared by pouring deionized water over decontaminated sample equipment, and collecting the rinsate in laboratory-prepared containers. Samples were labeled, logged and stored according to standard sample handling procedures. The purpose of rinsate blanks is to assess the effectiveness of decontaminating procedures of the sampling equipment.

4.0 RESULTS

4.1 Background Soil Concentrations

Background soil metals and explosives concentrations were measured at four locations: BG-1, BG-2, BG-3, and BG-4. These four locations are 1,000 to 1,500 feet south of the approximate middle of the OB/OD area (Plate 3). Soil samples were collected at depths of 0.5 and 5.0 feet, and were composited into one sample for analysis from each location. A duplicate sample was collected from BG-4.

No explosive residues (DNT, HMX, RDX, TNT) were detected at concentrations exceeding reporting limits in the samples from BG-1 through BG-4. Reporting limits in mg/kg are as follows: DNT - 0.25, HMX - 2.2, RDX - 1.0, TNT - 0.25.

Of the eight metals measured, two (mercury and selenium) were not detected at concentrations exceeding the reporting limit of 0.1 mg/kg in the samples from BG-1 through BG-4. The analytical results are summarized on Table 2. Background ranges for the remaining six metals are estimated by calculating the average concentration, plus or minus two standard deviations, for each metal. This results in the following ranges.

Analyte	Background Range (Sample Mean ± 2 Std. Dev.)
Arsenic	4.4 - 8.0
Barium	116 - 212
Cadmium	2.2 - 4.2
Chromium	9 - 15
Lead	5 - 15
Mercury	<0.1
Selenium	<0.1
Silver	<0.5 - 2.3

Since laboratory recoveries for these analytes generally range from 80% to 120%, these background ranges can be further adjusted by 20% in each direction in order to provide

TABLE 2
ANALYTICAL RESULTS – BACKGROUND SOIL SAMPLES
METALS CONCENTRATIONS
OB/OD AREA, DUGWAY PROVING GROUND

Sample Location	North Coordinate (feet)	East Coordinate (feet)	Sample Depth (feet)	Sample ID No.	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
BG-1	7219715.2	1268072.1	0.5&5.0	DPG593S06	7.0	150	3.4	11	7.8	<0.1	<0.1	1.3
BG-2	7219532.7	1267588.7	0.5&5.0	DPG593S07	7.3	150	3.1	10	8.8	<0.1	<0.1	1.6
BG-3	7219380.0	1267148.4	0.5&5.0	DPG593S08	5.9	140	3.8	12	9.4	<0.1	<0.1	1.4
BG-4	7219215.6	1266446.9	0.5&5.0	DPG593S09	5.3	190	2.4	11	12	<0.1	<0.1	<0.5
				DPG593S10	5.4	190	3.1	14	14	<0.1	<0.1	0.7
				Maximum	7.3	190	3.8	14	14	None	None	1.6
				Minimum	5.3	140	2.4	10	7.8	Detected	Detected	0
				Average (Avg.)	6.2	164	3.2	12	10.4			1.1
				Standard Dev. (S)	0.9	24	0.5	1.5	2.5			0.6
				Range (Avg +/- 2S)	4.4-8	116-212	2.2-4.2	9-15	5-15	<0.1	<0.1	<0.5-2.3
				Range +/- 20%	3.5-9.6	93-254	1.8-5.0	7-18	4-18	<.1-.12	<.1-.12	<0.5-2.8

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a basis of comparison with laboratory results for individual samples. These ranges are as follows:

Analyte	Adjusted Background Range (Background Range + 20%)
Arsenic	3.5 - 9.6
Barium	93 - 254
Cadmium	1.8 - 5.0
Chromium	7 - 18
Lead	4 - 18
Mercury	<.1 - 0.12
Selenium	<.1 - 0.12
Silver	<.5 - 2.8

The ranges developed above should be somewhat representative of natural soil conditions in the shallow soils in the OB/OD area, and provide a starting point for assessing whether other samples have been affected by activity at the OB/OD. However, lateral variations in soil type may cause samples from some areas in the OB/OD to fall outside of these ranges. Results that fall outside of these ranges should be studied in more detail to assess significance in terms of potential impacts.

4.2 Surface Drainages

Soil samples were collected from five surface drainages that could carry runoff onto or away from the OB/OD. Sample location D-1 is on the "upstream" (southeast) side of the OB/OD, while D-2, D-3, D-4 and D-5 are on the west and northwest side of the OB/OD in drainages that leave the area (Plate 3).

No explosive residues (DNT, HMX, RDX, TNT) were detected at concentrations exceeding reporting limits in the samples from D-1 through D-5. Reporting limits in mg/kg are as follows: DNT - 0.25, HMX - 2.2, RDX - 1.0, TNT - 0.25.

Of the eight metals analyzed, three (mercury, selenium, and silver) were not detected at concentrations exceeding reporting limits of 0.1, 0.1 and 0.5 mg/kg, respectively. The analytical results are summarized in Table 3. The reported concentrations of the remaining five metals (arsenic, barium, cadmium, chromium, and lead) are below or within the background ranges derived in Section 4.1, with the exception of lead in

TABLE 3
ANALYTICAL RESULTS – SURFACE DRAINAGE SOIL SAMPLES
METALS CONCENTRATIONS
OB/OD AREA, DUGWAY PROVING GROUND

Sample Location	North Coordinate (feet)	East Coordinate (feet)	Sample Depth (feet)	Sample ID No.	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
D-1	7220188.1	1267839.7	0.5	DPG593SS27	3.3	170	1.9	9.8	13	<0.1	<0.1	<0.5
D-2	7220241.8	1266650.3	0.5	DPG593SS32	5.0	240	3.2	15	22	<0.1	<0.1	<0.5
D-3	7220794.2	1266626.9	0.5	DPG593SS29	4.0	180	2.4	12	12	<0.1	<0.1	<0.5
D-4	7221041.4	1266838.2	0.5	DPG593SS28	2.8	160	1.1	7.1	10	<0.1	<0.1	<0.5
D-5	7221216.2	1267117.9	0.5	DPG593SS30	3.5	170	1.5	8.8	18	<0.1	<0.1	<0.5
				DPG593SS31	3.7	190	2.2	11	14	<0.1	<0.1	<0.5

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DD-2. The laboratory reported 22 mg/kg lead in this sample, 4 mg/kg (approximately 17%) higher than the upper end of the background range.

4.3 Burn Pans

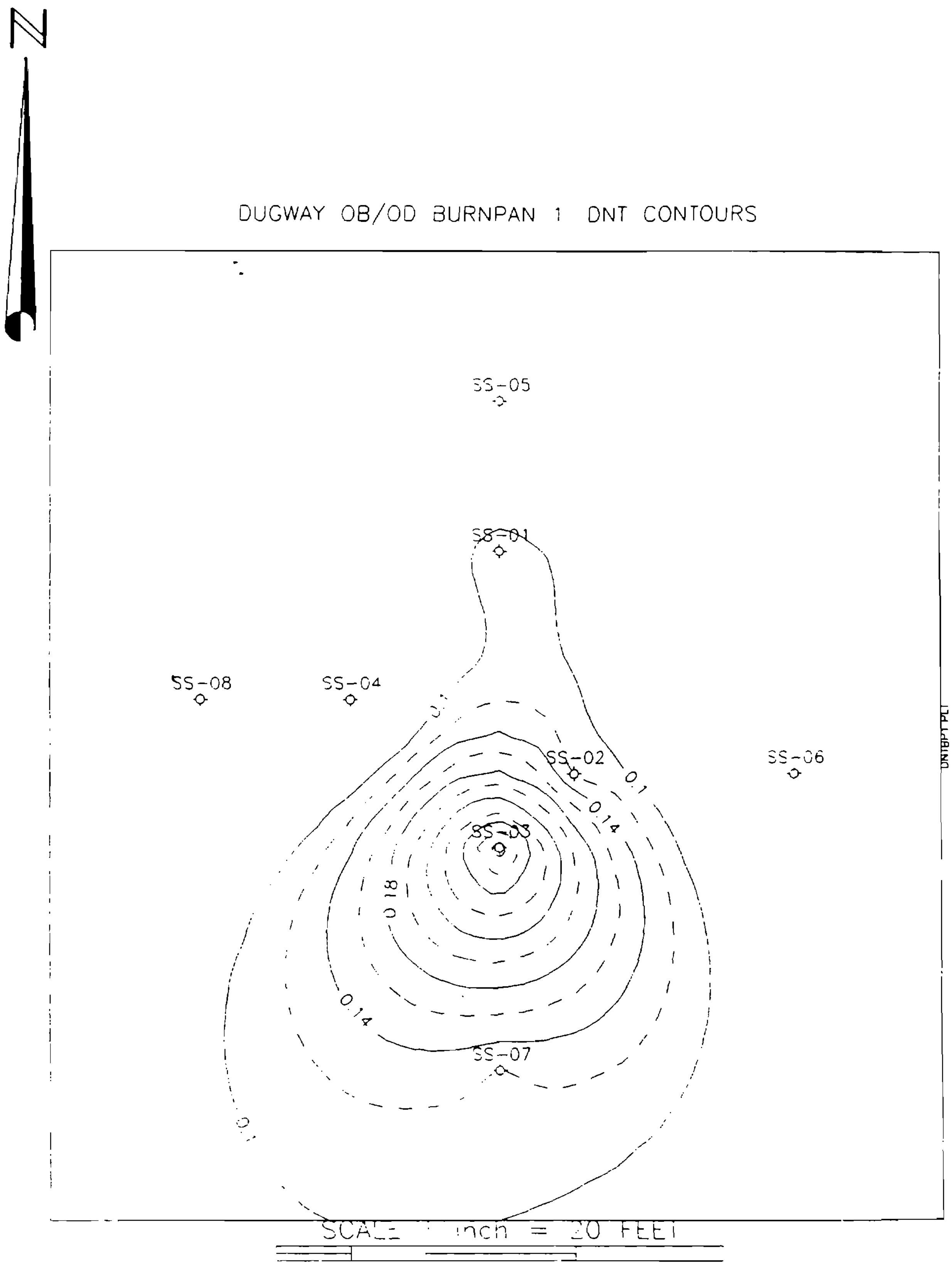
Eight samples were collected around each of three burn pans located in the northern part of the OB/OD area. Locations SS-1 through SS-8 are located around the west pan (Burn Pan 1); locations SS-9 through SS-16 are located around the center pan (Burn Pan 2); and locations SS-17 through SS-24 are located around the east pan (Burn Pan 3). The locations are shown on Plate 3. The samples were collected from 0.5 feet below ground surface for analysis of explosives (DNT, HMX, TDX, and TNT) and metals. Two samples, from SS-2 and SS-17, were also analyzed for volatile and semi-volatile organic compounds. Duplicate samples were collected from SS-12 and SS-20 to assess measurement precision.

Burn Pan #1 (West Pan)

DNT was detected in four of the eight samples from around Burn Pan #1; SS-1, SS-2, SS-3 and SS-7. In three of these samples (SS-1, SS-2, and SS-7) the amount detected was less than the practical quantitation limit of 0.25 mg/kg. In SS-3, the laboratory reported 0.31 mg/kg DNT. No other explosive residue (HMX, RDX, TNT) were detected in the eight samples. The DNT results are contoured on Plate 4 (using one half the quantitation limit of 0.12 mg/kg for the traces, and 0.0 for the samples where DNT was not detected).

No volatile or semi-volatile organic compounds were detected in the sample from SS-2 at concentrations exceeding reporting limits. The reporting limits for volatile compounds are 0.040 mg/kg, except 1,2-dichlorobenzene, which has a reporting limit of 0.10 mg/kg. The reporting limits for semi-volatile compounds range from 0.5 to 50 mg/kg, depending on the analyte. Additionally, the laboratory did not report the presence of tentatively identified compounds in the sample from SS-2.

Metals concentrations reported in the samples from SS-1, SS-2, SS-4, SS-5, and SS-6 are within the background ranges derived in Section 4.1 except for 24 mg/kg lead in



KLEINFELDER

SOIL AND GROUNDWATER INVESTIGATION
OPEN BURN/OPEN DETONATION AREA
DUGWAY PROVING GROUND

BURNPAN 1
DNT CONCENTRATIONS (ppm)

PLATE 4

PROJECT NO. 30-2025-14, 15 AND 18

SS-5. The sample from SS-3 slightly exceeds the background ranges for barium, cadmium, chromium, lead, and silver, as follows:

Analyte	Concentration in SS-3 (mg/kg)	Calculated Background Range (mg/kg)
Barium	300	93 - 254
Cadmium	7.4	1.8 - 5.0
Chromium	22	7 - 18
Lead	29	4 - 18
Silver	3.6	<.5 - 2.8

Burn Pan #2 (Middle Pan)

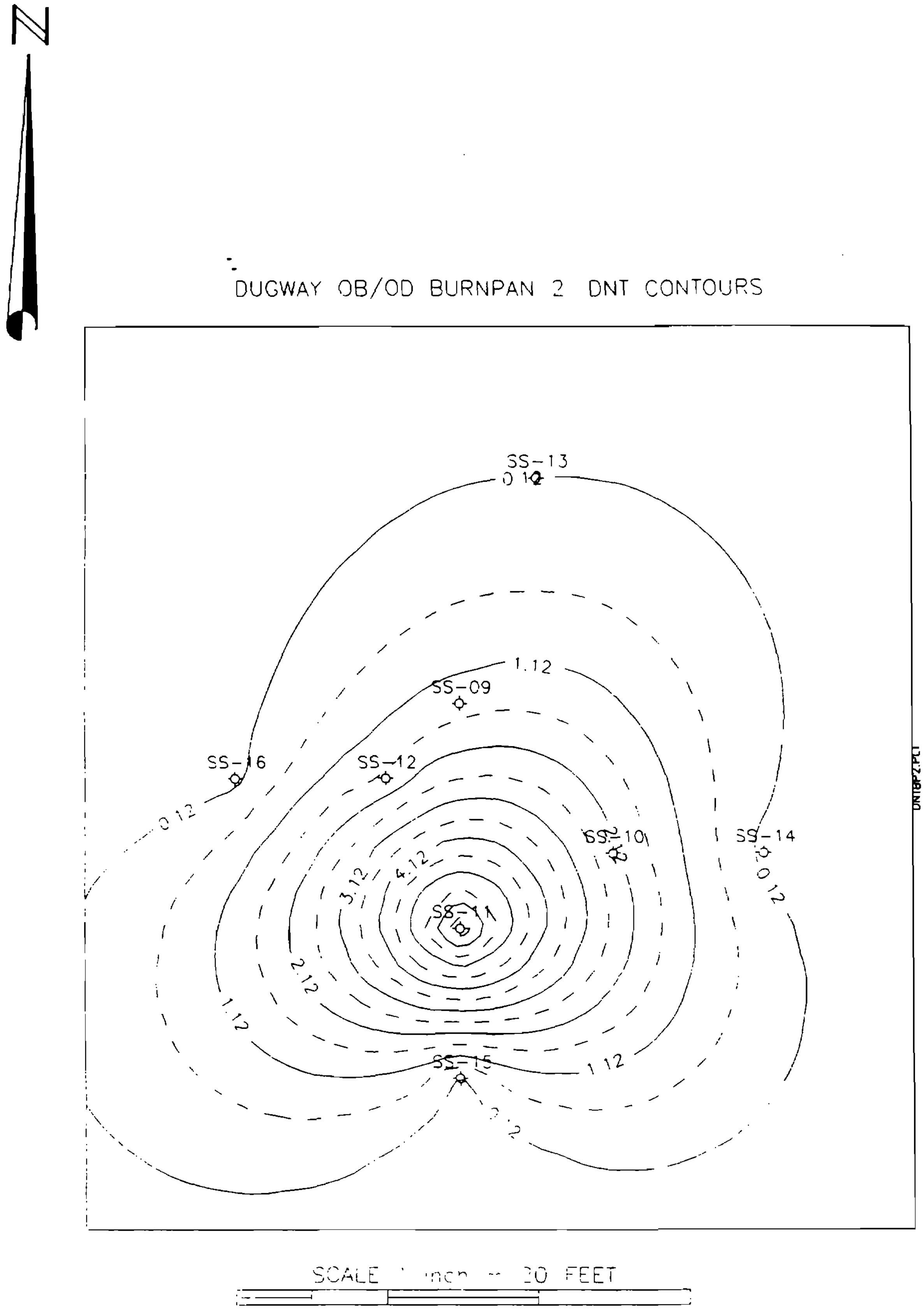
Explosive residues (DNT, RDX, and TNT) were reported in six of the eight samples from around Burn Pan #2, as follows:

Location	DNT (mg/kg)	RDX (mg/kg)	TNT (mg/kg)
SS-9	1.4	Trace*	ND**
SS-10	2.2	ND	ND
SS-11	7.0	ND	1.3
SS-12	1.7	ND	ND
SS-13	Trace	Trace	ND
SS-15	Trace	ND	ND
Reporting Limits	*0.25*	*1.0*	*0.25*

No HMX was detected in the eight samples at concentrations exceeding the reporting limit of 2.2 mg/kg. The DNT results are contoured in Plate 5, using one of half the reporting limit for "trace" results and zero for non-detect (ND) results.

Metals concentrations reported in the eight samples are within the calculated background ranges except for lead. Lead exceeds the upper background concentrations

* Trace = Detected at concentrations below reporting limits.
** ND = Not detected above reporting limits.



SCALE 1 inch = 20 FEET

KLEINFELDER

PROJECT NO. 30-2025-14, 15 AND 18

SOIL AND GROUNDWATER INVESTIGATION
OPEN BURN/OPEN DETONATION AREA
DUGWAY PROVING GROUND

BURNPAN 2
DNT CONCENTRATIONS (ppm)

PLATE
5

of 18 mg/kg in four locations, and slightly exceeds background in one of the duplicate samples from a fifth location. These lead results are presented below.

Site	Lead Concentration (mg/kg)	
SS-9	25	
SS-10	740	
SS-11	250	
SS-13	68	
SS-12 duplicate	19	(Primary sample result = 14)

The lead results are contoured on Plate 6.

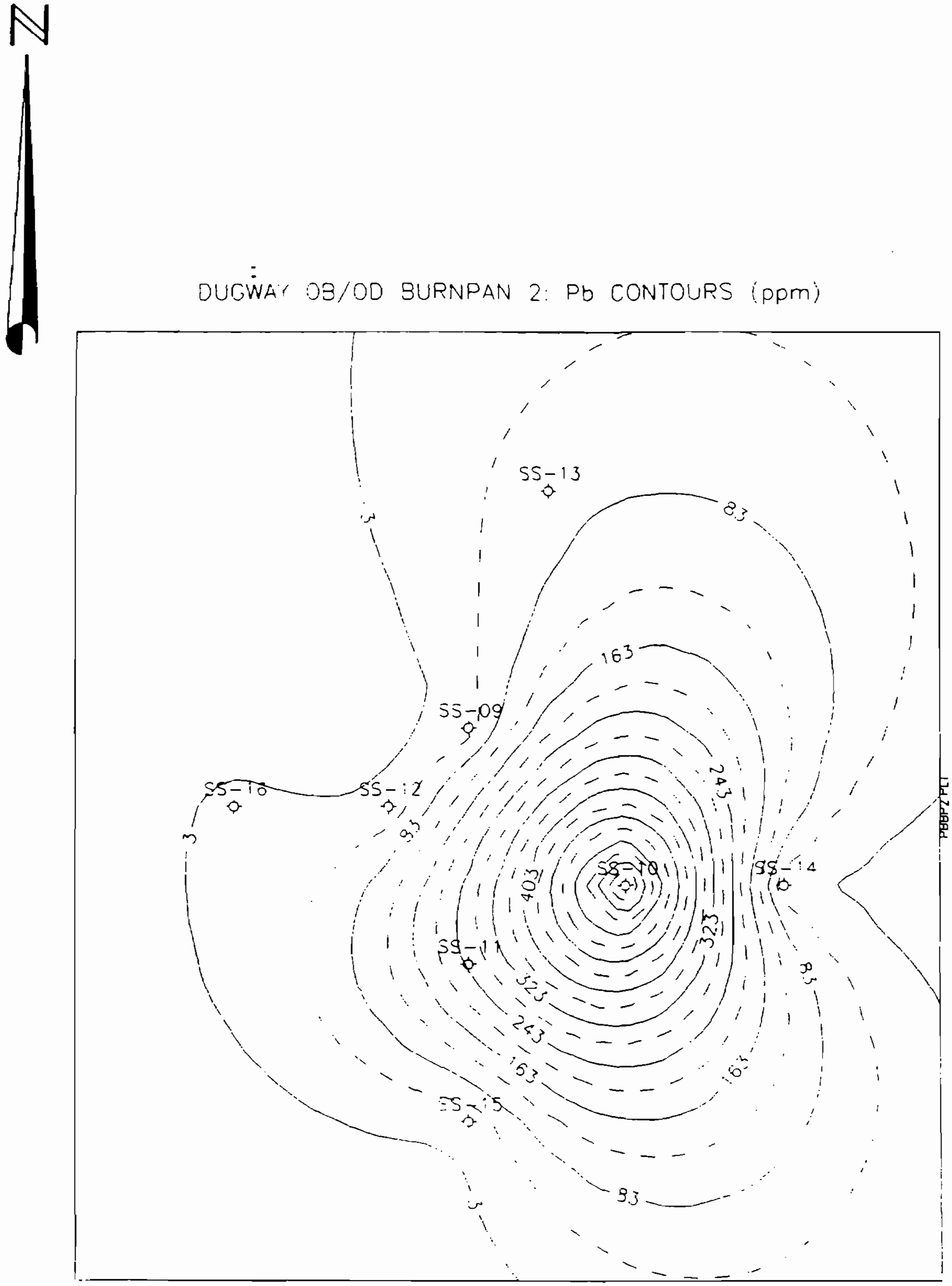
Burn Pan #3 (East Plan)

No explosive residues (DNT, HMX, RDX, TNT) were detected at concentrations exceeding reporting limits in the samples from Burn Pan #3 (SS-17 through SS-24). Reporting limits in mg/kg are as follows: DNT - 0.25, HMX - 2.2, RDX - 1.0, TNT - 0.25.

No volatile or semivolatile organic compounds were detected at concentrations exceeding reporting limits in the sample from SS-17. The reporting limit for volatile organic compounds is 0.04 mg/kg, except for 1, 2-dichlorobenzene which has a reporting limit of a 10 mg/kg. Reporting limits for semivolatile organic compounds vary from 0.5 to 50 mg/kg, depending on the analyte. Additionally, the laboratory did not report the presence of tentatively identified compounds in the sample from SS-17.

Metals concentrations detected in samples from around Burn Pan 3 (SS-17 through SS-24) were within the background ranges derived in Section 4.1 for all metals except arsenic. Arsenic concentrations in these samples ranged from 2.0 to 3.3 mg/kg, lower than the background range of 2.5 to 9.6 mg/kg.

DUGWAY OB/OD BURNPAN 2: Pb CONTOURS (ppm)



SCALE 1 inch = 20 FEET

KLEINFELDER

PROJECT NO. 30-2025-14, 15 AND 18

SOIL AND GROUNDWATER INVESTIGATION
OPEN BURN/OPEN DETONATION AREA
DUGWAY PROVING GROUND

BURNPAN 2
LEAD CONCENTRATIONS (ppm)

PLATE 6

4.4 OB/OD Geology and Hydrology

Five borings (B-2, B-4, B-6, B-8 and B-17) were drilled to approximately 97 feet below ground surface. Locations of these borings are shown on Plate 3. Boring logs are included in Appendix B.

Based on these five borings, it appears that the OB/OD area is underlain by clay and silty clay from the ground surface to an approximate depth of 22 feet. Coarser-grained soils (silty sands, silty gravels, sands, and sandy gravels) were encountered from a depth of 22 feet to approximately 65 - 75 feet below ground surface. A 10- to 20-foot thick zone of silt and clay was encountered within the zone of sands and gravels in all borings except B-2, at depths ranging from approximately 30 to 40 feet below ground surface. The coarse-grained soils are underlain by clay from an approximate depth of 62 to 78 feet below ground surface to the bottom of the boring. The clay in B-17 and B-8 contains 2 to 10 feet of coarser soil (silty sand, silty gravel) between 70 and 80 feet below ground surface. A 2-foot silty sand layer was encountered at 96 feet below ground surface in B-2, B-4 and B-17.

Groundwater was encountered in each boring at a depth of approximately 95 feet below ground surface. The groundwater level in each boring then rose to a static level of about 87 feet below ground surface, indicating that groundwater in the area is at least partially confined below or within the clay.

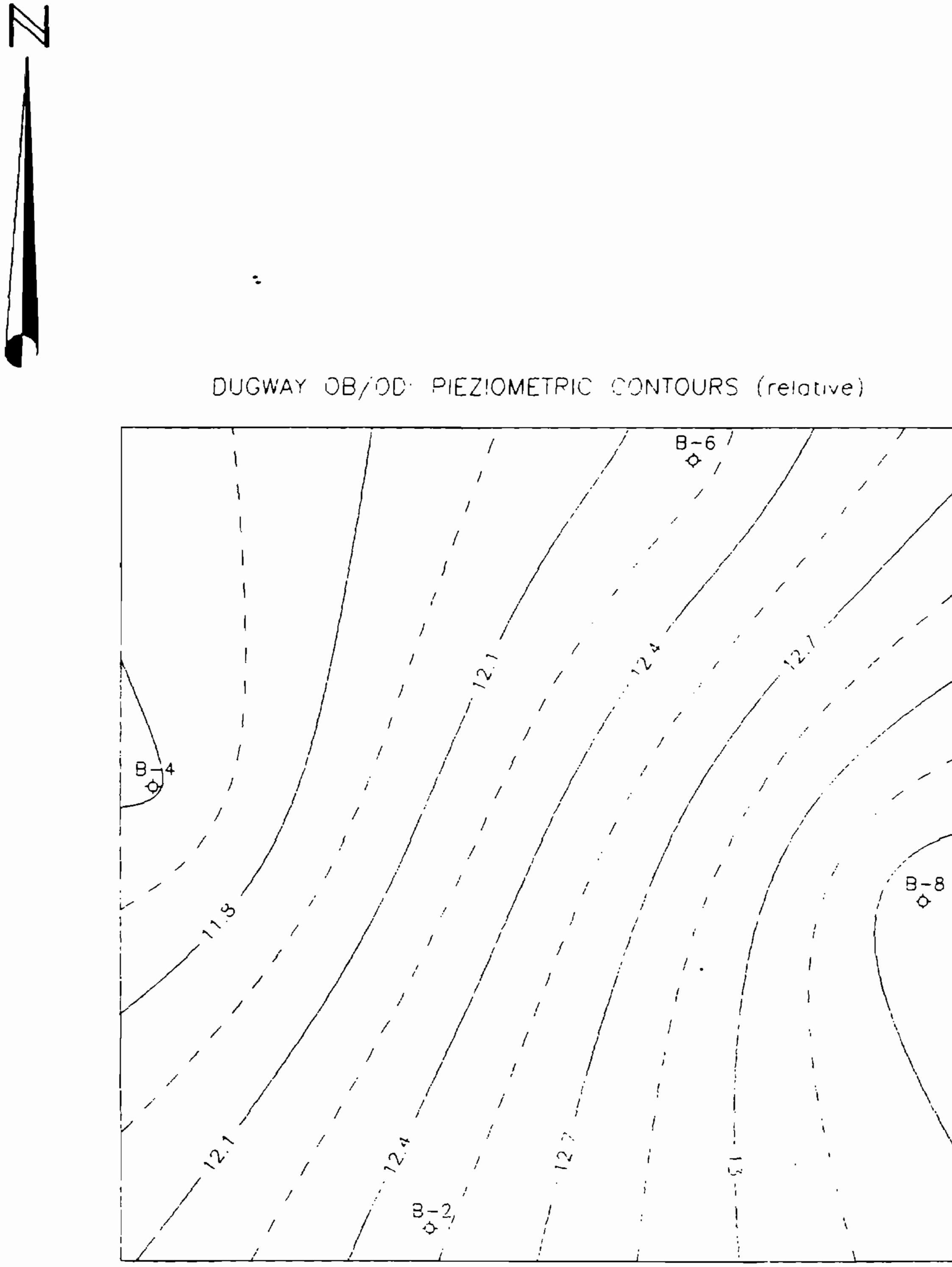
Depth-to-water measurements were made in the four installed wells and were converted to groundwater elevations using the surveyed casing elevation. These measurements indicate that the groundwater gradient was approximately 0.004 foot/foot toward the northwest during June 1993. A gradient map is shown on Plate 7.

4.5 OB/OD Area Soils

4.5.1 Shallow (0 to 5-foot) Soils

Samples were collected at 17 locations (B-1 through B-17) across the OB/OD area for analysis of explosive residues and metals. Five samples were also analyzed for volatile and semi-volatile organic compounds. Sample locations are shown on Plate 3. Samples were collected at depths of 0.5 to 1.0 foot and 4 to 5 feet from each location to assess vertical changes. Five duplicate samples were collected to assess

DUGWAY OB/OD PIEZIOMETRIC CONTOURS (relative)



SCALE 1 inch = 100 FEET

KLEINFELDER

SOIL AND GROUNDWATER INVESTIGATION
OPEN BURN/OPEN DETONATION AREA
DUGWAY PROVING GROUND

PIEZIOMETRIC CONTOURS
(relative elevations)

PLATE 7

PROJECT NO. 30-2025-14, 15 AND 18

measurement precision. No explosive residues (DNT, HMX, RDX, or TNT) were reported at concentrations exceeding reporting limits in the 39 soil samples. Reporting limits for DNT, HMX, RDX, and TNT are 0.25, 2.2, 1.0 and 0.25 mg/kg, respectively.

The laboratory did not detect targeted volatile or semi-volatile organic compounds in the five soil samples at concentrations above reporting limits. The laboratory did report the presence of tentatively identified compounds while analyzing for semi-volatiles in four of the soil samples as follows:

Location	Depth	Compound	Estimated Concentration mg/kg	Reporting Limit mg/kg
B-8	0.5	Total Aliphatic Hydrocarbons	2.0	1.0
B-8 (dup.)	0.5	Total Aliphatic Hydrocarbons	2.0	1.0
B-6	1.0	C_{19} to C_{20} Aliphatic Hydrocarbons	0.4	0.1
		2-(2-Ethoxyethoxy)-Ethanol	0.3	0.1
		C_{29} Fatty Acid	0.4	0.1
B-6	15	2-(2 Ethoxyethoxy)-Ethanol	0.4	0.1
		C_{16} Unsaturated Nitrile	0.1	0.1

Metals concentrations for the 39 shallow (0.5 and 5 foot) soil samples over the OB/OD area are summarized in Table 4. The table indicates the following:

- No mercury was detected above the reporting limit of 0.1 mg/kg in the samples.
- Reported lead concentrations are within the calculated background range of 4 to 18 mg/kg in the 39 samples.
- Cadmium concentrations are within or below the calculated background range of 1.8 to 5 mg/kg in the 39 soil samples.
- Selenium was reported at concentrations equal to or slightly above the reporting limit of 0.1 mg/kg in eight samples. Seven of the eight samples were analyzed in one batch by the analytical laboratory. However, laboratory QC data indicate

TABLE 4
ANALYTICAL RESULTS – SHALLOW SOILS (0 TO 5 FEET)
OB/OD AREA, DUGWAY PROVING GROUND

Sample Location	North Coordinate (feet)	East Coordinate (feet)	Sample Depth (feet)	Sample I.D. No.	METALS CONCENTRATIONS IN SOIL, IN MG/KG (PPM)							
					Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B-1	7220373.2	1267462.8	0.5-1.0	DPG593S01	4.7	130	2.8	9.3	5.3	<0.1	<0.1	1
			3.5-4.0	DPG593S02	4.4	170	3.6	12	9.3	<0.1	<0.1	1.9
B-2	7220282.4	1267310.4	0.5-1.0	DPG693S60	4.3	200	0.5	15	6.4	<0.1	<0.1	2.5
			3.5-4.0	DPG693S61	1.1	210	0.4	18	9.3	<0.1	0.1	2.5
B-3	7220397.6	1267192.7	0.5-1.0	DPG593S11	4	140	2.8	12	15	<0.1	<0.1	1.1
			0.5-1.0	DPG593S13	4.8	240	2.9	13	14	<0.1	<0.1	1
			4.5-5.0	DPG593S12	5.5	190	3.4	15	16	<0.1	<0.1	0.8
B-4	7220552.4	1267141.9	0.5-1.0	DPG593S50	5.4	170	<0.2	13	6.6	<0.1	<0.1	1.8
			3.5-4.0	DPG593S51	1	180	<0.2	15	<3.0	<0.1	<0.1	1.6
B-5	7220663.3	1267315.3	0.5-1.0	DPG593S14	5.5	210	1.8	9.1	13	<0.1	<0.1	0.9
			4.5-5.0	DPG593S15	8.2	380	3.4	16	16	<0.1	<0.1	1
B-6	7220748.8	1267468.9	0.5-1.0	DPG693S82	4.4	170	1.6	15	14	<0.1	<0.1	2.5
			3.5-4.0	DPG693S83	6.1	200	1.2	18	14	<0.1	<0.1	2.4
B-7	7220615.0	1267551.8	0.5-1.0	DPG593S16	4.3	200	3.3	14	15	<0.1	<0.1	1.3
			4.5-5.0	DPG593S17	3	120	1.4	6.8	9.6	<0.1	<0.1	1.3
B-8	7220484.5	1267610.4	0.5-1.0	DPG693S72	5	180	<0.2	16	17	<0.1	<0.1	2.1
			0.5-1.0	DPG693S73	4.5	170	<0.2	15	14	<0.1	<0.1	2.2
			3.5-4.0	DPG693S74	7.3	250	<0.2	22	17	<0.1	<0.1	2
B-9	7220151.1	1267574.4	0.5-1.0	DPG593S18	4.4	210	3	13	12	<0.1	<0.1	0.9
			4.5-5.0	DPG593S19	11	150	3.2	15	8.2	<0.1	<0.1	<0.5
B-10	7220069.0	1267238.0	0.5-1.0	DPG593S20	6.2	280	1.7	10	6.2	<0.1	<0.1	<0.5
			4.5-5.0	DPG593S21	8.1	200	2.9	13	14	<0.1	<0.1	<0.5
B-11	7220264.4	1266972.1	0.5-1.0	DPG593S22	7.6	230	<0.2	16	8.9	<0.1	<0.1	1.8
			4.5-5.0	DPG593S23	8.9	220	<0.2	16	11	<0.1	<0.1	1.7
B-12	7220587.7	1266890.2	0.5-1.0	DPG593S24	4.6	160	<0.2	14	7.6	<0.1	<0.1	1.6
			0.5-1.0	DPG593S25	6	190	0.2	16	12	<0.1	<0.1	2.2
			4.5-5.0	DPG593S26	6.4	290	0.3	14	11	<0.1	<0.1	2.6
B-13	7220894.6	1267198.9	0.5-1.0	DPG593S30	4.2	150	0.3	13	9	<0.1	0.1	2.1
			4.5-5.0	DPG593S31	9.9	270	0.4	24	14	<0.1	0.4	3
B-14	7220990.7	1267550.1	0.5-1.0	DPG593S27	4.6	82	0.4	12	9	<0.1	0.1	3.2
			4.0-4.5	DPG593S28	3.1	210	0.5	14	13	<0.1	0.3	3.7
B-15	7220746.8	1267771.3	0.5-1.0	DPG593S32	3.4	170	0.5	15	12	<0.1	<0.1	3
			4.5-5.0	DPG593S33	3.3	330	0.4	12	12	<0.1	0.5	3.1
B-16	7220452.4	1267845.7	0.5-1.0	DPG593S34	4	190	0.4	15	10	<0.1	0.1	2.8
			4.5-5.0	DPG593S35	5.8	180	0.3	17	12	<0.1	<0.1	2.8
B-17	7220516.0	1267389.3	0.5-1.0	DPG593S36	5	140	<0.2	12	8.6	<0.1	<0.1	2.1
			3.5-4.0	DPG593S37	4.8	130	0.7	16	18	<0.1	0.1	3.1

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selenium recoveries of about 70 to 75% for that sample set. These recoveries are very similar to recoveries for the other sample sets. The only three samples with reported concentrations of more than 0.1 mg/kg were collected from a depth of 4.5 to 5.0 feet (from B-13, B-14 and B-15).

- Arsenic concentrations are within or below the calculated background range of 3.5 to 9.6 mg/kg with the exception of two results: 11.0 mg/kg from 4.5 to 5.0 feet in B-9; and 9.9 mg/kg from 4.5 to 5.0 feet in B-13.

- Barium concentrations are within the calculated background range of 93 to 254 mg/kg with the exception of five samples. Four of the five samples are from a depth of 4.5 to 5 feet (B-5, B-12, B-13, B-15) and range from 270 to 380 mg/kg. The fifth sample contained 280 mg/kg, and was collected from 0.5 to 1.0 feet in B-10.

- Chromium concentrations are above the calculated background range of 7 to 18 mg/kg in two samples: 22 mg/kg at 4.5 to 5 feet in B-8; and 24 mg/kg at 4.5 to 5 feet in B-13.

- Silver exceeded the calculated background range of <0.5 to 2.8 mg/l in six samples. The highest silver result was 3.7 mg/l. The six samples above 2.8 were within one sample set (the same set that showed selenium in seven samples). Laboratory QC indicate silver recoveries for spikes in this sample set at about 103%. These recoveries are very similar to silver recoveries for the other sample sets. As with selenium, silver concentrations are slightly higher in the 4.5 to 5.0 foot depth than in the 0.5 to 1.0 foot depth.

4.5.2 Deep (5 to 97-foot) Soils

Since background concentrations were only evaluated in shallow soils (0 to 5 feet), deeper soil samples from the five borings may vary significantly from calculated background ranges due to normal vertical changes in soil type. To assess how metals concentrations vary with depth, the results for each boring are summarized on Table 5.

Table 5 indicates that most metals concentrations are significantly lower in the samples from 26.5 to 27 feet below ground surface than in the shallow background soils. This is probably due to a vertical change in lithology, since soils at that depth are coarser

TABLE 5
LABORATORY ANALYSIS – METALS IN SOILS AT DEPTH
OB/OD AREAD, DUGWAY PROVING GROUND

ARSENIC CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	4.3	5.4	4.4	5 4.5	5	4.8
3.5 – 4	1.1	1	6.1	7.3	4.8	4.1
7.5 – 8	3.4	3.5	3.7	1.7	3.3	3.1
14.5 – 15	1	0.8	5.7	3.9	3.9	3.1
26.5 – 27	2.4	2.9	1.4	1.8	1.6	2.0
96.5 – 97	2.9	3.6	7	1.7	2.3	3.5

BARIUM CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	200	170	170	180 170	140	172
3.5 – 4	210	180	200	250	130	194
7.5 – 8	300	220	170	330	260	256
14.5 – 15	99	120	120	130	190	132
26.5 – 27	23	37	30	24	90	41
96.5 – 97	140	120	95	180	160	139

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TABLE 5 (CONTINUED)
LABORATORY ANALYSIS – METALS IN SOILS AT DEPTH
OB/OD AREAD, DUGWAY PROVING GROUND

CADMIUM CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	0.5	<0.2	1.6	<0.2 <0.2	<0.2	0.4
3.5 – 4	0.4	<0.2	1.2	<0.2	0.7	0.5
7.5 – 8	0.6	<0.2	0.9	<0.2	0.7	0.5
14.5 – 15	0.4	<0.2	0.8	0.3	0.4	0.4
26.5 – 27	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
96.5 – 97	<0.2	0.5	0.8	<0.2	<0.2	0.3

CHROMIUM CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	15	13	15	16 15	12	14.3
3.5 – 4	18	15	18	22	16	17.8
7.5 – 8	15	15	12	11	15	13.6
14.5 – 15	21	19	17	16	15	17.6
26.5 – 27	4.5	5.2	5.8	5.1	6.2	5.4
96.5 – 97	5.3	15	13	5.7	6.4	9.1

TABLE 5 (CONTINUED)
LABORATORY ANALYSIS – METALS IN SOILS AT DEPTH
OB/OD AREAD, DUGWAY PROVING GROUND

LEAD CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	6.4	6.6	14	17 14	8.6	11.1
3.5 – 4	9.3	<3.0	14	17	18	12.0
7.5 – 8	9.6	5.8	9.8	10	13	9.6
14.5 – 15	11	6.8	13	12	11	10.8
26.5 – 27	<3	<3	<3	<3	<3	<3
96.5 – 97	<3	11	10	<3	<3	5.5

MERCURY CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	<0.1	<0.1	<0.1	<0.1 <0.1	<0.1	<0.1
3.5 – 4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
7.5 – 8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14.5 – 15	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26.5 – 27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
96.5 – 97	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

TABLE 5 (CONTINUED)
LABORATORY ANALYSIS – METALS IN SOILS AT DEPTH
OB/OD AREAD, DUGWAY PROVING GROUND

SELENIUM CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	<0.1	<0.1	<0.1	<0.1 <0.1	<0.1	<0.1
3.5 – 4	0.1	<0.1	<0.1	<0.1	0.1	<0.1
7.5 – 8	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
14.5 – 15	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26.5 – 27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
96.5 – 97	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

SILVER CONCENTRATIONS

Sample Depth (feet)	Sample Location					Average Conc. (mg/kg)
	B–2	B–4	B–6	B–8	B–17	
0.5 – 1	2.5	1.8	2.5	2.2 2.2	2.1	2.2
3.5 – 4	2.5	1.6	2.4	2.0	3.1	2.3
7.5 – 8	3.2	2.8	3.1	2.5	3.4	3.0
14.5 – 15	2.7	2.3	3.0	2.3	2.9	2.6
26.5 – 27	1.1	<0.5	1.4	0.9	1.2	1.0
96.5 – 97	1.3	3.0	3.0	2.0	<0.5	1.9

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-grained sands and gravels, while soils at the other sampling depths are generally fine grained clays and silts.

Barium concentrations are, in general, higher in the samples from 7.5 to 8 feet below ground surface than is the shallow background soils. The samples with higher barium concentrations also appear to have higher blow counts, indicating that the elevated barium concentrations may be associated with denser soils.

4.6 OB/OD Water Quality

Water samples were collected from B-2, B4, B-6, B-8 and B-17 for analysis of explosive residues and metals. The sample from B-17 was also analyzed for volatile and semi-volatile organic compounds. A duplicate sample was analyzed from B-17 to assess measurement precision.

The water samples from B-17 were collected from the boring after drilling. The samples from B-2, B-4, B-6 and B-8 were collected from wells that were installed, developed and purged prior to collecting the samples.

No explosive residues (DNT, HMX, RDX, TNT) were detected at concentrations above reporting limits in the five samples. The laboratory reporting limits for DNT, HMX, RDX, and TNT are 0.01, 0.02, 0.02, and 0.01 mg/l, respectively. The laboratory also analyzed the samples from B-17 for nitroglycerine*. No nitroglycerine was detected at concentrations exceeding the reporting limit of 0.02 mg/l.

No volatile or semi-volatile organic compounds were detected at concentrations above laboratory reporting limits in the two samples from B-17. The reporting limit for volatile organic compounds was 0.04 mg/l, except for 1,2-dichlorobenzene with a reporting limit of 0.10 mg/l. The reporting limits for semi-volatile organic compounds range from 0.1 to 10.0 mg/l, depending on the analyte.

No arsenic, mercury, selenium, or silver were detected at concentrations exceeding laboratory reporting limits in the six samples. Results are summarized in Table 6. The six groundwater samples contained barium at concentrations ranging from 0.045 to 0.12 mg/l. Cadmium was reported at a concentration equal to the reporting limit of

* Nitroglycerine was not requested, but was reported by the laboratory for the samples in laboratory sample set 14247.

TABLE 6
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
OB/OD AREA, DUGWAY PROVING GROUND

		EXPLOSIVE RESIDUES (mg/L)					METALS CONCENTRATIONS (mg/L)							
SAMPLE I.D.	LOCATION	DNT	HMX	RDX	TNT	Nitro Glycerine	As	Ba	Cd	Cr	Pb	Hg	Se	Ag
DPG62893503	B-2	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.089	0.004	0.02	<0.05	<0.001	<0.005	<0.01
DPG693567	B-4	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.12	<0.004	<0.01	<0.05	<0.001	<0.005	<0.01
DPG62893505	B-6	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.099	<0.004	0.01	<0.05	<0.001	<0.005	<0.01
DPG62893504	B-8	<0.01	<0.02	<0.02	<0.01	--	<0.005	0.072	<0.004	0.01	<0.05	<0.001	<0.005	<0.01
DPG593547	B-17	<0.01	<0.02	<0.02	<0.01	<0.02	<0.005	0.045	<0.004	<0.01	<0.05	<0.001	<0.005	<0.01
DPG593548	B-17	<0.01	<0.02	<0.02	<0.01	<0.02	<0.005	0.047	<0.004	<0.01	<0.05	<0.001	<0.005	<0.01

-- Not Analyzed

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0.004 mg/l in the sample from B-2. Chromium was reported at, or slightly above, the reporting limit of 0.01 mg/l in B-2, B-6, and B-8. Lead was detected at the reporting limit of 0.05 mg/l in B-8.

4.7 Quality Control Samples

Several types of quality control samples were analyzed to assess the validity of the analytical results discussed in Sections 4.1, through 4.3, 4.5, and 4.6. These include:

- Field duplicate samples - "duplicate" soil and ground water samples were collected and submitted for analysis to assess the precision (ability to get same result twice) of the data. The precision can be affected by laboratory precision, sampling/field protocol, and (especially in the case of soils) sample location inhomogeneity.

- Blanks - Three types of blanks were collected in the field with each sample set to assess the potential for contamination introduced during transport or sampling. These three types are trip blanks, rinsate blanks and field blanks. Trip blanks travel to and from the field with the sampling containers to assess potential cross-contamination during transport. Rinsate blanks are collected by rinsing decontaminated equipment in the field and capturing the rinse water to assess whether the equipment is clean. The field blanks are prepared in the field during sample collection to assess whether ambient environmental conditions affect the samples.

- Method blanks - The laboratory prepares and analyzes method blanks along with the sample set to assess the potential for contaminants to be introduced to the set by laboratory procedures.

- Matrix spike/matrix spike duplicates (MS/MSD) - The laboratory prepares and analyzes two matrix spikes by adding known quantities of target analytes to splits of one of the samples in a given "run". The known MS/MSD samples are then analyzed and the results are used to calculate accuracy (the amount of analyte recovered during analysis, expressed as a percent - 100% being completely accurate) and precision (how close the MS and MSD results are to each other, expressed as a percent relative difference - 0% being completely precise).

The QC results obtained during this inspection are discussed in the following subsections. Based on the QC results and on a review of field documentation, the data were reviewed for validity and quality. Data validation sheets are contained in Appendix C.

4.7.1 Field Duplicate Sample

Seven duplicate soil samples and one duplicate groundwater sample (representing approximately 8% and 20% of the total number of samples, respectively) were analyzed along with the primary samples. These duplicate samples were submitted "blind", i.e. with nothing to identify them to the laboratory as duplicates.

Explosive residues were only detected at one location where a duplicate sample was collected, SS-12 (near Burn Pan #2). DNT was reported at concentrations of 1.7 and 2.0 mg/kg in the duplicate samples from this location, a relative percent difference of 16%. This is generally considered good precision, especially for soil samples which are highly subject to spatial inhomogeneity. No other explosives (RDX, HMX, TNT) were reported in the pair.

Tentatively identified semi-volatile organic compounds were reported in the duplicate sample from 0.5 to 1 foot depth in B-8. In both samples, the laboratory reported 2 mg/kg of "total aliphatic hydrocarbons". No other volatile or semi-volatile compounds were reported in the pair.

Duplicate results for metals are shown on Table 7. With the exception of the two samples from D-5, the eight metals exhibit the following ranges of precision (relative percent difference).

Analyte	Range of RPDs (in %) for Duplicate Samples
Arsenic	-40 to +26.4
Barium	-5.7 to -52.6
Cadmium	+3.5 to +25.5
Chromium	-6.5 to 24.0
Lead	-19.4 to 44.9
Mercury	Not Calculated
Selenium	Not Calculated
Silver	-9.5 to 31.6

TABLE 7
ANALYTICAL RESULTS FOR DUPLICATE SOIL SAMPLES
AND CALCULATED RELATIVE PERCENT DIFFERENCES (RPDs)
OB/OD AREA, DUGWAY PROVING GROUND

Sample Location	Sample Depth (feet)	Lab. Sample Set #	Sample I.D. No.	METALS CONCENTRATIONS IN DUPLICATE SOIL SAMPLES, IN MG/KG (PPM)							
				Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B-3	0.5-1.0	14002	DPG593S11	4.0	140	2.8	12	15	<0.1	<0.1	1.1
			DPG593S13	4.8	240	2.9	13	14	<0.1	<0.1	1.0
			RPD* :	**18.2%**	**52.6%**	**3.5%**	**8.0%**	**-6.9%**	**NC**	**NC**	**-9.5%**
B-8	0.5-1.0	14368	DPG693S72	5.0	180	<0.2	16	17	<0.1	<0.1	2.1
			DPG693S73	4.5	170	<0.2	15	14	<0.1	<0.1	2.2
			RPD :	**-10.5%**	**-5.7%**	**NC**	**-6.5%**	**-19.4%**	**NC**	**NC**	**4.7%**
B-12	0.5-1.0	14394	DPG593S24	4.6	160	<0.2	14	7.6	<0.1	<0.1	1.6
			DPG593S25	6.0	190	0.2	16	12	<0.1	<0.1	2.2
			RPD :	**26.4%**	**17.1%**	**NC**	**13.3%**	**44.9%**	**NC**	**NC**	**31.6%**
SS12	0.5	13991	DPG593SS12	3.9	160	3.9	13	14	<0.1	<0.1	2.2
			DPG593SS25	4.1	190	4.7	14	19	<0.1	<0.1	2.3
			RPD :	**5.0%**	**17.1%**	**18.6%**	**7.4%**	**30.3%**	**NC**	**NC**	**4.4%**
SS-20	0.5	13991	DPG593SS20	3.0	130	2.8	9.5	12	<0.1	<0.1	2.2
			DPG593SS26	2.0	150	3.4	11	15	<0.1	<0.1	2.3
			RPD :	**-40.0%**	**14.3%**	**19.4%**	**14.6%**	**22.2%**	**NC**	**NC**	**4.4%**
D-5	0.5	14002	DPG593S30	4.2	150	0.3	13	9	<0.1	0.1	2.1
			DPG593S31	9.9	270	0.4	24	14	<0.1	0.4	3.0
			RPD :	**80.9%**	**57.1%**	**28.6%**	**59.5%**	**43.5%**	**NC**	**NC**	**35.3%**
BG-4	0.5	14002	DPG593S09	5.3	190	2.4	11	12	<0.1	<0.1	<0.5
			DPG593S10	5.4	190	3.1	14	14	<0.1	<0.1	0.7
			RPD :	**1.9%**	**0.0%**	**25.5%**	**24.0%**	**15.4%**	**NC**	**NC**	**NC**

*RPD : Relative Percent Difference (= the difference between the results divided by the average of the results)
**NC : Not Calculated. When one or both results are less than reporting limits, no RPD is calculated.

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The duplicate results for samples from D-5 are higher than these ranges, especially for chromium and arsenic. However, these samples are in the same laboratory set (14002) as results from B-3 and BG-4.

These precision results, which are affected by soil inhomogenity as well as laboratory measurement limitations, indicate acceptable measurement precision.

4.7.2 Field Blanks

Trip blanks

Ten trip blanks were analyzed for explosive residues and metals. No explosive residues were detected at concentrations above laboratory reporting limits. Arsenic was detected in one trip blank and barium was detected in four trip blanks, as follows.

Sample Set (Lab #)	Date Submitted	Trip Blank I.D. #	Analyte	Concentration (mg/l)
13991	May 5, 1993	DPG59301	Barium	0.004
14002	May 6, 1993	DPG59304	Barium	0.002
14504	June 21, 1993	DPG693S81	Barium	0.010
			Arsenic	0.008
14637	June 30, 1993	DPG62493S01	Barium	0.004

No other metals were detected at concentrations above laboratory reporting limits.

Field Blanks

Eleven field blanks were analyzed for explosive residues and metals. No explosive residues were detected by the laboratory above reporting limits. Barium was reported six of the field blanks. One blank also contained detectable cadmium and omium. Detected metals are summarized below.

Sample Set (Lab #)	Date Submitted	Trip Blank I.D. #	Analyte	Concentration (mg/l)
13991	May 5, 1993	DPG59302	Barium	0.003
14002	May 6, 1993	DPG59305	Barium	0.004
14298	June 2, 1993	DPG593S55	Barium	0.003
14394	June 10, 1993	DPG59307	Barium	0.005
14504	June 21, 1993	DPG693587	Barium	0.003
14637	June 30, 1993	DPG62493S02	Barium	0.00[illegible]
			Cadmium	
			Chromium	

Did they find out where Ba was coming from

No other metals were reported in the field blanks.

Rinsate Blanks

Ten rinsate blanks were analyzed for explosive residues and metals. No explosive residues were detected at concentrations above laboratory reporting limits. Barium was detected in six of the rinsate blanks, at concentrations ranging from 0.003 to 0.006 mg/l. These are summarized below.

Sample Set (Lab #)	Date Submitted	Trip Blank I.D. #	Analyte	Concentration (mg/l)
13991	May 5, 1993	DPG59303	Barium	0.004
14002	May 6, 1993	DPG59306	Barium	0.006
14298	June 2, 1993	DPG593S56	Barium	0.005
14394	June 10, 1993	DPG59308	Barium	0.003
14504	June 21, 1993	DPGG93S90	Barium	0.003

No other metals were reported in the rinsate blanks.

4.7.3 Method Blanks

The laboratory prepares and analyzes method blanks with each sample set. The laboratory did not detect explosive residues or volatile/semi-volatile organic compounds in the method blanks at concentrations above reporting limits. The laboratory analyzed the method blanks for the five metals analyzed by EPA Method 6010 (barium, cadmium, chromium, lead, and silver). The method blanks were generally not analyzed for the three metals analyzed by atomic absorption (arsenic, selenium, and mercury). The laboratory reported barium in sample set 13991 at a concentration of 0.008 mg/l, and in sample set 14002 at a concentration of 0.007 mg/l. No other metals were reported.

4.7.4 Matrix Spike / Matrix Spike Duplicates (MS/MSD)

The laboratory ran MS/MSDs with each sample set to evaluate laboratory precision and accuracy.

One explosive, RDX, was introduced into the MS/MSD to assess recoveries for the four target explosive compounds. Recoveries in the MS/MSD samples ranged from 76 to 110%, while relative percent differences ranged from -0.5 to 8.4%. These are acceptable ranges for precision and accuracy.

Five volatile organic compounds (benzene, chlorobenzene, 1,2-dichlorobenzene, toluene, and trichloroethene) were introduced into the MS/MSD to assess recoveries for volatile organics. Recoveries in the MS/MSD samples ranged from 82 to 116%. Relative percent differences ranged from -13 to 11%. These ranges are acceptable for precision and accuracy.

Various semivolatile organic compounds were introduced into the MS/MSD to assess recoveries for semivolatile organic compounds. Because many of these compounds (such as pentachlorophenol) are not very stable or easy to analyze, the acceptance ranges for precision and accuracy (as indicated by SW846) are very wide. The laboratory MS/MSD results indicate that semivolatile results are within acceptable ranges for precision and accuracy.

Each of the eight target metals was added to the MS/MSD pair to assess precision and accuracy. Ranges of recoveries and RPDs are as follows.

	Range of Reported Spike Recoveries (%)	Range of Reported RPDs (%)
Arsenic	71.6 to 110	-9.3 to 3.2
Barium	76.4* to 111.6	-3.6 to 5.5
Cadmium	86.5 to 110	-3.6 to 4.2
Chromium	87.3 to 108.2	-2.9 to 5.2
Lead	85.1 to 113.6	-7.6 to 1.8
Mercury	74 to 120	-9.2 to 6.1
Selenium	71.6 to 114.9	-4.1 to 8.4
Silver	90.9 to 108.2	-4.8 to 3.7

* All above 80% except one of four spikes on ticket 13991.

5.0 CONCLUSIONS

Based on the results of this investigation, it appears that surface soils around two of the Burn Pans (west and middle) have been somewhat impacted by low concentrations of explosive residues, primarily DNT. Soils around the middle Burn Pan also appear to have been impacted by lead.

Other soils investigated do not appear to be impacted by explosives or metals. Some metals concentrations in soil samples slightly exceed calculated background ranges, but are still well within normal ranges for soil and are likely the result of variations in soil type. Since lead is elevated around Burn Pan #2, places where lead concentrations exceed background ranges should be considered. Lead was reported at 22 mg/kg in one surface drainage (D-2) and 24 and 29 mg/kg in two samples around Burn Pan #1 (SS-5 and SS-3), respectively. While these concentrations exceed the calculated upper background concentration of 18 mg/kg, they may be a result of natural variation in normal soil concentrations. Since SS-3 also contains DNT, the reported lead of 29 mg/kg may be elevated due to site activities. However, D-2 and SS-5 do not display other evidence of impact.

Most of the slightly elevated metals concentrations were reported in soil samples collected 4 to 5 feet below ground surface, further indicating that variations in soil type with depth may be responsible. Metals concentrations clearly vary with depth and soil type in the five 98 foot borings.

Tentatively identified semivolatile compounds were reported in soils from B-8 (at 0.5 foot depth) and B-6 (at 0.5 foot and 15 foot depths). The reported concentrations were relatively low, generally at or just above reporting limits. Aliphatic hydrocarbons were reported in surface samples from B-8 and B-6. 2-(2-Ethoxyethoxy)Ethanol was reported in both samples from B-6. C_{29} fatty acid, reported in the surface sample from B-6, is likely natural in the environment. C_{16} Unsaturated Nitrile, reported in the 15-foot sample from B-6, may be a constituent of explosives or munitions. The reported concentrations are low and would need additional assessment to verify and evaluate their significance.

Groundwater samples do not appear to be impacted by operations at the OB/OD area. Low metals concentrations, primarily barium, are similar to concentrations reported in trip and field blanks and may be either naturally occurring in water (including di water) or may be introduced by the laboratory. The laboratory reported barium is one method blank.

6.0 LIMITATIONS

This report was prepared in general accordance with the accepted standard of practice which exists in Utah at the time the sampling was performed. Care was taken during sampling to collect representative samples. If the client wishes to reduce the uncertainty beyond the level associated with this survey, Kleinfelder should be notified for additional consultation. This report is not intended for use as an abatement removal plan or specification document.

Our firm has prepared this report for the Client's exclusive use for this particular project and in accordance with generally accepted practices within Utah at the time of the investigation. No other representations, expressed or implied, and no warranty or guarantee is included or intended.

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Dugway OB/OD Project Number: 30-2025-14.001 Date(s) of Field Work: 5/3/93

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
8:00	5/3	DPG 593 01	Lab	water	2	1L 8oz	∅		Trip blank
12:20	5/3	DPG 543 S01	B-01 (~~250'~~ 5')	Soil	1	S.S. ring	None	N	
12:35	5/3	DPG 593 S02	B-01/3.5	Soil	1	"	"	"	
12:48	5/3	DPG 543 S03	B-01/7.5 ~~250~~	Soil	1	"	"	"	NOT ANALYSED
13:05	5/3	DPG 543 S04	B-01/14.5	Soil	1	"	"	"	NOT ANALYSED
13:30	5/3	DPG 543 S05	B-01/26.5	Soil	1	"	"	"	NOT ANALYSED
		~~DPG 593 S06~~	~~B-01/100~~	~~Soil~~	~~1~~				
15:00	5/3	DPG 543 02	Field Blank	water	2	1 liter Amber 1 8oz Poly	None HNO_3	N Y	FIELD BLANK
15:15	5/3	DPG 543 03	Rinsate	water	2	1 liter Amber 1 8oz. Poly	None HNO_3	N Y	RINSATE BLANK
11:30	5/4	DPG 593 SS01	SS1	Soil	2	4 oz. glass			SW Burnpan, 10' north
11:32	5/4	DPG 593 SS02	SS2		3				SW Burnpan, 10' east; VOA
11:34	5/4	DPG 593 SS03	SS3		2				SW Burnpan, 10' south
11:36	5/4	DPG 593 SS04	SS4		2				SW Burnpan, 10' west
11:38		DPG 593 SS05	SS5		2				SW Burnpan, 35' north
11:40		DPG 593 SS06	SS6		2				SW Burnpan, 35' east
11:42		DPG 593 SS07	SS7		2				SW Burnpan, 35' south
11:44		DPG 593 SS08	SS8		2				SW Burnpan, 35' west

KLEINFELDER SAMPLE CONTROL LOG

Project Name: Dugway OB/OD Project Number: 30-2025-15 Date(s) of Field Work: 5/4-

	SAMPLE DESCRIPTION					SAMPLE CONTAINER				
	Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
7	13:20	5/4	DPG593 SS09	SS9	Soil	2	4oz. glass	N		Middle burnpan, 10' north
8	13:22		DPG593 SS10	SS10						middle burnpan, 10' east
9	13:24		DPG593 SS11	SS11						middle burnpan, 10' south
20	13:26		DPG593 SS12	SS12						middle burnpan, 10' west
21	13:28		DPG593 SS13	SS13						Middle burn pan, 35' north
22	13:30		DPG593 SS14	SS14						middle burnpan, 35' east
33	13:32		DPG593 SS15	SS15						middle burnpan, 35' south
24	13:34		DPG593 SS16	SS16						Middle burnpan, 35' west
5	13:50	5/4	DPG593 SS17	SS17		3				NE burnpan, 10' north, VOA
26	13:52		DPG593 SS18	SS18		2				NE burn pan, 10' east
27	13:54		DPG593 SS19	SS19		2				NE burnpan, 10' south
28	13:56		DPG593 SS20	SS20		2				NE burn pan, 10' west
9	13:58		DPG593 SS21	SS21		2				NE burn pan, 35' north
0	14:00		DPG593 SS22	SS22		2				NE burn pan, 35' east
1	14:02		DPG593 SS23	SS23		2				NE burn pan, 35' South
2	14:04		DPG593 SS24	SS24		2				NE burn pan, 35' west
33	13:36		DPG593 SS25	SS12		2				Dup. of 10' west of middle
4	14:06		DPG593 SS26	SS20		2				Dup. of 10' west of NE

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DPG CB/OD Project Number: 30-2025-15 [illegible] Date(s) of Field Work: 5-4, 5-5

	SAMPLE DESCRIPTION					SAMPLE CONTAINER				
	Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
6)	15:30	5/4	DPG593 S06-1;-5	B.G.1	Soil	2	4 o.z.	N		Background #1 - NE-most background 06-1 = 1' depth, 06-5 = 5' depth
7)	16:15	5/4	DPG593 S07-1;-5	B.G.2	"	2				B.G.2, 2nd from NE background
8)	16:30	5/4	DPG593 S08-1;-5	B.G.3	"	2				B.G.3, 2nd from S.W. background
	9 45	5 5	DPG593 S09-1;-5	B.G.4	"	4				B.G.4, SW-most background VOA collected
5	[illegible]	5 5	DPG593 S10-1;-5	B.G.4	"	2				Dup. of S09 (B.G.4)
	~~[illegible]~~	~~5/5~~	~~DPG593 S11~~							
	[illegible]	5/5	DPG593 SS27	D1	soil	1	SS ring			Drainage 1 [illegible]
	11 05	5/5	DPG593 SS30	D5	soil	3	4 oz jars			Drainage 5 [illegible]
	11 10	5/5	DPG593 SS31	D5	Soil	2	4 oz jars			Dup. of DPG593 SS31
	12 15	5/5	DPG593 SS29	D3	Soil	1	SS ring			Drainage 3. 2nd from SW-most drainage
	12 10	5/5	DPG593 SS28	D4	soil	1	SS ring			Drainage 4 2nd from NE most drainage
	12 20	5/5	DPG593 SS32	D2	Soil	1	S.S. ring			Drainage 2 SW most drainage
	13 20	5/5	DPG593 S11	B3, 1' depth	soil	1	SS ring			CB/OD SW at 250', 1 foot depth
	13 30	5/5	DPG593 S12	B3, 5' depth	soil	1	SS ring			CB/OD, SW at 250' 5 feet depth
	13 40	5/5	DPG593 S13	B3, 1' depth	"					Dup. of DPG593 S11
	13 50	5/5	DPG593 S14	B5 1' depth		3	4 oz jars			CB/OD, NW at 250', 1 feet depth Vol. organics
	14 00	5/5	DPG593 S15	B5, 5' depth		1	SS ring			CB/OD, SW at 250', 5 feet depth

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DPG - OB/OD Project Number: 30-2025-15 Date(s) of Field Work: 5/5

	SAMPLE DESCRIPTION					SAMPLE CONTAINER				
	Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
1	7:00	5/5	DPG 593 -04	Hiway/ Trip blank	water	2	1-1L 1-8oz		N Y	Trip blank
2	10:10	5/5	DPG 593 -05	site/ field blank	water	2	"		N Y	Field blank
3	10:15	5/5	DPG 593 -06	site/ rinsate blank	water	2	"		N Y	Rinsate blank
11	14.20	5/5	DPG 593 516	B7, 1' depth	Soil	1	S.S. ring			OB/OD, NE at 250', 1 foot depth
12	14.30	5/5	DPG 593 517	B7, 5' depth	Soil	1	S.S. ring			OB/OD, NE at 250', 5 foot depth
13	14:50	5/5	DPG 593 518	B9, 1' depth	Soil	1	S.S. ring			OB/OD, SE at 500', 1 foot depth
14	15:00	5/5	DPG 593 519	B9, 5' depth	Soil	1	S.S. ring			OB/OD, SE at 500', 5 foot depth
15	15:20	5/5	DPG 593 520	B10, 1' depth	Soil	1	S.S. ring			OB/OD, S at 500', 1 foot depth
16	15:30	5/5	DPG 593 521	B10, 5' depth	Soil	1	SS ring			OB/OD, South at 500', 5 foot depth
	10:20	5/6	DPG 593 522	B11, 1' depth	Soil	1	SS			OB/OD, SW at 500', 1 ft depth
	10:30	5/6	DPG 593 523	B11, 5' depth	Soil	1	SS.			OB/OD, SW at 500', 5 ft depth
	11:00	5/6	DPG 593 524	B12, 1'	Soil	3	4oz jars			OB/OD, West at 500', 1 ft depth
	11:05	5/6	DPG 593 525	B12, 1'	Soil	3	4 oz jars			Dup. of DPG 593-524
	11:10	5/6	DPG 593 526	B12, 5'	Soil	1	S.S.			OB/OD, west at 500', 5 ft depth
	11:35	5/6	DPG 593 -07	field Blank	water	2	1L 8oz		NO - this	field blank not filtered, previous have been
	11:45	5/6	DPG 593 -08	Rinsate Blank	"	"	"		NO "	"

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DUGWAY OB/OD   Project Number: 30-2025-~~15~~ 14.001   Date(s) of Field Work: 5-17-93 / 5-18-93

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
15:20	5/17	DPG593 527	B-14	SOIL	1	SS RING	N	N	0.5-1.0'
15:45	5/17	DPG593 528	B-14	"	"	"	"	"	4.0-4.5'
5:40	5/18/93	DPG593 529	HOUSE	WATER	2	AMBER [illegible]	4°C NO3	N	TRIP BLANK 30-2025-14.001
8:23	5/18/93	DPG593 530	B-13	SOIL	1	SS RING	N	N	0.5-1.0
8:35	5/18/93	DPG593 531	B-13	SOIL	1	SS RING	N	N	4.5-5.0
8:52	5/18/93	DPG593 532	B-15	SOIL	1	SS RING	N	N	0.5-1.0'
8:59	5/18/93	DPG593 533	B-15	"	"	"	"	4	4.5-5.0
9:12	5/18/93	DPG593 534	B-16	"	"	"	"	"	0.5-1.0
9:20	5/18/93	DPG593 535	B-16	"	"	"	"	"	4.5-5.0
9:41	5/18/93	DPG593 536	B-17	"	"	"	"	"	0.5-1.0
10:04	5/18/93	DPG593 537	B-17	"	"	"	"	"	3.5-4.0
10:13	5/18/93	DPG593 538	B-17	"	"	"	"	"	6.5-8.0
10:25	5/18/93	DPG593 539	B-17	"	"	"	"	"	13-14.5
12:50	5/18/93	DPG593 540	B-17	"	"	"	"	"	25-26.5
15:15	5/18/93	DPG593 541	B-17	WATER	2	AMBER Bty	4°C NO3	Y	FIELD BLANK
15:40	5/18/93	DPG593 542	B-17	WATER	2	"	"	Y	RINSATE BLANK

30-2025-14.001

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KLEINFELDER SAMPLE CONTROL LOG

Project Name: DIGWAY OB/OD Project Number: 30-2025-14.001 Date(s) of Field Work: 5-26

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
6:55	5/24/93	DPG593 S43	—	W	2	AMBER Poly	N	N	TRIP BLANK
10:40	5/26/93	DPG593 S44	B-17 96.5-97'	S	1	SS	N	N	B-17 96.5-97 STAINLESS STEEL
11:15	5/26/93	DPG593 S45	FIELD	W	2	AMBAR Poly	4°C HNO3	Y	FIELD BLANK
11:30	5/26/93	DPG593 S46	FIELD	W	2	AMBAR Poly	4°C HNO3	Y	RINSATE BLANK
11:55	5/26/93	DPG593 S47	B-17	W	5	40 mls AMBER Poly	l AMBAR Ploy	Y Y	FILTERING l AMBAR & POLY
12:15	5/26/93	DPG593 S48	B-17	W	5	1 GALL 11	40 mls 1 GAL	N N	NO FILTERING 40 MLS VOAS AND 1 GAL

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DPG OB/OD   Project Number: 30 2025 14.001   Date(s) of Field Work: 27 MAY 93 / 1 JUNE 93

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
06:00	27 MAY 93	DPG593549	TRIP	WATER	2	AMBER 1l POLY	— HNO3	N	TRIP BLANK
11:00	"	DPG593550	B-4 .5-1.0	SOIL	1	Stainless	N	N/A	
11:10	"	DPG593 S-S1	B-4 3.5-4.0	"	"	"	"	"	
11:25	"	DPG 593 S-S2	B-4 7.5-8.0	"	"	"	"	"	
11:35	"	DPG 593 S-S3	B-4 14.5-15	"	"	"	"	"	
11:55	"	DPG 593 S-S4	B-4 26.5-27	"	"	"	"	"	
12:35	"	DPG 593 S-S5	FIELD	WATER	2	AMBER POLY	— HNO3	"	FIELD BLANK
12:40	"	DPG 593 S-56	RINSATE	WATER	2	"	"	"	RINSATE BLANK
6:00	1 JUNE93	DPG 693 S-57	TRIP BLANK	WATER	2	AMBER POLY	— HNO3	N	TRIP BLANK
11 50	2 JUNE93	DPG 693 S 58	B-4 96½-97	SOIL	1	Stainless	—	—	

Lab # 11298

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DUGWAY OB/OD Project Number: 30-2025-14.001 Date(s) of Field Work: 3 JUNE 1993

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
11 30	3 JUNE	DPG 693 S-59	RINSATE	WATER	2	1L AMBER POLY	— HNO3	N	RINSATE BLANK
15:20	"	DPG 693 S-60	B-2 .5-1.0	SOIL	1	STAINLESS	NONE	N/A	
15:35		DPG-693 S-61	B-2 3.5-4.0	"	"	"	"	"	
15 50		DPG-593 S-62	B-2 7.5-8.0	"	"	"	"	"	
16:00		DPG-593 S-63	B-2 14.5-15	"	"	"	"	"	
6:40	3 June 93	DPG-593 S64	FIELD	WATER	2	1L Amber POLY	— HNO3	N	FIELD BLANK

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DPG OB/OD Project Number: 30-2025-14.001 Date(s) of Field Work: 4 JUNE 1993

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
06:00	4 JUNE 93	DPG 693 S65	TRIP	WATER	2	1L AMBER POLY	N Y HNO_3	N	TRIP BLANK
09:15	"	DPG 693 S66	B-2 27½-28	SOIL	1	STAINLESS	NONE	N/A	
11:30	4 JUNE 93	DPG 693 S67	B-4	WATER	2	1L AMBER POLY	N Y HNO_3	Y	WATER SAMPLE B-4
11:50	"	DPG 693 S68	FIELD	"	"	"	"	N	FIELD BLANK
13:40	"	DPG 693 S69	RINSATE	"	"	"	"	"	RINSATE BLANK
14:45	"	DPG 693 S70	B-4 96½-97	SOIL	1	STAINLESS	NONE	N/A	
			This should be B-2 96½-97						

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: [illegible]WAY OB/OD Project Number: 30-2025-14.001 Date(s) of Field Work: 6-8-93

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
6:20	6/8/93	DPG6 93571	OFFICE	W	2	1 AMBER POLY	4°C HNO3	N N	TRIP BLANK
9:10	6/8/93	DPG6 93572	B-8 0.5-1.0	SOIL	4	GLASS JAR	4°C	N	EXPLOSIVES, VOLITALES METALS & SEMI VOLITALES
9:20	6/8/93	DPG6 93573	B-8 0.5-1.0	SOIL	4	GLASS JAR	4°C	N	DUPLICATE OF DPG693572
9:30	6/8/93	DPG6 93574	B-8 2-4'	"	1	SS	4°C	N	
10:00	6/8/93	DPG6 93575	B-8 6-8	"	"	"	"	"	
11:20	6/8/93	DPG6 93577	B-8 25-27'	"	"	"	"	"	
10:50	6/8/93	DPG6 93578	FIELD	W	2	1 AMBER POLY	4°C HNO3	N	FIELD BLANK
11:50	6/8/93	DPG6 93579	B-8	W	"	"	"	Y	RINSATE BLANK
10:15	6/8/93	DPG693 576	B-8 13-15	S	1	SS	4°C	N	

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DUGWAY 08/00 Project Number: 30-2025-14,001 Date(s) of Field Work: 6-10-93, 6-18-93, 6-19-93

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
6/10/93	11:30	DPG693 S80	B-8W 95-97	S	1	SS	N	N	
~~6/11/93~~	~~6:15~~	~~DPG693 S81~~	~~OFFICE~~	~~W~~	~~2~~	~~AMBER POLY~~	~~4°C HNO3~~	~~N~~	~~TRIP BLANK~~ ~~DISPOSED~~ DUMPED
6/18/93	6:15	DPG693 S81	OFFICE	W	2	AMBER POLY	4°C HNO3	N	TRIP BLANK
6/18/93	15:45	DPG693 S82	B-6W, 0.5-1'	S	4	JARS	4°C	N	
6/18/93	15:50	DPG693 S83	B6W, 2-4'	S	1	SS	4°C	N	
6/18/93	16:05	DPG693 S84	B6W 6-8	S	1	SS	4°C	N	
6/18/93	16:20	DPG693 S85	B6W 13-15	S	1	SS	4°C	N	metals/explosives
6/18/93	16:35	DPG693 S86	B6W 13-15	S	1	SS	4°C	N	vols & semis
6/18/93	~~17:10~~ 16:45	DPG693 S87	FIELD	W	2	AMBER POLY	4°C HNO3	N N	FIELD BLANK
6/18/93	17:10	DPG693 S88	B6W 25-27	S	1	SS	4°C	N	
6/18/93	17:15	DPG693 S89	B6W 25-27	S	1	SS	4°C	N	NOT ANALYSED
6/18/93	17:30	DPG693 S90	B6W FIELD	W	2	AMBER POLY	4°C HNO3	Y Y	RINSATE BLANK
6/19/93	16 50	DPG693 S91	B6W 95-97	S	1	SS	4°C	N	

KLEINFELDER SAMPLE CONTROL LOG

Project Name: DPG OB/OD Wells Project Number: 30-2025-18 Date(s) of Field Work: 6/24-

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
8:15	6/24	DPG 62491.01	trip blank	water	2	8oz 1L	HNO3 4°C	N	

SampCont.WK1

KLEINFELDER SAMPLE CONTROL LOG

Project Name: [illegible] CB/CD   Project Number: 3-2025-14.001   Date(s) of Field Work: ______

SAMPLE DESCRIPTION					SAMPLE CONTAINER				
Time	Date	Field Sample Number	Sample Location	Matrix (soil, etc)	No. of Containers	Container Type	Preservative	Filtered? Y/N	Notes
13:30	6/28/93	DP6628 93502	FIELD	W	2	1 Amber Poly	4°C HNO3	N	FIELD BLANK
13:40	6/28/93	DP6628 93503	B-2	W	2	"	"	Y	B-2
14:00	6/28/93	DP6628 93504	B-8	W	"	"	"	Y	B-8
15:00	6/28/93	DP6628 93505	B-6	W	"	"	"	Y	B-6
8:15	6/24/93	DP6624 93501	TRIP						TRIP BLANK
									6/28/93
									WATER LEVELS
									B-2 87.68
									B-4 86.74
									B-6 85.99
									B-8 86.58

SampCont.WK1

PROJ NO	PROJECT NAME		NO OF CONTAINERS	Explosives (8330)	Metals (5)	8260 (F&D List)	8270 (F&D List)	REMARKS
30-2025-M -15-001								Lab# 13991
L.P. NO / P.O. NO.	SAMPLERS: (Signature/Number) Daniel Horne /2362							
DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.						
5/3/93	8:00	DPG 59301 W	2	X	X			
5/3/93	15:00	DPG 59302 W	2	X	X			
5/3/93	15:15	DPG 59303 W	2	X	X			
5/3/93	12:20	DPG593 S01	1	X	X			
5/3/93	12:35	DPG593 S02	1	X	X			
5/4/93	15:30	DPG593 S06 (-1 and -5)	2	X	X			Composit the two jars before anal
5/4/93	16:15	DPG593 S07 (-1 and -5)	2	X	X			Composit two containers before anal!
5/4/93	16:30	DPG593 S08 (-1 and -5)	2	X	X			Composit the two jars before anal
5/4/93	11:30	DPG593 SS01	2	X	X			
	11:32	DPG593 SS02	3	X	X	X	X	
	11:34	DPG593 SS03	2	X	X			
	11:36	DPG593 SS04	2	X	X			
	11:38	DPG593 SS05	2	X	X			
	11:40	DPG593 SS06	2	X	X			
	11:42	DPG593 SS07	2	X	X			
	11:44	DPG593 SS08	2	X	X			
	13:20	DPG593 SS09	2	X	X			
	13:22	DPG593 SS10	2	X	X			
	13:24	DPG593 SS11	2	X	X			
5/4/93	13:26	DPG593 SS12	2	X	X			

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horne	5/4 22:00	Renee Foley
Renee Foley	5/5 8:30	[signature]
[signature]	5/5/93 9:10	Received for Laboratory by: (Signature) [signature]

Remarks: 8330 - Report HMX RDX TNT DNT 2

Send Results To: Renee Follinger

KLEINFELDER
2749 ~~2681~~ EAST PARLEY'S WAY
SUITE ~~204~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

№ 421

Lab# 13919

PROJ NO	PROJECT NAME	NO OF CONTAINERS	ANALYSIS				REMARKS
30-202515 .001							
L.P. NO (P.O. NO)	SAMPLERS: (Signature/Number) Daniel Horns /2362						

DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.	NO OF CONTAINERS	Explosives (8330)	Metals (8)	8260 (F&D List)	8270 (F&D List)	REMARKS
5/4/93	13:28	DPG593 SS13	2	X	X			
	13:30	DPG593 SS14	2	X	X			
	13:32	DPG593 SS15	2	X	X			
	13:34	DPG593 SS16	2	X	X			
	13:50	DPG593 SS17	3	X	X	X	X	
	13:52	DPG593 SS18	2	X	X			
	13:54	DPG593 SS19	2	X	X			
	13:56	DPG593 SS20	2	X	X			
	13:58	DPG593 SS21	2	X	X			
	14:00	DPG593 SS22	2	X	X			
	14:02	DPG593 SS23	2	X	X			
	14:04	DPG593 SS24	2	X	X			
	13:36	DPG593 SS25	2	X	X			
5/4/93	14:06	DPG593 SS26	2	X	X			

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horns	5/4 22:00	Renee Zollinger
Relinquished by: (Signature) Renee Zollinger	5/5 8:30	Received by: (Signature) [signature]
Relinquished by: (Signature) [signature]	5/5/93 9:10	Received for Laboratory by: (Signature) Jennifer Hasel

Remarks

8330 - Report

HMX, RDX, TNT, DNT

Send Results To Renee Zollinger

KLEINFELDER
~~2001~~ 2749 EAST PARLEY'S WAY
SUITE ~~204~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

M-50 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

№ 422

"14"

PROJ NO 30-2025-15.09	CT NAME
LP NO / PO NO	SAMPLERS: (Signature/Number) Daniel Horns /2362

DATE MM/DD/YY	SAMPLE ID TIME HH:MM:SS	SAMPLE ID	NO OF CONTAINERS	Metals (8)	Explosives (8330*)	8260 (F and D List)	8270 (F and D List)	REMARKS
5/5/93	7:00	DPG593-04	2	X	X			waters
	10:10	DPG593-05	2	X	X			waters
	10:15	DPG593-06	2	X	X			waters
	~~[illegible]~~ 9:45	DPG593-S09 (-1 and -5)	4	X	X	X	X	composite -1 and -5 soil
	10:00	DPG593-S10 (-1 and -5)	2	X	X			composite -1 and -5
	13:20	DPG593-S11	1	X	X			
	13:30	DPG593-S12	1	X	X			
	13:40	DPG593-S13	1	X	X			
	13:50	DPG593-S14	3	X	X	X	X	
	14:00	DPG593-S15	1	X	X			
	14:20	DPG593-S16	1	X	X			
	14:30	DPG593-S17	1	X	X			
	14:50	DPG593-S18	1	X	X			
	15:00	DPG593-S19	1	X	X			
	15:20	DPG593-S20	1	X	X			
5/5/93	15:30	DPG593-S21	1	X	X			

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Daniel Horns	5/5 22:00	Renee Foley
Renee Foley	5/6 9:30	[illegible signature]
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) Judi Smith

Remarks *HMX, RDX, TNT, DNT on 8330

Level I QA

Send Results To Renee
KLEINFELDER
~~2001~~ 2749 EAST PARLEY'S WAY
SUITE ~~204~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

№ 423

#1411112

PROJ NO	PROJECT NAME
30-2025-15.001	

L P NO / P.O. NO.

SAMPLERS (Signature/Number): Daniel Horns /2362

DATE MM DD YY	SAMPLE I D TIME HH MM SS	SAMPLE I D	NO OF CONTAINERS	Metals (8)	Explosives (8330*)	8260 (F and D lists)	8270 (F and D lists)	REMARKS
5/5	10:50	DPG593-SS27	1	X	X			Soil
	12:10	DPG593-SS28	1	X	X			
	12:15	DPG593-SS29	1	X	X			
	11:05	DPG593-SS30	3	X	X	X	X	
	11:10	DPG593-SS31	2	X	X			
5/5	12:20	DPG593-SS32	1	X	X			

Relinquished by (Signature)	Date/Time	Received by (Signature)
Daniel Horns	5/5 22:00	Renee Foley
Renee Foley	5/6 9:30	[illegible]
		Received for Laboratory by (Signature): Judi [illegible]

Remarks: * HMX, RDX, TNT, DNT on 8330

Level I QA

Send Results To: Renee
KLEINFELDER
~~2601~~ 2749 EAST PARLEY'S WAY
SUITE ~~204~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

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№ 424

CHAIN OF CUSTODY

PROJ NO	PROJECT NAME	NO OF CONTAINERS	ANALYSIS: EXPLOSIVES (8330)	METALS (8)	REMARKS
30-2025-	Dugway OB/OD				LAB # K/141

L P NO / PO NO:

SAMPLERS: (Signature/Number) 2159

DATE MM DD YY	SAMPLED TIME HH MM SS	SAMPLE I D	NO OF CONTAINERS	EXPLOSIVES (8330)	METALS (8)	REMARKS
5/17/93	15:20	DPG593527	1	X	X	
5/17/93	15:45	DPG593528	1	X	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/19/93 17:35	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by (Signature)
	5/19/93 1735	

Remarks

8330 - REPORT

HMX, RDX, TNT, DNT AND ~~[illegible]~~

Send Results To: Renee Zollinger

KLEINFELDER
2749 ~~2601~~ EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

№ 365

PROJ NO	PROJECT NAME
30-2025 15.001	DUGWAY OB/OD
L P NO / P.O. NO.	SAMPLERS: (Signature/Number) [signature] 2159

LAB # 14141

DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.	NO OF CONTAINERS	ANALYSIS: EXPLOSIVES (8330)	METALS (8)	REMARKS
~~5/17/93~~	~~15:20~~	~~DPG593527~~	~~1~~	~~X~~	~~X~~	
~~5/17/93~~	~~15:45~~	~~DPG593528~~	~~1~~	~~X~~	~~X~~	
5/18/93	5:40	DPG593529	2	X	X	
5/18/93	8:23	DPG593530	1	X	X	
5/18/93	8:35	DPG593531	1	X	X	
5/18/93	8:52	DPG593532	1	X	X	
5/18/93	8:59	DPG593533	1	X	X	
5/18/93	9:12	DPG593534	1	X	X	
5/18/93	9:20	DPG593535	1	X	X	
5/18/93	9:41	DPG593536	1	X	X	
5/18/93	10:04	DPG593537	1	X	X	
5/18/93	10:13	DPG593538	1	X	X	
5/18/93	10:25	DPG593539	1	X	X	
5/18/93	12:50	DPG593540	1	X	X	
5/18/93	15:15	DPG593541	2	X	X	
5/18/93	15:40	DPG593542	2	X	X	

Relinquished by (Signature)	Date/Time	Received by (Signature)
[signature]	5/19/93 13:45	
Relinquished by (Signature)	Date/Time	Received by: (Signature)
Relinquished by (Signature)	Date/Time	Received for Laboratory by (Signature)
	5/19/93 1345	[signature]

Remarks

8330- REPORT

HMX, RDX, TNT, DNT AND NITROGLYCERINE

Send Results To RENÉE ZOLLINGER

KLEINFELDER
2749 ~~2681~~ EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

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CHAIN OF CUSTODY

№ 364

KLEINFELDER

14

PROJ NO	PROJECT NAME
30-2025-14,001	Dugway OB/OD
L P NO / P.O. NO.	SAMPLERS: (Signature/Number) 2159

DATE MM DD YY	SAMPLE TIME HH MM SS	SAMPLE I D	NO OF CONTAINERS	EXPLOSIVES 8330	METALS (8)	8260 (FED LIST)	8270 (FED LIST)	REMARKS
5/24/93	6:55	DPG593S43	2	X	X			WATER
5/26/93	10:40	DPG593S44	1	X	X			SOIL
5/26/93	11:15	DPG593S45	2	X	X			WATER
5/26/93	11:30	DPG593S46	2	X	X			WATER
5/26/93	11:55	DPG593S47	5	X	X	X	X	WATER
5/26/93	12:15	DPG593S48	5	X	X	X	X	WATER

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/26/93 16:35	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	5/27/93 9:05	
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)
	5/27/93 905	

Remarks

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

№ 361

CHAIN OF CUSTODY

KLEINFELDER

PROJ NO	PROJECT NAME	NO OF CONTAINERS	ANALYSIS: METALS *	EXPLOSIVE RESIDUES **	REMARKS
30-2025-14.001					LAB # 14298

L.P. NO / P.O. NO.

SAMPLERS: (Signature/Number) 2468

DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.	NO OF CONTAINERS	METALS *	EXPLOSIVE RESIDUES **	REMARKS
05/27/93	06:00	DPG-593-S49	2	X	X	
	11:00	DPG-593-S50	1	X	X	
	11:10	DPG-593-S51	1	X	X	
	11:25	DPG-593-S52	1	X	X	
	11:35	DPG-593-S53	1	X	X	
	11:55	DPG-593-S54	1	X	X	
	12:35	DPG-593-S55	2	X	X	
	12:40	DPG-593-S56	2	X	X	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	6/1 14:30	[signature]
[signature]	6/2 8:05	[signature]

Relinquished by: (Signature) · Date/Time · Received by: (Signature) · Received for Laboratory by: (Signature)

Remarks: TOTAL METALS INCLUDE
* ARSENIC, BARIUM, CADMIUM, CHROMIUM, LEAD, MERCURY, SELENIUM, SILVER.
** TNT, DNT, HMX, RDX

Send Results To
JOEL CARSEN
KLEINFELDER
~~2601~~ 2719 EAST PARLEY'S WAY
SUITE ~~204~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

№ 468

CHAIN OF CUSTODY

LAB # 14335

PROJ NO	PROJECT NAME
30-2025-14.001	

P.O. NO	SAMPLERS: (Signature/Number)
	/2468

DATE MM DD YY	SAMPLE TIME HH MM SS	SAMPLE ID	NO OF CONTAINERS	METALS (8)	EXPLOSIVE RESIDUE	REMARKS
06/01/93	06:00	DPG-693-S57	2	X	X	
06/02/93	11:50	DPG-693-S58	1	X	X	
06/03/93	11:30	DPG-693-S59	2	X	X	
	15:20	DPG-693-S60	1	X	X	
	15:35	DPG-693-S61	1	X	X	
	15:50	DPG-693-S62	1	X	X	
	16:00	DPG-693-S63	1	X	X	
	16:40	DPG-693-S64	2	X	X	

Relinquished by (Signature)	Date/Time	Received by (Signature)
J. Carson	6/4/93 15:00	Kurt A. H.
Kurt A. H.	1530 6/4/93	Received for Laboratory by (Signature): [signature]

Remarks

TOTAL METALS: ARSENIC, BARIUM, CADMIUM, CHROMIUM, LEAD, MERCURY, SELENIUM, SILVER

EXPLOSIVE RESIDUE: TNT, DNT, HMX, RDX

Send Results To: JOEL CARSON

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White · Sampler Canary · Return Copy To Shipper Pink · Lab Copy

CHAIN OF CUSTODY

№ 475

14359

PROJ. NO. / PROJECT NAME			NO OF CONTAINERS	ANALYSIS: METALS (8)	EXPLOSIVE RESIDUES	REMARKS
30-2025-14 001						
L.P. NO	SAMPLERS (Signature/Number) 2468					
DATE MM DD YY	SAMPLE I.D. TIME HH MM SS	SAMPLE I.D.				
06/04/93	06:00	DPG 693 S65	2	X	X	
	09:15	DPG 693 S66	1	X	X	
	11:30	DPG 693 S67	2	X	X	
	11:50	DPG 693 S68	2	X	X	
	13:40	DPG 693 S69	2	X	X	
	14:45	DPG 693 S70	1	X	X	

Relinquished by (Signature)	Date/Time	Received by (Signature)
[signature]	8 JUNE 93 10:45	[signature]
Relinquished by (Signature)	Date/Time	Received by (Signature)
Relinquished by (Signature)	Date/Time	Received for Laboratory by (Signature)
[signature]	6/9 13:15	[signature]

Remarks

TOTAL METALS ARSENIC, BARIUM, CADMIUM, CHROMIUM, LEAD, MERCURY, SELENIUM, SILVER

EXPLOSIVE RESIDUE: TNT, DNT, HMX, RDX

Send Results To JOEL G. CARSON

KLEINFELDER
~~2601~~ 2749 EAST PARLEY'S WAY
SUITE ~~204~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

M 60 White - Sampler Canary - R... Copy To Shipper Pink - Lab Copy

Nº ...74

CHAIN OF CUSTODY

PROJ NO	PROJECT NAME			
30-2023-14.001	Dugway OB/OD			Lab # 14368
LP NO / PO NO	SAMPLERS: (Signature/Number) [signature] 2159			

DATE MM DD YY	SAMPLE ID TIME HH MM SS	SAMPLE I D	NO OF CON TAINERS	ANALYSIS: METALS(8)	Explosive Residue	Volatile Organics	Semi Volatile Organics								REMARKS
6/8/93	6:20	DPG693571	2	X	X										WATER
6/8/93	9:10	DPG693572	4	X	X	X	X								SOIL
6/8/93	9:20	DPG693573	4	X	X	X	X								"
6/8/93	9:30	DPG693574	1	X	X										"
6/8/93	10:00	DPG693575	1	X	X										"
6/8/93	~~11:20~~ 10:15	DPG693576	1	X	X										"
6/8/93	~~10:50~~ 11:20	DPG693577	1	X	X										"
6/8/93	10:50	DPG693578	2	X	X										WATER
6/8/93	11:50	DPG693579	2	X	X										WATER

Relinquished by (Signature)	Date/Time	Received by: (Signature)
[signature]	6/8/93 19:00	[signature]
Relinquished by (Signature)	Date/Time	Received by: (Signature)
Relinquished by (Signature)	Date/Time	Received for Laboratory by: (Signature)
[signature]	6/9/93 8:37	Judi Smith

Remarks: Total metals(8): Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
Explosive Residue: TNT, DNT, HMX, RDX

Send Results To J. Carson

KLEINFELDER
~~2609~~ 2749 EAST PARLEY'S WAY
SUITE ~~201~~ 100
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

№ 380

PROJ NO	(T NAME	NO OF CON TAINERS	ANALYSIS: EXPLOSIVES (8330)	METALS (8)	REMARKS
	30-2025-15.001				Lab# 14394

L P NO / PO NO

SAMPLERS: (Signature/Number) Daniel Horne / 2362

DATE MM DD YY	SAMPLE I D TIME HH MM SS	SAMPLE I D	NO OF CONTAINERS	EXPLOSIVES (8330)	METALS (8)	REMARKS
05/06/93	10:20	DPG 593 S22	1	x	x	
05/06/93	10:30	DPG 593 S23	1	x	x	
05/06/93	11:00	DPG-593 S24	3	x	x	
05/06/93	11:05	DPG 593 S25	3	x	x	
05/06/93	11:10	DPG 593 S26	1	x	x	
05/06/93	11:35	DPG 593 -07	2	x	x	
05/06/93	11:45	DPG 593 -08	2	x	x	

Relinquished by (Signature)	Date/Time	Received by: (Signature)
Daniel Horne	6/9/93 11:00	[signature]
Relinquished by (Signature)	Date/Time	Received by: (Signature)
Relinquished by (Signature)	Date/Time	Received for Laboratory by: (Signature)
[signature]	13:07 10 JUNE 1993	Jennifer Hagel

Remarks

EXPLOSIVE RESIDUES : DNT, HMX, RDX, TNT

Metals: Arsenic, barium, cadmium, chromium, lead mercury selenium silver

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

A-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy № 473

CHAIN OF COUSTODY

CHAIN OF CUSTODY

PROJ. NO. 30-2025-14-001

PROJECT NAME: Dugway 1193/UD

SAMPLERS (Signature/Number): [signature] 2159

LAB # 4564

DATE	SAMPLE TIME	SAMPLE I.D.	NO. OF CONTAINERS	ANALYSIS	EXPLOSIVES	METALS	VOLATILES (8240)	SEMI-VOLATILES (8270)								REMARKS
6/18/93	6:15	DPG693581	2	X	X											
6/18/93	15:45	DPG693582	4	X	X	X	X									
6/18/93	15:50	DPG693583	1	X	X											
6/18/93	16:05	DPG693584	1	X	X											
6/18/93	16:20	DPG693585	1	X	X											
6/18/93	16:35	DPG693586	1			X	X									
6/18/93	16:45	DPG693587	2	X	X											
6/18/93	17:10	DPG693588	1	X	X											
~~6/18/93~~	~~17:15~~	~~DPG693589~~	~~1~~	~~X~~	~~X~~											
6/18/93	17:30	DPG693590	2	X	X											
6/19/93	16:50	DPG693591	1	X	X											

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
[signature]	6/21/93 7:3?	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by (Signature)
	6/21/93 9:30	[signature]

Remarks

EXPLOSIVES: DNT, HMX, RDX, TNT

METALS: AG, AS, BA, CD, CR, HG, PB, SE

Send Results To: JOEL G. CARSON

KLEINFELDER
~~2681~~ 741 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

4/60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

№ 377

CHAIN OF CUSTODY

PROJECT NO.	PROJECT NAME	NO. OF CONTAINERS	ANALYSIS: METALS	EXPLOSIVES	REMARKS
14,001	Dugway OB/OD				LAB # 14504

SAMPLERS (Signature/Number) 2159

DATE	SAMPLED TIME	SAMPLE ID	NO. OF CONTAINERS	METALS	EXPLOSIVES	REMARKS
6/16/93	11:30	DPG693580 8'	1	X	X	

Relinquished by (Signature)	Date/Time		Received by (Signature)
	6/1/93	10:05	
Relinquished by (Signature)	6/2/93	9:36	Received by (Signature)
Relinquished by (Signature)	6/21/93	9:00	Received for ~~laboratory~~ by (Signature)

Remarks

METALS: AG, AS, BA, CD, CR, HG, PB, SE

EXPLOSIVES: DNT, HMX, RDX, TNT

Send Results To

KLEINFELDER
2681 EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

White · Sampler   Canary · Return Copy To Shipper   Pink · Lab Copy

№ 379

LAR # 14637

PROJ NO: 30-2025-18.001

PROJECT NAME

L P NO / P.O. NO.

SAMPLERS: (Signature/Number) 2159

DATE MM DD YY	SAMPLE ID TIME HH MM SS	SAMPLE ID	NO OF CONTAINERS	ANALYSIS: metals	explosives	REMARKS
06/24/93	08:15	DPG 62493 S01	2	X	X	
6/28/93	13:30	DPG 62893 S02	2	X	X	
	13:40	DPG 62893 S03	2	X	X	
	14:00	DPG 62893 S04	2	X	X	
	15:00	DPG 62893 S05	2	X	X	

Relinquished by (Signature)	Date/Time	Received by: (Signature)
	6/30/93 12:25	

Relinquished by (Signature)	Date/Time	Received by: (Signature)

Relinquished by (Signature)	Date/Time	Received for Laboratory by: (Signature)
	6/30/93 1230	

Remarks

metals: Ag, As, Ba, Cd, Cr, Hg, Pb, Se

explosives: DNT, HMX, RDX, TNT

Send Results To Joel G. Carson

KLEINFELDER
2749 ~~2681~~ EAST PARLEY'S WAY
SUITE 204
SALT LAKE CITY, UT 84109
(801) 466-6769

M-60 White - Sampler Canary - Return Copy To Shipper Pink - Lab Copy

CHAIN OF CUSTODY

№ 470

DUGWAY PR... G GROUND
O.D.O.B. AREA SAMPLES

SWMU AREA O.D.O.B.	SAMPLE NUMBER	STATE PLANE 1983 N.A.D. SEA LEVEL (FEET)		UTM COORDINATES (METERS)		GROUND ELEVATIONS
		NORTH	EAST	NORTH	EAST	
"	BG-1	7,219,715.242	1,268,072.187	4,444,058.076	343,938.591	4429.0
"	BG-2	7,219,532.715	1,267,588.762	4,444,003.733	343,790.934	4428.3
"	BG-3	7,219,380.033	1,267,148.453	4,443,957.965	343,656.462	4424.3
"	BG-4	7,219,215.651	1,266,446.902	4,443,909.086	343,442.348	4421.3
"	D-1	7,220,188.171	1,267,839.783	4,444,203.074	343,868.583	4425.4
"	D-2	7,220,241.827	1,266,650.327	4,444,221.502	343,506.140	4418.5
"	D-3	7,220,794.294	1,266,626.950	4,444,389.930	343,499.979	4416.0
"	D-4	7,221,041.483	1,266,838.201	4,444,464.903	343,564.798	4417.7
"	D-5	7,221,216.272	1,267,117.961	4,444,517.689	343,650.371	4417.6
"	B-1	7,220,373.293	1,267,462.870	4,444,230.156	343,753.855	4423.6
"	B-2	7,220,282.473	1,267,310.422	4,444,232.739	343,707.403	4423.6
"	B-3	7,220,397.642	1,267,192.749	4,444,268.047	343,671.738	4422.3
"	B-4	7,220,552.489	1,267,141.987	4,444,315.332	343,656.536	4421.4
"	B-5	7,220,663.357	1,267,315,367	4,444,348.821	343,709.575	4421.7
"	B-6	7,220,748.865	1,267,468.917	4,444,374.615	343,756.525	4421.6
"	B-7	7,220,615.005	1,267,551.869	4,444,333.671	343,781.575	4422.5
"	B-8	7,220,484.599	1,267,610.451	4,444,293.822	346,799.202	4423.4
"	B-9	7,220,151.129	1,267,574.479	4,444,192.246	343,787.656	4425.1

DUGWAY PROVING GROUND
O.D.O.B. AREA SAMPLES

SWMU AREA O.D.O.B.	SAMPLE NUMBER	STATE PLANE 1983 N.A.D. SEA LEVEL (FEET)		UTM COORDINATES (METERS)		GROUND ELEVATIONS
		NORTH	EAST	NORTH	EAST	
"	B-10	7,220,069.070	1,267,238.085	4,444,167.821	343,684.983	4423.8
"	B-11	7,220,264.485	1,266,972.173	4,444,227.847	343,604.276	4421.3
"	B-12	7,220,587.702	1,266,890.289	4,444,326.504	343,579.883	4419.0
"	B-13	7,220,894.654	1,267,198.945	4,444,419.522	343,674.493	4420.0
"	B-14	7,220,990.790	1,267,550.196	4,444,448.210	343,781.719	4420.5
"	B-15	7,220,746.837	1,267,771.380	4,444,373.469	343,848.710	4422.3
"	B-16	7,220,452.453	1,267,845.786	4,444,283.634	343,870.874	4424.7
"	B-17	7,220,516.004	1,267,389.362	4,444,303.780	343,731.870	4422.5
"	B-17A	7,220,519.708	1,267,388.842	4,444,304.909	343,731.719	4422.5
"	SS-01	7,220,776.967	1,266,860.198	4,444,384.243	343,571.041	4418.6
"	SS-02	7,220,753.763	1,266,870.272	4,444,377.152	343,574.070	4419.7
"	SS-03	7,220,737.080	1,266,856.340	4,444,372.091	343,569.795	4418.8
"	SS-04	7,220,756.095	1,266,841.848	4,444,377.913	343,565.412	4418.4
"	SS-05	7,220,801.102	1,266,859.086	4,444,391.600	343,570.744	4418.6
"	SS-06	7,220,752.457	1,266,895.021	4,444,376.711	343,581.612	4418.9
"	SS-07	7,220,712.207	1,266,855.825	4,444,364.512	343,569.595	4418.6
"	SS-08	7,220,757.891	1,266,817.352	4,444,378.503	343,557.948	4418.2
"	SS-09	7,220,970.875	1,267,452.680	4,444,442.210	343,751.963	4420.2

OT
SING
LEVATION

DUGWAY PR... ..G GROUND
O.D.O.B. AREA SAMPLES

SWMU AREA O.D.O.B.	SAMPLE NUMBER	STATE PLANE 1983 N.A.D. SEA LEVEL (FEET)		UTM COORDINATES (METERS)		GROUND ELEVATIONS
		NORTH	EAST	NORTH	EAST	
"	SS-10	7,220,950.950	1,267,469.732	4,444,436.208	343,757.125	4420.3
"	SS-11	7,220,940.918	1,267,453.914	4,444,433.177	343,752.287	4420.5
"	SS-12	7,220,957.180	1,267,443.334	4,444,438.153	343,749.090	4420.2
"	SS-13	7,220,996.749	1,267,459.772	4,444,450.185	343,754.169	4420.2
"	SS-14	7.220,946.100	1,267,494.179	4,444,434.687	343,764.569	4420.5
"	SS-15	7,220,916.831	1,267,450.627	4,444,425.842	343,751.243	4420.6
"	SS-16	7,220,956.999	1,267,416.909	4,444,438.142	343,741.036	4420.3
"	SS-17	7,221,157.729	1,267,885.392	4,444,498.507	343,884.176	4422.1
"	SS-18	7,221,142.315	1,267,904.063	4,444,466.561	343,215.129	4222.7
"	SS-19	7,221,122.151	1,267,886.038	4,444,487.662	343,884.311	4422.9
"	SS-20	7,221,131.610	1,267,862.789	4,444,490.586	343,887.241	4422.6
"	SS-21	7,221,178.983	1,267,873.899	4,444,505.006	343,880.710	4422.3
"	SS-22	7,221,148.140	1,267,928.641	4,444,495.509	343,897.341	4423.2
"	SS-23	7,221,101.753	1,267,899.939	4,444,481.371	343,897.254	4423.1
"	SS-24	7,221,122.586	1,267,841.180	4,444,487.873	343,870.639	4422.7

DEPTH IN FEET (0–50)

Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
	8		DPG593S60	CL	
	8		DPG593S61		
	26		DPG593S62		SILTY CLAY (CL) - light brown, moist
				CH	
	36		DPG593S63		CLAY (CH) - light gray-brown, slightly moist
				CH	CLAY (CH) - brown, slightly moist
				SM	FINE SAND (SM) - light brown
	56				
				GM	GRAVEL (GM)
				CL	SILTY CLAY (CL) - brown
				GM	SANDY GRAVEL (GM) - brown, moist

DATE DRILLED: **6-4-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **6.25 inches**

LOGGED BY: **Joel Carson**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4423.0**

KLEINFELDER

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

LOG OF MONITOR WELL B2

DPG-OB/OD
Dugway Proving Ground

PLATE
B-1

Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	Sample	USCS	SOIL DESCRIPTION	Well Graphics
					SP	MEDIUM SAND (SP) - with some gravel, brown, moist	
					SP SM	SAND (SP-SM) - light brown, moist	
					SM	SILTY SAND (SM) - light brown, moist	
					CL	CLAY (CL) - brown, moist	
					CH	CLAY (CH) - with seams of sand, brown	
					SP	FINE SAND (SP) - brown, wet	
					ML CL	INTERBEDDED SAND, SILT, AND CLAY	

DEPTH IN FEET: 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100

DATE DRILLED: **6-4-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **6.25 inches**

LOGGED BY: **Joel Carson**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4423.0**

KLEINFELDER

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

LOG OF MONITOR WELL B2

DPG-OB/OD
Dugway Proving Ground

PLATE

B-1

CONTINUED

Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
	8		DPG593S50	CL	
	9		DPG593S51		
	47		DPG593S52		SILTY CLAY (CL) - light brown, moist
	65		DPG593S53	CH	CLAY (CH) - with iron mottling, gray-brown, slightly moist
	62		DPG593S54	GP	
	70				SANDY GRAVEL (GP) - up to cobble size, brown, slightly moist, very dense
					Some lenses of sand
	59	0.2		ML	SILT (ML) - light brown, moist, hard
	41	0.7			
				SP	SAND (SP) - brown, moist, dense
	44	0.0		CH	CLAY (CH) - white, slightly moist, hard
				ML	SANDY SILT (ML) - light brown, slightly moist, hard

DEPTH IN FEET: 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50

Well Graphics

DATE DRILLED: **6-2-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **6.25 inches**

LOGGED BY: **Joel Carson**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4421.0**

KLEINFELDER

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

LOG OF MONITOR WELL B4

DPG-OB/OD
Dugway Proving Ground

PLATE **B-2**

Depth (ft)	Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
50–51		72	0.0			
51–56		57	0.7		GP	SANDY GRAVEL (GP) - brown, moist, very dense
56–66.5		51	0.7		SP	MEDIUM SAND (SP) - with some gravel, brown, moist
66.5–72.5					SP SM	SAND (SP-SM) - light brown, moist
72.5–78		39			SM	SILTY SAND (SM) - light brown, moist
78–82.5					CL	CLAY (CL) - brown, moist
82.5–94.5	▼ (87) ▽ (94)				CH	CLAY (CH) - brown With seams of sand
94.5–96.5		44			SP	FINE SAND (SP) - brown, wet
96.5–97					ML CL	INTERBEDDED SAND, SILT, AND CLAY

DEPTH IN FEET

DATE DRILLED: **6-2-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **6.25 inches**

LOGGED BY: **Joel Carson**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4421.0**

KLEINFELDER

PROJECT NO. **30-2025-18.001** Revised: **8/6/1993**

LOG OF MONITOR WELL B4

DPG-OB/OD
Dugway Proving Ground

PLATE
B-2
CONTINUED

DEPTH IN FEET	Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
0				DPG693S82	CL	
2		21	0.8	DPG693S83		
4						
6		30	0.8	DPG693S84		SILTY CLAY (CL) - light brown, slightly moist
8						
10						
12					CH	
14		76	1.00.8	DPG693S85		
16						
18						CLAY (CH) - with iron mottling, gray-brown, slightly moist
20						
22						
24					GP GM	
26		157	1.0	DPG693S88		SANDY GRAVEL (GP-GM) - light brown, slightly moist
28					CL CH	
30						
32						
34						
36						
38						
40						CLAY (CL/CH)
42						
44						
46						
48						
50						

DATE DRILLED: **6-20-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **8 inches**

LOGGED BY: **Roy McDonald**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4421.0**

KLEINFELDER

LOG OF MONITOR WELL B6

DPG-OB/OD
Dugway Proving Ground

PLATE **B-3**

PROJECT NO. **30-2025-18.001** Revised: **8/6/1993**

Depth (ft)	Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	Sample	USCS	SOIL DESCRIPTION	Well Graphics
50						GP GM		
52								
54								
56							GRAVEL (GP-GM)	
58								
60								
62						CL		
64								
66								
68								
70								
72								
74								
76								
78								
80							CLAY (CL) - brown, moist	
82								
84							With seams of silt	
86								
88	▼							▼
90								
92								
94	▽							▽
96		55	1.8	DPG693S91				
98								
100								

DEPTH IN FEET

DATE DRILLED: **6-20-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **8 inches**

LOGGED BY: **Roy McDonald**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4421.0**

KLEINFELDER

LOG OF MONITOR WELL B6

DPG-OB/OD
Dugway Proving Ground

PLATE **B-3** CONTINUED

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

Depth (ft)	Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
0–5.5				DPG693S72	CL	SILTY CLAY (CL) - light brown, slightly moist
		21	1.7	DPG693S74		
5.5–13		27	0.8	DPG693S75	CL	SILTY CLAY (CL) - with iron mottling, light gray, moist
13–22		47	0.8	DPG693S76	CH	CLAY (CH) - some silt and iron mottling, gray-brown, moist
22–29		111	0.7	DPG693S77	GP GM	SANDY GRAVEL (GP-GM) - light brown, slightly moist
29–39					GC	INTERBEDDED CLAY AND GRAVEL
39–50					CL	CLAY (CL)

DEPTH IN FEET

DATE DRILLED: **6-10-93**	LOGGED BY: **Roy McDonald**
TOTAL DEPTH: **97.0 feet**	EQUIPMENT: **CME 75 with hollow stem auger**
DIAMETER OF BORING: **8 inches**	ELEVATION: **4423.0**

KLEINFELDER

LOG OF MONITOR WELL B8

DPG-OB/OD
Dugway Proving Ground

PLATE **B-4**

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

Depth (ft)	Water Level	Blows/Ft.	OVM Reading (ppmv)	Sample I.D.	Sample	USCS	SOIL DESCRIPTION	Well Graphics
50						GP GM		
52								
54								
56								
58								
60							GRAVEL (GP-GM)	
62								
64								
66								
68						CL CH		
70								
72							CLAY (CL-CH)	
74								
76								
78						GP GM	GRAVEL (GP-GM)	
80						CL		
82								
84								
86							CLAY (CL)	
88								
90								
92								
94						ML		
96		66	1.8	DPG693S80			SANDY SILT (ML) - wet	
98								
100								

DEPTH IN FEET

DATE DRILLED: **6-10-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **8 inches**

LOGGED BY: **Roy McDonald**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4423.0**

KLEINFELDER

LOG OF MONITOR WELL B8

DPG-OB/OD
Dugway Proving Ground

PLATE **B-4** CONTINUED

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

Water Level	Blows/Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
	6		DPG593S36	CL	SILTY CLAY (CL) - light brown, moist
	6	1.2	DPG593S37		
	17	1.2	DPG593S38		
	46		DPG593S39	CH	CLAY (CH) - light grayish brown with iron mottling, slightly moist
	43			CH	SILTY CLAY (CH) - brown, slightly moist
	38	0.7	DPG593S40	SM	FINE SAND (SM) - with silt, light brown
	150			GM	GRAVEL (GM) - 1" to 3" clasts in cuttings
	30	0.2		CL	SILTY CLAY (CL) - brown, slightly moist
	29	0.2		ML	SILT (ML) - with sand and a trace of clay, brown, slightly moist
	56	0.2		CL	SILTY CLAY (CL) - light gray, slightly moist

DEPTH IN FEET: 0–50

DATE DRILLED: **5-26-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **6.25 inches**

LOGGED BY: **Roy McDonald**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4422.0**

KLEINFELDER

LOG OF BORING B17

DPG-OB/OD
Dugway Proving Ground

PLATE B-5

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

Depth (ft)	Water Level	Blows/ Ft.	OVM Reading (ppmv)	Sample I.D.	USCS	SOIL DESCRIPTION
50		83			GP GM	SANDY GRAVEL (GP-GM) - some silt, light brown, slightly moist
55		56	0.2			
60		31	0.7			
64					CH	CLAY (CH) - with black amorphic organics and iron mottling, gray-brown, moist, hard
65		26	0.7			
68.5					SP SM	FINE SAND (SP-SM) - light brown, slightly moist
70		54	0.7			
74.5					SM	SILTY SAND (SM) - light brown, slightly moist, dense
75		40	0.7			
78.5					CL	CLAY (CL) - with black amorphic organics, light brown, moist, hard
80		25	0.2			
83					CH	CLAY (CH) - with seams of fine sand and iron mottling, gray-brown, moist, hard
85		31	0.7			
87	▼					
89					CL	CLAY (CH) - with silt and iron mottling, gray-brown, moist, hard
90		25	0.7			
91					ML	SANDY SILT (ML) - very moist
92					CL	CLAY (CL) - with silt and iron mottling, gray-brown, moist, hard
94	∇					
94.5					SP	FINE SAND (SP) - brown, wet
95		21	0.2	DPG593S44		
95.5					ML CL	INTERBEDDED SAND, SILT, CLAY (ML-CL) - brown, wet

DEPTH IN FEET

DATE DRILLED: **5-26-93**
TOTAL DEPTH: **97.0 feet**
DIAMETER OF BORING: **6.25 inches**

LOGGED BY: **Roy McDonald**
EQUIPMENT: **CME 75 with hollow stem auger**
ELEVATION: **4422.0**

KLEINFELDER

PROJECT NO. **30-2025-18.001** **Revised: 8/6/1993**

LOG OF BORING B17

DPG-OB/OD
Dugway Proving Ground

PLATE
B-5
CONTINUED

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG { 59301-03, 593S01-S02, S06-S08 / 5935S01 through SS 26	Lab Report No.	L13991
Sample Date	May 4, 1993	Chain-of-Custody No.	421, 422
Sample Location	Various, see Sample ID log	Reviewed By:	RDZ
Sample Depth	Various, " " " "	Review Date:	7/26/93

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	Sample Log, Field Notes	
Field Screening	NA		
2. Locations and Description of Activities			
Maps - Location Identification	✓	Surveyor Map	
Boring Logs - Sample Depth	✓	Field Logs/Notes	
Screening Technique	NA		
3. Chain-of-Custody and Field Documentation			
Signed	✓	C-O-C	
Unique Sample ID	✓	"	
Complete	✓	"	
4. Analytical Procedures			
Laboratory Name: American West Analytical			
Analytical Method/Extraction Dates/Holding Times			
Metals	✓ / ✓ / ✓	Lab Rpt	All
VOA	✓ / ✓ / ✓		reported
BNAP*	✓ / ✓ / ✓		within 10 days
Pesticides			
Other Explosives	✓ / ✓ / ✓		
Detection Limits			
Metals	✓		
VOA	✓		
BNAP	✓		
Pesticides			
Other Explosives	✓		
5. Laboratory QA/QC			
Certification	✓		
Spikes	✓		
Duplicates Spike Dup	✓		QA good
Blanks ~~VOC, SVOC, Explosives only~~	✓		
Surrogates	NA		
6. Field QA/QC Procedures			
Decontamination	✓		
Screening Instrument Calibrations	NA		
Collection Procedures	✓		
Sample Preservation	None		
Sample Transport		COC	
Duplicates SS12 & 25, SS20 & 26	✓		Dup. Prec. low for some metals
Background Samples	NOT ON THIS TICKET		

* BNAP - Base/neutral-acid semivolatile organic pollutants.

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG - 59304 through 06, 593S09 to S21, 593 SS27 to SS32	Lab Report No.	L14002
Sample Date	May 5, 1993	Chain-of-Custody No.	423 & 424
Sample Location	Various - See Samp Log	Reviewed By:	RDE
Sample Depth	Various - See Samp Log	Review Date:	~~8~~ 7/26

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	Sample Log Field Notes	
Field Screening	NA		
2. Locations and Description of Activities			
Maps - Location Identification	✓	Surveyor Map	
Boring Logs - Sample Depth	✓	Notes	
Screening Technique	NA		
3. Chain-of-Custody and Field Documentation			
Signed	✓	C-o-C	
Unique Sample ID	✓	↓	
Complete	✓	↓	
4. Analytical Procedures			
Laboratory Name: American West Anal. Lab			
Analytical Method/Extraction Dates/Holding Times			
Metals	✓ | ✓ | ✓	Lab Rpt	All analyzed within 13 days
VOA	✓ | ✓ | ✓	↓	
BNAP*	✓ | ✓ | ✓	↓	
Pesticides	NA	↓	
Other: Explos	✓ | ✓ | ✓	↓	
Detection Limits			
Metals	✓	↓	
VOA	✓	↓	
BNAP	✓	↓	
Pesticides	NA	↓	
Other: Explos	✓	↓	
5. Laboratory QA/QC			
Certification	✓		
Spikes	✓		QC good
Duplicates: Spikes	✓		arsenic recoveries may decrease over run
Blanks: ~~VOC, SVOC, exp. only~~	✓		
Surrogates	NA		
6. Field QA/QC Procedures			
Decontamination	✓		
Screening Instrument Calibrations	NA		
Collection Procedures	✓		
Sample Preservation: blanks only	~~NA~~ ✓		
Sample Transport	✓		
Duplicates: SS30 & SS31, S09 & S10			Chromium ~~Metals~~ on SS30 & SS31 18 & 14 respect. All other good
Background Samples	✓		

* BNAP - Base/neutral-acid semivolatile organic pollutants.

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG593327 to DPG593342	Lab Report No.	L14141
Sample Date	5/17/93 and 5/18/93	Chain-of-Custody No.	364 & 365
Sample Location	various	Reviewed By:	RDZ
Sample Depth	various	Review Date:	7/26

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	Sample Logs	
Field Screening	N/A		
2. Locations and Description of Activities			
Maps - Location Identification	✓	Surveyor map	
Boring Logs - Sample Depth	✓	Sample Log	
Screening Technique	N/A		
3. Chain-of-Custody and Field Documentation			
Signed	✓	C-O-C	
Unique Sample ID	✓	✓	
Complete	✓	✓	
4. Analytical Procedures			
Laboratory Name: American West			
Analytical Method/Extraction Dates/Holding Times			
Metals	✓ ✓ ✓	Lab Rpts	Complete
VOA	NA		
BNAP*	NA		within
Pesticides	NA		
Other Explos	✓ ✓ ✓	✓	9 days
Detection Limits			
Metals	✓		
VOA	NA		
BNAP	NA		
Pesticides	NA		
Other Exp.	✓	✓	
5. Laboratory QA/QC			
Certification	?		
Spikes	✓		
Duplicates Spikes	✓		
Blanks ~~Explosives Only~~	✓		
Surrogates		✓	
6. Field QA/QC Procedures			
Decontamination	✓	field notes	
Screening Instrument Calibrations	NA		
Collection Procedures	✓		
Sample Preservation blanks only	✓		
Sample Transport	✓		
Duplicates None on this group			
Background Samples None " " "		✓	

* BNAP - Base/neutral-acid semivolatile organic pollutants.

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG593543 thru 548	Lab Report No.	14247
Sample Date	~~[illegible]~~ 5/24 to 5/26	Chain-of-Custody No.	361
Sample Location	var.	Reviewed By:	RDB
Sample Depth	var.	Review Date:	7/26

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified		Sample ID Log	
Sampling	✓	Field Notes	
Field Screening	N/A		
2. Locations and Description of Activities			
Maps - Location Identification	✓	Survey Map	
Boring Logs - Sample Depth	✓	Sample ID Log	
Screening Technique	NA		
3. Chain-of-Custody and Field Documentation			
Signed	✓	COC	
Unique Sample ID	✓		
Complete	✓		
4. Analytical Procedures			
Laboratory Name American West Anal. Lab			
Analytical Method/Extraction Dates/Holding Times			Lab added Nitroglycerine
Metals	✓ ✓ ✓	Lab	w/in. 19 days
VOA	✓ ✓ ✓	Rpt	w/in [illegible] 5 days
BNAP*	✓ ✓ ✓		w/in 13 days
Pesticides			
Other Expl.	✓ ✓ ✓		w/in 5 days
Detection Limits			
Metals	✓		
VOA	✓		
BNAP	✓		
Pesticides			
Other Expl.	✓		
5. Laboratory QA/QC			
Certification	✓		Alchohols
Spikes	✓		may
Duplicates Spike	✓		have low
Blanks ~~[illegible]~~	✓		<10% recoveries
Surrogates	NA		
6. Field QA/QC Procedures			
Decontamination	✓		
Screening Instrument Calibrations	NA		
Collection Procedures	✓		Note water
Sample Preservation water only ~~[illegible]~~	✓		samples bailed
Sample Transport	✓		from boring,
Duplicates 547 & 548 dups, not collect. accord to prot.			not were
Background Samples None			as
			specified
			in Scope

* BNAP - Base/neutral-acid semivolatile organic pollutants.

duplicate. qualifier

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG593549 to DPG593556	Lab Report No.	L14298
Sample Date	~~[illegible]~~ May 27 93	Chain-of-Custody No.	468
Sample Location	Var	Reviewed By:	RDZ
Sample Depth	Var	Review Date:	7/26

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	Samp Log	
Field Screening	N/A		
2. Locations and Description of Activities			
Maps - Location Identification	✓	Survey Map	
Boring Logs - Sample Depth	✓	Samp Log	
Screening Technique	N/A		
3. Chain-of-Custody and Field Documentation			
Signed	✓	COC	
Unique Sample ID	✓		
Complete	✓		
4. Analytical Procedures			
Laboratory Name: American West An. Lab		Lab Rpts	
Analytical Method/Extraction Dates/Holding Times			
Metals	✓ ✓ ✓	✓	Explos within 7 days
VOA			
BNAP*			Metals w/in 13 days
Pesticides			
Other Expl.	✓ ✓ ✓		
Detection Limits			
Metals	✓	✓	
VOA			
BNAP			
Pesticides			
Other Exp	✓		
5. Laboratory QA/QC			
Certification	✓	✓	
Spikes	✓		
Duplicates Spike	✓		Good
Blanks ~~[illegible]~~ only	~~[illegible]~~ ✓		
Surrogates	NA		
6. Field QA/QC Procedures			
Decontamination	✓	Field notes	Field & Rinsate
Screening Instrument Calibrations	N/A	✓	Blanks have
Collection Procedures	✓		low Ba
Sample Preservation	✓		Trip Blank ND
Sample Transport	✓		
Duplicates	None		
Background Samples	Not on this ticket		

* BNAP - Base/neutral-acid semivolatile organic pollutants.

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DP6 693-557 thru 564	Lab Report No.	L14335
Sample Date	6/01 to 6/03/93	Chain-of-Custody No.	475
Sample Location	var	Reviewed By:	RDZ
Sample Depth	var	Review Date:	7/26

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	Sample Log	
Field Screening	N/A		
2. Locations and Description of Activities			
Maps - Location Identification	✓	Surveyor Map	
Boring Logs - Sample Depth	✓	Sample Log	
Screening Technique	N/A		
3. Chain-of-Custody and Field Documentation			
Signed	✓	COC	
Unique Sample ID	✓	↓	
Complete	✓	↓	
4. Analytical Procedures			
Laboratory Name: American West			
Analytical Method/Extraction Dates/Holding Times			
Metals	✓ ✓ ✓	Lab Rpt	Exp w/in 7 days
VOA			
BNAP*			
Pesticides			Metals w/in
Other Exp	✓ ✓ ✓		14 days
Detection Limits			
Metals	✓		
VOA	NA		
BNAP	NA		
Pesticides	NA		
Other Exp.	✓		
5. Laboratory QA/QC			
Certification	✓		
Spikes	✓		Recoveries for
Duplicates	✓		Hg/Se/RDX
Blanks ~~Exp~~	✓		in the 70's
Surrogates	N/A	↓	
6. Field QA/QC Procedures			
Decontamination	✓	Field Notes	Trip, Rinsate
Screening Instrument Calibrations	N/A		and Field Blanks
Collection Procedures	✓		clean
Sample Preservation	✓		
Sample Transport	✓	↓	
Duplicates	None		
Background Samples	None		

* BNAP - Base/neutral-acid semivolatile organic pollutants.

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG 693 S 65 THROUGH DPG 693 S70	Lab Report No.	L 14359
Sample Date	June 4, 1993	Chain-of-Custody No.	474
Sample Location	B-2 and B-4	Reviewed By:	J. Carson
Sample Depth	VARIOUS	Review Date:	July 27, 1993

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	CONTROL LOG	ALL ON JUNE 4, 1993
Field Screening	NA		
2. Locations and Description of Activities			
Maps - Location Identification	✓	SURVEYORS MAP	
Boring Logs - Sample Depth	✓	BORING LOGS	
Screening Technique	NA		
3. Chain-of-Custody and Field Documentation			
Signed	✓	Chain of Cust	
Unique Sample ID	✓		
Complete	✓		
4. Analytical Procedures			
Laboratory Name: American West Analytical			
Analytical Method/Extraction Dates/Holding Times			
Metals: VARIOUS ✓ / JUNE 8 ✓	✓	LAB RPTS	
VOA			
BNAP*			
Pesticides			
Other: EXPLOSIVES ✓ / JUNE 8 ✓	✓	LAB RPTS	ANALYSED 7 DAYS AFTER COLLECTION
Detection Limits			
Metals	✓	LAB RPTS	
VOA			
BNAP			
Pesticides			
Other: EXPLOSIVES	✓	LAB RPTS	
5. Laboratory QA/QC			
Certification	✓	LAB QA RPT	QA LOW ON AS, Se
Spikes	✓		
Duplicates: SPIKE DUPES	✓		
Blanks	✓		TRIP, FIELD, RINSATE
Surrogates	NA		
6. Field QA/QC Procedures			
Decontamination	✓	SAMPLE PLAN FIELD NOTES	
Screening Instrument Calibrations	NA		
Collection Procedures	✓		
Sample Preservation	✓		
Sample Transport	✓		
Duplicates	NA		NONE IN SET
Background Samples	NA		"

* BNAP - Base/neutral-acid semivolatile organic pollutants.

saadt

DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG 693571 through DPG 693 579	Lab Report No.	L 14368
Sample Date	June 8, 1993	Chain-of-Custody No.	380
Sample Location	Boring B-8	Reviewed By:	J. Carson
Sample Depth	various depths	Review Date:	27 July 93

Criteria			Verification Available	Reference	Comments
1. Activity Dates Identified				CHAIN OF CUST.	
Sampling			✓	SAMPLE CONTROL LOG	
Field Screening			NA		
2. Locations and Description of Activities					
Maps - Location Identification			✓	SURVEYORS MAP/NOTES	
Boring Logs - Sample Depth			✓	BORING LOGS	
Screening Technique			NA		
3. Chain-of-Custody and Field Documentation					
Signed			✓	chain of Cust.	
Unique Sample ID			✓	control log	
Complete			✓	chain of Cust	
4. Analytical Procedures					
Laboratory Name: American West Analytical labs					
Analytical Method/Extraction Dates/Holding Times					
Metals various ✓	✓		✓	LAB REPORTS	Extracted 2 days after sample
VOA ✓	✓		✓		Analysed 3 days after sample
BNAP* ✓	✓		✓		" 1 day " "
Pesticides					
Other explosives ✓	✓		✓		Analysed 4 days after sample
Detection Limits					
Metals			✓	LAB REPORT	
VOA			✓		
BNAP			✓		
Pesticides					
Other			✓		
5. Laboratory QA/QC				CONTROL LOG	
Certification			✓	LAB REPORT	
Spikes			✓		
Duplicates SPIKE DUPES.			✓		[redacted]
Blanks FIELD, TRIP, RINSATE			✓		
Surrogates			NA		
6. Field QA/QC Procedures					
Decontamination			✓	SAMPLING PLAN	
Screening Instrument Calibrations			NA		
Collection Procedures			✓	SAMPLE PLAN/FLD NOTES	
Sample Preservation VOA & SEMI			✓		
Sample Transport			✓		
Duplicates			✓		DPG693572 & DPG693573
Background Samples			NA		NOT IN THIS SET

* BNAP - Base/neutral-acid semivolatile organic pollutants.

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DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG 593 -07 AND DPG 593-08 DPG 593 S22 THROUGH DPG 593 S26	Lab Report No.	L 14394
Sample Date	MAY 6, 1993	Chain-of-Custody No.	473
Sample Location	VARIOUS	Reviewed By:	J. Carson
Sample Depth	VARIOUS	Review Date:	July 26, 1993

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified			
Sampling	✓	SAMPLE CONTROL LOG	
Field Screening	NA		
2. Locations and Description of Activities			
Maps - Location Identification	✓	SURVEYOR MAP AND NOTES	
Boring Logs - Sample Depth	✓	LOGS & CONTROL LOGS	
Screening Technique	NA		
3. Chain-of-Custody and Field Documentation			
Signed	✓	CHAIN OF CUSTODY	
Unique Sample ID	✓	CONTROL LOGS	
Complete	✓	CHAIN OF CUSTODY	
4. Analytical Procedures			
Laboratory Name AMERICAN WEST ANALYTICAL LABS			
Analytical Method/Extraction Dates/Holding Times			
Metals ✓ | ✓ | ✓			All samples analysed 36 days after collection
VOA			
BNAP*			
Pesticides			
Other EXPLOSIVES ✓ | ✓ | ✓			
Detection Limits			
Metals VARIOUS	✓	LAB REPORT	
VOA			
BNAP			
Pesticides			
Other EXPLOSIVES VARIOUS	✓	LAB REPORT	
5. Laboratory QA/QC			
Certification	✓	LAB RPT	
Spikes	✓		
Duplicates SPIKE DUPLICATES / DPG593 S-24 & S25	✓		SOIL SAMPLE DUPES.
Blanks	✓		FIELD, RINSATE BLANKS
Surrogates	NA		BLANKS CONTAIN Br
6. Field QA/QC Procedures			
Decontamination	✓	SAMPLE PLAN	
Screening Instrument Calibrations	NA		
Collection Procedures	✓	SAMPLE PLAN	
Sample Preservation	✓		
Sample Transport	✓		
Duplicates DPG 593 S24 and DPG 593 S25	✓		
Background Samples NOT IN THIS SET	NA		

* BNAP - Base/neutral-acid semivolatile organic pollutants.

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DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG693580 THROUGH DPG693588 DPG693590 AND DPG693591	Lab Report No.	L14504
Sample Date	6/10/93, 6/18/93 and 6/19/93	Chain-of-Custody No.	377 & 379
Sample Location	BORING B8W and B-6W	Reviewed By:	J. Carson
Sample Depth	VARIOUS	Review Date:	26 July 93

Criteria	Verification Available			Reference	Comments
1. Activity Dates Identified					
Sampling			✓	CONTROL LOG FIELD NOTES	
Field Screening			N/A		
2. Locations and Description of Activities					
Maps - Location Identification			✓	SURVEYORS MAP SURVEYORS NOTES	
Boring Logs - Sample Depth			✓	BORING LOGS	
Screening Technique			NA		
3. Chain-of-Custody and Field Documentation					
Signed			✓	CHAIN OF CUSTODY	COC'S BOTH COMPLETE
Unique Sample ID			✓	"	"
Complete			✓	"	"
4. Analytical Procedures					
Laboratory Name: AMERICAN WEST ANALYTICAL					
Analytical Method/Extraction Dates/Holding Times					
Metals VARIOUS	✓	✓	✓	LAB REPORT	ANALYZED AFTER DPG693580 HOLD TIME 12 DAYS
VOA	✓	✓	✓	LAB REPORT	
BNAP*	✓	✓	✓	LAB REPORT	
Pesticides					
Other EXPLOSIVES	✓	✓	✓	LAB REPORT	
Detection Limits					
Metals			✓	LAB REPORT	
VOA			✓	LAB REPORT	
BNAP			✓	LAB REPORT	
Pesticides					
Other Explosives			✓	LAB REPORT	
5. Laboratory QA/QC					
Certification			✓	LAB REPORT	
Spikes			✓		
Duplicates SPIKE DUPS			✓		
Blanks ~~METALS & EXPLOSIVES~~			✓	CONTROL LOG	TRIP, FIELD, RINSATE
Surrogates			NA		Blanks contain Ba Trip blank also As
6. Field QA/QC Procedures					
Decontamination			✓	SAMPLE PLAN	
Screening Instrument Calibrations			NA		
Collection Procedures			✓	FIELD LOGS	
Sample Preservation			✓		
Sample Transport			✓	C.O.C.	
Duplicates			NA		
Background Samples			NA		NONE THIS SET

* BNAP - Base/neutral-acid semivolatile organic pollutants.

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DATA VALIDATION SHEET: SOIL SAMPLES

Sample Number	DPG 62893501 THRU 505	Lab Report No.	L14637
Sample Date	JUNE 24, 1993 & JUNE 28, 1993	Chain-of-Custody No.	470
Sample Location	MONITOR WELLS AT B-7, B-6 & B-8	Reviewed By:	JGC
Sample Depth	VARIOUS DEPTHS	Review Date:	26 JULY 93

Criteria	Verification Available	Reference	Comments
1. Activity Dates Identified		sample control log	
Sampling	✓		
Field Screening	NA		
2. Locations and Description of Activities		SURVEYORS NOTES	
Maps - Location Identification	✓	SURVEY MAP	
Boring Logs - Sample Depth	✓	Field Notes	
Screening Technique	NA		
3. Chain-of-Custody and Field Documentation			
Signed	✓	Chain of Custody	
Unique Sample ID	✓	"	
Complete	✓	"	
4. Analytical Procedures			
Laboratory Name American West Analytical Labs			
Analytical Method/Extraction Dates/Holding Times			
Metals	✓ / ✓ / ✓	LAB REPORT	
VOA			
BNAP*			
Pesticides			
Other Explosives	✓ / ✓ / ✓	LAB REPORT	
Detection Limits			
Metals	✓	LAB REPORT	
VOA			
BNAP			
Pesticides			
Other Explosives	✓	LAB REPORT	
5. Laboratory QA/QC			
Certification	✓	LAB RPT	
Spikes	✓	LAB RPT	QA GOOD
Duplicates SPIKE DUPLICATE	✓	LAB RPT	
Blanks Explosives - metals	✓	LAB RPT	FIELD & TRIP BLANKS
Surrogates	NA		Blanks contain reportable Ba, Ca, Cr
6. Field QA/QC Procedures			
Decontamination	✓	FIELD NOTES/SAMPLE PLAN	
Screening Instrument Calibrations	NA		
Collection Procedures	✓		
Sample Preservation	✓		
Sample Transport	✓		
Duplicates	NA		
Background Samples	NA		NO BACKGROUND FOR WATER

* BNAP - Base/neutral-acid semivolatile organic pollutants.

saadt

Front

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
L13991-1		DPG59301		03-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:30-OCT-93			
Water	C	AS	Arsenic	Expires:30-OCT-93			
Water	C	BA	Barium	Expires:30-OCT-93			
Water	C	CD	Cadmium	Expires:30-OCT-93			
Water	C	CR	Chromium	Expires:30-OCT-93			
Water	C	HG	Mercury	Expires:30-OCT-93			
Water	C	PB	Lead	Expires:30-OCT-93			
Water	C	SE	Selenium	Expires:30-OCT-93			
Water	S	DIG-MET	Total Metal Digestion	Expires:30-OCT-93	may 5		1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:17-MAY-93	may 5		1 Contain
Water	S	QC 1	Level 1 QC Package				
L13991-2		DPG59302		03-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:30-OCT-93			
Water	C	AS	Arsenic	Expires:30-OCT-93			
Water	C	BA	Barium	Expires:30-OCT-93			
Water	C	CD	Cadmium	Expires:30-OCT-93			
Water	C	CR	Chromium	Expires:30-OCT-93			
Water	C	HG	Mercury	Expires:30-OCT-93			
ter	C	PB	Lead	Expires:30-OCT-93			
er	C	SE	Selenium	Expires:30-OCT-93			
er	S	DIG-MET	Total Metal Digestion	Expires:30-OCT-93	may 5		1 Contain
ter	S	EXP-CYC	Cyclic Explosives	Expires:17-MAY-93	may 5		1 Contain
er	S	QC I	Level I QC Package				
L13991-3		DPG59303		03-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:30-OCT-93			
Water	C	AS	Arsenic	Expires:30-OCT-93			
Water	C	BA	Barium	Expires:30-OCT-93			
Water	C	CD	Cadmium	Expires:30-OCT-93			
Water	C	CR	Chromium	Expires:30-OCT-93			
Water	C	HG	Mercury	Expires:30-OCT-93			
Water	C	PB	Lead	Expires:30-OCT-93			
Water	C	SE	Selenium	Expires:30-OCT-93			
Water	S	DIG-MET	Total Metal Digestion	Expires:30-OCT-93	may 5		1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:17-MAY-93	may 5		1 Contain
Water	S	QC 1	Level 1 QC Package				
L13991-4		DPG593 S01		03-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:30-OCT-93			
Solids	C	AS	Arsenic	Expires:30-OCT-93			
Solids	C	BA	Barium	Expires:30-OCT-93			
Solids	C	CD	Cadmium	Expires:30-OCT-93			
Solids	C	CR	Chromium	Expires:30-OCT-93			
Solids	C	HG	Mercury	Expires:30-OCT-93			
Solids	C	PB	Lead	Expires:30-OCT-93			
Solids	C	SE	Selenium	Expires:30-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:30-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:17-MAY-93	may 5		1 Contain
Solids	S	QC !	Level ! QC Package				

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date		Due PR Date	
L13991-5		DPG593 S02		03-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:30-OCT-93				
Solids	C	AS	Arsenic	Expires:30-OCT-93				
Solids	C	BA	Barium	Expires:30-OCT-93				
Solids	C	CD	Cadmium	Expires:30-OCT-93				
Solids	C	CR	Chromium	Expires:30-OCT-93				
Solids	C	HG	Mercury	Expires:30-OCT-93				
Solids	C	PB	Lead	Expires:30-OCT-93				
Solids	C	SE	Selenium	Expires:30-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:30-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:17-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					
L13991-6		DPG593 S06 (-1 & -5)		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Composite these two jars before analyzing; Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
olids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
olids	S	QC I	Level I QC Package					
L13991-7		DPG593 S07 (-1 & -5)		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Composite these two jars before analyzing; Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					
L13991-8		DPG593 S08 (-1 & -5)		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Composite these two jars before analyzing; Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
L13991-9		DPG593 SS01		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					
L13991-10		DPG593 SS02		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Share sample--Jerry & semis; Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
'ids	C	PB	Lead	Expires:31-OCT-93				
ds	C	SE	Selenium	Expires:31-OCT-93				
.ids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
ids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
ids	S	QC I	Level I QC Package					
olids	S	SEMI-F&D	F&D list semivolatiles	Expires:11-MAY-93				
Solids	S	VOC-F&D	F&D list volatiles	Expires:18-MAY-93	jerry			1 Contain
L13991-11		DPG593 SS03		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Water	S	QC I	Level I QC Package					
L13991-12		DPG593 SS04		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

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Laboratory          Client
Sample Number       Sample Number  Method Description                       Collect   Receive      Due
                                                                            Date      Date      PR Date
---------------------------------------------------------------------------------------------------------------
Solids      S  QC I                Level I QC Package

L13991-13            DPG593 SS05                                            04-MAY-93 05-MAY-93 PA 14-MAY-93
Level 1 QC; Explosives are HMX, RDX, TNT & DNT
Solids      P  D LIST METALS       8 RCRA
Solids      C   AG                 Silver                      Expires:31-OCT-93
Solids      C   AS                 Arsenic                     Expires:31-OCT-93
Solids      C   BA                 Barium                      Expires:31-OCT-93
Solids      C   CD                 Cadmium                     Expires:31-OCT-93
Solids      C   CR                 Chromium                    Expires:31-OCT-93
Solids      C   HG                 Mercury                     Expires:31-OCT-93
Solids      C   PB                 Lead                        Expires:31-OCT-93
Solids      C   SE                 Selenium                    Expires:31-OCT-93
Solids      S  DIG-MET             Total Metal Digestion       Expires:31-OCT-93  may 5             1 Contain
Solids      S  EXP-CYC             Cyclic Explosives           Expires:18-MAY-93  may 5             1 Contain
Solids      S  QC I                Level I QC Package

L13991-14            DPG593 SS06                                            04-MAY-93 05-MAY-93 PA 14-MAY-93
Level 1 QC; Explosives are HMX, RDX, TNT & DNT
Solids      P  D LIST METALS       8 RCRA
Solids      C   AG                 Silver                      Expires:31-OCT-93
Solids      C   AS                 Arsenic                     Expires:31-OCT-93
Solids      C   BA                 Barium                      Expires:31-OCT-93
Solids      C   CD                 Cadmium                     Expires:31-OCT-93
Solids      C   CR                 Chromium                    Expires:31-OCT-93
Solids      C   HG                 Mercury                     Expires:31-OCT-93
Solids      C   PB                 Lead                        Expires:31-OCT-93
 olids      C   SE                 Selenium                    Expires:31-OCT-93
 olids      S  DIG-MET             Total Metal Digestion       Expires:31-OCT-93  may 5             1 Contain
Solids      S  EXP-CYC             Cyclic Explosives           Expires:18-MAY-93  may 5             1 Contain
Solids      S  QC I                Level I QC Package

L13991-15            DPG593 SS07                                            04-MAY-93 05-MAY-93 PA 14-MAY-93
Level 1 QC; Explosives are HMX, RDX, TNT & DNT
Solids      P  D LIST METALS       8 RCRA
Solids      C   AG                 Silver                      Expires:31-OCT-93
Solids      C   AS                 Arsenic                     Expires:31-OCT-93
Solids      C   BA                 Barium                      Expires:31-OCT-93
Solids      C   CD                 Cadmium                     Expires:31-OCT-93
Solids      C   CR                 Chromium                    Expires:31-OCT-93
Solids      C   HG                 Mercury                     Expires:31-OCT-93
Solids      C   PB                 Lead                        Expires:31-OCT-93
Solids      C   SE                 Selenium                    Expires:31-OCT-93
Solids      S  DIG-MET             Total Metal Digestion       Expires:31-OCT-93  may 5             1 Contain
Solids      S  EXP-CYC             Cyclic Explosives           Expires:18-MAY-93  may 5             1 Contain
Solids      S  QC I                Level I QC Package

L13991-16            DPG593 SS08                                            04-MAY-93 05-MAY-93 PA 14-MAY-93
Level 1 QC; Explosives are HMX, RDX, TNT & DNT
Solids      P  D LIST METALS       8 RCRA
Solids      C   AG                 Silver                      Expires:31-OCT-93
Solids      C   AS                 Arsenic                     Expires:31-OCT-93
Solids      C   BA                 Barium                      Expires:31-OCT-93
Solids      C   CD                 Cadmium                     Expires:31-OCT-93
Solids      C   CR                 Chromium                    Expires:31-OCT-93
Solids      C   HG                 Mercury                     Expires:31-OCT-93
Solids      C   PB                 Lead                        Expires:31-OCT-93
Solids      C   SE                 Selenium                    Expires:31-OCT-93
Solids      S  DIG-MET             Total Metal Digestion       Expires:31-OCT-93  may 5             1 Contain
Solids      S  EXP-CYC             Cyclic Explosives           Expires:18-MAY-93  may 5             1 Contain
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LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
Solids	S	QC I	Level I QC Package				
L13991-17		DPG593 SS09		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-18		DPG593 SS10		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-19		DPG593 SS11		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-20		DPG593 SS12		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description		Collect Date	Receive Date	PR	Due Date	
Solids	S	QC I	Level I QC Package						
L13991-21		DPG593 SS13			04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT									
Solids	P	D LIST METALS	8 RCRA						
Solids	C	AG	Silver	Expires:31-OCT-93					
Solids	C	AS	Arsenic	Expires:31-OCT-93					
Solids	C	BA	Barium	Expires:31-OCT-93					
Solids	C	CD	Cadmium	Expires:31-OCT-93					
Solids	C	CR	Chromium	Expires:31-OCT-93					
Solids	C	HG	Mercury	Expires:31-OCT-93					
Solids	C	PB	Lead	Expires:31-OCT-93					
Solids	C	SE	Selenium	Expires:31-OCT-93					
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5				1 Contain
Solids	S	QC I	Level I QC Package						
L13991-22		DPG593 SS14			04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT									
Solids	P	D LIST METALS	8 RCRA						
Solids	C	AG	Silver	Expires:31-OCT-93					
Solids	C	AS	Arsenic	Expires:31-OCT-93					
Solids	C	BA	Barium	Expires:31-OCT-93					
Solids	C	CD	Cadmium	Expires:31-OCT-93					
Solids	C	CR	Chromium	Expires:31-OCT-93					
Solids	C	HG	Mercury	Expires:31-OCT-93					
Solids	C	PB	Lead	Expires:31-OCT-93					
Solids	C	SE	Selenium	Expires:31-OCT-93					
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5				1 Contain
Solids	S	QC I	Level I QC Package						
L13991-23		DPG593 SS15			04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT									
Solids	P	D LIST METALS	8 RCRA						
Solids	C	AG	Silver	Expires:31-OCT-93					
Solids	C	AS	Arsenic	Expires:31-OCT-93					
Solids	C	BA	Barium	Expires:31-OCT-93					
Solids	C	CD	Cadmium	Expires:31-OCT-93					
Solids	C	CR	Chromium	Expires:31-OCT-93					
Solids	C	HG	Mercury	Expires:31-OCT-93					
Solids	C	PB	Lead	Expires:31-OCT-93					
Solids	C	SE	Selenium	Expires:31-OCT-93					
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5				1 Contain
Solids	S	QC I	Level I QC Package						
L13991-24		DPG593 SS16			04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT									
Solids	P	D LIST METALS	8 RCRA						
Solids	C	AG	Silver	Expires:31-OCT-93					
Solids	C	AS	Arsenic	Expires:31-OCT-93					
Solids	C	BA	Barium	Expires:31-OCT-93					
Solids	C	CD	Cadmium	Expires:31-OCT-93					
Solids	C	CR	Chromium	Expires:31-OCT-93					
Solids	C	HG	Mercury	Expires:31-OCT-93					
Solids	C	PB	Lead	Expires:31-OCT-93					
Solids	C	SE	Selenium	Expires:31-OCT-93					
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5				1 Contain

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
Solids	S QC I	Level I QC Package				
L13991-25	DPG593 SS17		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Share sample--Jerry & semis; Level 1 QC; Explosives are HMX, RDX, TNT & DNT						
Solids	P D LIST METALS	8 RCRA				
Solids	C AG	Silver	Expires:31-OCT-93			
Solids	C AS	Arsenic	Expires:31-OCT-93			
Solids	C BA	Barium	Expires:31-OCT-93			
Solids	C CD	Cadmium	Expires:31-OCT-93			
Solids	C CR	Chromium	Expires:31-OCT-93			
Solids	C HG	Mercury	Expires:31-OCT-93			
Solids	C PB	Lead	Expires:31-OCT-93			
Solids	C SE	Selenium	Expires:31-OCT-93			
Solids	S DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S QC I	Level I QC Package				
Solids	S SEMI-F&D	F&D list semivolatiles	Expires:11-MAY-93			
Solids	S VOC-F&D	F&D list volatiles	Expires:18-MAY-93	jerry		1 Contain
L13991-26	DPG593 SS18		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT						
Solids	P D LIST METALS	8 RCRA				
Solids	C AG	Silver	Expires:31-OCT-93			
Solids	C AS	Arsenic	Expires:31-OCT-93			
Solids	C BA	Barium	Expires:31-OCT-93			
Solids	C CD	Cadmium	Expires:31-OCT-93			
Solids	C CR	Chromium	Expires:31-OCT-93			
Solids	C HG	Mercury	Expires:31-OCT-93			
Solids	C PB	Lead	Expires:31-OCT-93			
Solids	C SE	Selenium	Expires:31-OCT-93			
Solids	S DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S QC I	Level I QC Package				
L13991-27	DPG593 SS19		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT						
Solids	P D LIST METALS	8 RCRA				
Solids	C AG	Silver	Expires:31-OCT-93			
Solids	C AS	Arsenic	Expires:31-OCT-93			
Solids	C BA	Barium	Expires:31-OCT-93			
Solids	C CD	Cadmium	Expires:31-OCT-93			
Solids	C CR	Chromium	Expires:31-OCT-93			
Solids	C HG	Mercury	Expires:31-OCT-93			
Solids	C PB	Lead	Expires:31-OCT-93			
Solids	C SE	Selenium	Expires:31-OCT-93			
Solids	S DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S QC I	Level I QC Package				
L13991-28	DPG593 SS20		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT						
Solids	P D LIST METALS	8 RCRA				
Solids	C AG	Silver	Expires:31-OCT-93			
Solids	C AS	Arsenic	Expires:31-OCT-93			
Solids	C BA	Barium	Expires:31-OCT-93			
Solids	C CD	Cadmium	Expires:31-OCT-93			
Solids	C CR	Chromium	Expires:31-OCT-93			
Solids	C HG	Mercury	Expires:31-OCT-93			
Solids	C PB	Lead	Expires:31-OCT-93			
Solids	C SE	Selenium	Expires:31-OCT-93			

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 05 1993, 10:35 am

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-29		DPG593 SS21		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-30		DPG593 SS22		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-31		DPG593 SS23		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5		1 Contain
Solids	S	QC I	Level I QC Package				
L13991-32		DPG593 SS24		04-MAY-93	05-MAY-93	PA 14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:31-OCT-93			
Solids	C	AS	Arsenic	Expires:31-OCT-93			
Solids	C	BA	Barium	Expires:31-OCT-93			
Solids	C	CD	Cadmium	Expires:31-OCT-93			
Solids	C	CR	Chromium	Expires:31-OCT-93			
Solids	C	HG	Mercury	Expires:31-OCT-93			
Solids	C	PB	Lead	Expires:31-OCT-93			
Solids	C	SE	Selenium	Expires:31-OCT-93			

Login Number: L13991
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
Solids	S	DIG-MET	Tqtal Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					
L13991-33		DPG593 SS25		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					
L13991-34		DPG593 SS26		04-MAY-93	05-MAY-93	PA	14-MAY-93	
Level 1 QC; Explosives are HMX, RDX, TNT & DNT								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:31-OCT-93				
Solids	C	AS	Arsenic	Expires:31-OCT-93				
Solids	C	BA	Barium	Expires:31-OCT-93				
Solids	C	CD	Cadmium	Expires:31-OCT-93				
Solids	C	CR	Chromium	Expires:31-OCT-93				
Solids	C	HG	Mercury	Expires:31-OCT-93				
Solids	C	PB	Lead	Expires:31-OCT-93				
Solids	C	SE	Selenium	Expires:31-OCT-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:31-OCT-93	may 5			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:18-MAY-93	may 5			1 Contain
Solids	S	QC I	Level I QC Package					

Signature: ______________________________

Date: ______________________________

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	**0.008**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

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Report Date 7/28/93

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-01
Field Sample ID: Project #30-2025-15.001 / DPG593 01 W

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.004
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Report Date 5/13/93

INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-02
Field Sample ID: Project #30-2025-15.001 / DPG593 02 W

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.003
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-03
Field Sample ID: Project #30-2025-15.001 / DPG593 03 W

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.004**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

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Report Date 7/28/93

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-04
Field Sample ID: Project #30-2025-15.001 / DPG593 S01

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.7
Barium	6010	0.5	130.
Cadmium	6010	0.2	2.8
Chromium	6010	0.5	9.3
Lead	6010	3.0	5.3
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.0

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INORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-05
Field Sample ID: Project #30-2025-15.001 / DPG593 S02

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.4
Barium	6010	0.5	170.
Cadmium	6010	0.2	3.6
Chromium	6010	0.5	12.
Lead	6010	3.0	9.3
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.9

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INORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-06
Field Sample ID: Project #30-2025-15.001 / DPG593 S06 (-1 and -5)

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	7.0
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	11.
Lead	6010	3.0	7.8
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.3

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INORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-07
Field Sample ID: Project #30-2025-15.001 / DPG593 S07 (-1 and -5)

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	7.3
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.1
Chromium	6010	0.5	10.
Lead	6010	3.0	8.8
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.6

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-08
Field Sample ID: Project #30-2025-15.001 / DPG593 S08 (-1 and -5)

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.9
Barium	6010	0.5	140.
Cadmium	6010	0.2	3.8
Chromium	6010	0.5	12.
Lead	6010	3.0	9.4
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.4

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-09
Field Sample ID: Project #30-2025-15.001 / DPG593 SS01

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**6.9**
Barium	6010	0.5	**180.**
Cadmium	6010	0.2	**4.1**
Chromium	6010	0.5	**13.**
Lead	6010	3.0	**12.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.8**

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-10
Field Sample ID: Project #30-2025-15.001 / DPG593 SS02

Contact: Renee Zollinger
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Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.0
Barium	6010	0.5	160.
Cadmium	6010	0.2	3.6
Chromium	6010	0.5	12.
Lead	6010	3.0	10.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.9

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Report Date 5/13/93

INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-11
Field Sample ID: Project #30-2025-15.001 / DPG593 SS03

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	6.6
Barium	6010	0.5	300.
Cadmium	6010	0.2	7.4
Chromium	6010	0.5	22.
Lead	6010	3.0	29.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.6

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-12
Field Sample ID: Project #30-2025-15.001 / DPG593 SS04

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.6
Barium	6010	0.5	160.
Cadmium	6010	0.2	3.6
Chromium	6010	0.5	12.
Lead	6010	3.0	7.3
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.7

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INORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-13
Field Sample ID: Project #30-2025-15.001 / DPG593 SS05

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.8
Barium	6010	0.5	160.
Cadmium	6010	0.2	3.7
Chromium	6010	0.5	12.
Lead	6010	3.0	24.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.9

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-14
Field Sample ID: Project #30-2025-15.001 / DPG593 SS06

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.0
Barium	6010	0.5	160.
Cadmium	6010	0.2	3.6
Chromium	6010	0.5	12.
Lead	6010	3.0	8.7
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.7

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Report Date 5/13/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-15
Field Sample ID: Project #30-2025-15.001 / DPG593 SS07

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.9
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.2
Chromium	6010	0.5	11.
Lead	6010	3.0	5.6
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.4

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Report Date 5/13/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-16
Field Sample ID: Project #30-2025-15.001 / DPG593 SS08

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.7
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	11.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.8

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Report Date 5/13/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-17
Field Sample ID: Project #30-2025-15.001 / DPG593 SS09

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.7
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.3
Chromium	6010	0.5	11.
Lead	6010	3.0	25.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.8

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Report Date 5/13/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-18
Field Sample ID: Project #30-2025-15.001 / DPG593 SS10

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.6
Barium	6010	0.5	190.
Cadmium	6010	0.2	4.3
Chromium	6010	0.5	14.
Lead	6010	3.0	740.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.4

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-19
Field Sample ID: Project #30-2025-15.001 / DPG593 SS11

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.5
Barium	6010	0.5	140.
Cadmium	6010	0.2	3.2
Chromium	6010	0.5	10.
Lead	6010	3.0	250.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.6

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Report Date 5/13/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-20
Field Sample ID: Project #30-2025-15.001 / DPG593 SS12

Contact: Renee Zollinger
Received By: Jennifer Habel

463 West 3600 South
Salt Lake City, Utah
84115

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Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.9
Barium	6010	0.5	160.
Cadmium	6010	0.2	3.9
Chromium	6010	0.5	13.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.2

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Report Date 5/13/93

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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-21
Field Sample ID: Project #30-2025-15.001 / DPG593 SS13

Contact: Renee Zollinger
Received By: Jennifer Habel

463 West 3600 South
Salt Lake City, Utah
84115

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Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.1
Barium	6010	0.5	170.
Cadmium	6010	0.2	4.4
Chromium	6010	0.5	13.
Lead	6010	3.0	68.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.5

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Report Date 5/13/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-22
Field Sample ID: Project #30-2025-15.001 / DPG593 SS14

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.8
Barium	6010	0.5	170.
Cadmium	6010	0.2	4.1
Chromium	6010	0.5	13.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.6

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-23
Field Sample ID: Project #30-2025-15.001 / DPG593 SS15

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3.8**
Barium	6010	0.5	**140.**
Cadmium	6010	0.2	**3.6**
Chromium	6010	0.5	**11.**
Lead	6010	3.0	**12.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**2.0**

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Report Date 5/13/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-24
Field Sample ID: Project #30-2025-15.001 / DPG593 SS16

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.6
Barium	6010	0.5	160.
Cadmium	6010	0.2	4.3
Chromium	6010	0.5	13.
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.3

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-25
Field Sample ID: Project #30-2025-15.001 / DPG593 SS17

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.3
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.5
Chromium	6010	0.5	11.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.4

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Report Date 5/13/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-26
Field Sample ID: Project #30-2025-15.001 / DPG593 SS18

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.8
Barium	6010	0.5	140.
Cadmium	6010	0.2	2.9
Chromium	6010	0.5	9.3
Lead	6010	3.0	9.9
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.0

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Report Date 5/13/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-27
Field Sample ID: Project #30-2025-15.001 / DPG593 SS19

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.1
Barium	6010	0.5	140.
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	11.
Lead	6010	3.0	11.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.1

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-28
Field Sample ID: Project #30-2025-15.001 / DPG593 SS20

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.0
Barium	6010	0.5	130.
Cadmium	6010	0.2	2.8
Chromium	6010	0.5	9.5
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.2

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INORGANIC ANALYSIS REPORT

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LABORATORIES

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-29
Field Sample ID: Project #30-2025-15.001 / DPG593 SS21

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2.8**
Barium	6010	0.5	**150.**
Cadmium	6010	0.2	**3.2**
Chromium	6010	0.5	**10.**
Lead	6010	3.0	**9.9**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.8**

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-30
Field Sample ID: Project #30-2025-15.001 / DPG593 SS22

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.1
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.2
Chromium	6010	0.5	11.
Lead	6010	3.0	11.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.2

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-31
Field Sample ID: Project #30-2025-15.001 / DPG593 SS23

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.5
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.7
Chromium	6010	0.5	12.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.7

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-32
Field Sample ID: Project #30-2025-15.001 / DPG593 SS24

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**2.8**
Barium	6010	0.5	**140.**
Cadmium	6010	0.2	**3.3**
Chromium	6010	0.5	**10.**
Lead	6010	3.0	**13.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**2.1**

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-33
Field Sample ID: Project #30-2025-15.001 / DPG593 SS25

Contact: Renee Zollinger
Received By: Jennifer Habel

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.1
Barium	6010	0.5	190.
Cadmium	6010	0.2	4.7
Chromium	6010	0.5	14.
Lead	6010	3.0	19.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.5

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Report Date 5/13/93

INORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Lab Sample ID Number: 13991-34
Field Sample ID: Project #30-2025-15.001 / DPG593 SS26

Contact: Renee Zollinger
Received By: Jennifer Habel

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.0
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	11.
Lead	6010	3.0	15.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.3

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Report Date 5/13/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Set Identification Number: 13991
Set Description: Three Water & Thirty One Solid Samples

Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:
Listed Organic Constituents
in Non-Waste Water

Method Ref. Number:
EPA SW-846 #8270 (mod.)
(Extraction/Direct Injection - GC/

mod

Lab Sample ID. Number:
13991-Method Blank

Field Sample ID. Number:
Method Blank

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Fax (801) 263-8687

Analytical Results RCRA LISTED NON-PURGABLE NTS

Units = mg/kg (ppm) †

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	5.0	<5.0
Isobutyl alcohol	F005	3.0	<3.0
m-Cresol	F004/ D024	1.0	<1.0
o-Cresol	F004/ D023	1.0	<1.0
p-Cresol	F004/ D025	1.0	<1.0
Cyclohexanone	F003	0.5	<0.5
2-Ethoxyethanol	F005	25.	<25.
Methanol	F003	3.0	<3.0
Nitrobenzene	D036	3.0	<3.0
Pyridine	F005/ D038	0.5	<0.5
2,4-Dinitrotoluene	D030	0.5	<0.5
Hexachlorobenzene	D032	0.5	<0.5
Hexachloro-1,3-butadiene	D033	0.5	<0.5
Hexachloroethane	D034	0.5	<0.5
Pentachlorophenol	D037	50.	<50.
2,4,5-Trichlorophenol	D041	0.5	<0.5
2,4,6-Trichlorophenol	D042	0.5	<0.5

< Value = None detected above the specified method detection limit, or a value that re ... e
to interferences.

Short List

T = Trace. Detectable amount is lower than the practical quantitation limit for this (

† = All solid compounds are reported in Dry Weight Basis.

No extraction method

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Report Date

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Set Identification Number: 13991
Set Description: Three Water & Thirty One Solid Samples

Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (mod.) (Extraction/Direct Injection - GC/MS)	May 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-10	Project #30-2025-125.01 / DPG593 SS02

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Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/kg (ppm) †

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Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	5.0	<5.0
Isobutyl alcohol	F005	3.0	<3.0
m-Cresol	F004/ D024	1.0	<1.0
o-Cresol	F004/ D023	1.0	<1.0
p-Cresol	F004/ D025	1.0	<1.0
Cyclohexanone	F003	0.5	<0.5
2-Ethoxyethanol	F005	25.	<25.
Methanol	F003	3.0	<3.0
Nitrobenzene	D036	3.0	<3.0
Pyridine	F005/ D038	0.5	<0.5
2,4-Dinitrotoluene	D030	0.5	<0.5
Hexachlorobenzene	D032	0.5	<0.5
Hexachloro-1,3-butadiene	D033	0.5	<0.5
Hexachloroethane	D034	0.5	<0.5
Pentachlorophenol	D037	50.	<50.
2,4,5-Trichlorophenol	D041	0.5	<0.5
2,4,6-Trichlorophenol	D042	0.5	<0.5

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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Report Date 5/13/93

ORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Set Identification Number: 13991
Set Description: Three Water & Thirty One Solid Samples

Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (mod.) (Extraction/Direct Injection - GC/MS)	May 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-25	Project #30-2025-125.01 / DPG593 SS17

Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	5.0	<5.0
Isobutyl alcohol	F005	3.0	<3.0
m-Cresol	F004/ D024	1.0	<1.0
o-Cresol	F004/ D023	1.0	<1.0
p-Cresol	F004/ D025	1.0	<1.0
Cyclohexanone	F003	0.5	<0.5
2-Ethoxyethanol	F005	25.	<25.
Methanol	F003	3.0	<3.0
Nitrobenzene	D036	3.0	<3.0
Pyridine	F005/ D038	0.5	<0.5
2,4-Dinitrotoluene	D030	0.5	<0.5
Hexachlorobenzene	D032	0.5	<0.5
Hexachloro-1,3-butadiene	D033	0.5	<0.5
Hexachloroethane	D034	0.5	<0.5
Pentachlorophenol	D037	50.	<50.
2,4,5-Trichlorophenol	D041	0.5	<0.5
2,4,6-Trichlorophenol	D042	0.5	<0.5

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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ORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 5, 1993
Set Identification Number: 13991
Set Description: Three Water & Thirty One Solid Samples

Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8240 (Purge & Trap GC/MS)	May 6, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-Method Blank	Method Blank

Analytical Results RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Listing(s):	Detection Limit:	Amount Detected:
Acetone	F003	0.040	<0.040
Benzene	F005/ D018	0.040	<0.040
Carbon disulfide	F005	0.040	<0.040
Carbon tetrachloride	F001/ D019	0.040	<0.040
Chlorobenzene	F002/ D021	0.040	<0.040
Cyclohexanone	F003	0.040	<0.040
1,2-Dichlorobenzene	F002	0.10	<0.10
Ethyl acetate	F003	0.040	<0.040
Ethyl benzene	F003	0.040	<0.040
Ethyl ether	F003	0.040	<0.040
Methylene chloride	F001/ F002	0.040	<0.040
Methyl ethyl ketone	F005/ D035	0.040	<0.040
Methyl isobutyl ketone	F003	0.040	<0.040
2 Nitropropane	F005	0.040	<0.040
Tetrachloroethylene	F001/ F002/ D039	0.040	<0.040
Toluene	F005	0.040	<0.040
1,1,1-Trichloroethane	F001/ F002	0.040	<0.040
1,1,2-Trichloroethane	F002	0.040	<0.040
1,1,2-Trichlorotrifluoroethane	F001/ F002	0.040	<0.040
Trichloroethene	F001/ F002/ D040	0.040	<0.040
Trichlorofluoromethane	F001/ F002	0.040	<0.040
Xylenes (total)	F003	0.040	<0.040

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Lab Sample ID. Number:
13991-Method Blank

Field Sample ID. Number:
Method Blank

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Listing(s)	Detection Limit:	Amount Detected:
Chloroform	D022	0.040	<0.040
1,4-Dichlorobenzene	D027	0.040	<0.040
1,2-Dichloroethane	D028	0.040	<0.040
1,1-Dichloroethene	D029	0.040	<0.040
Vinyl Chloride	D043	0.040	<0.040

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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Report Date 5/13/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Set Identification Number: 13991
Set Description: Three Water & Thirty One Solid Samples

Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8240 (Purge & Trap GC/MS)	May 6, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-10	Project #30-2025-15.001 / DPG593 SS02

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Listing(s):	Detection Limit:	Amount Detected:
Acetone	F003	0.040	<0.040
Benzene	F005/ D018	0.040	<0.040
Carbon disulfide	F005	0.040	<0.040
Carbon tetrachloride	F001/ D019	0.040	<0.040
Chlorobenzene	F002/ D021	0.040	<0.040
Cyclohexanone	F003	0.040	<0.040
1,2-Dichlorobenzene	F002	0.10	<0.10
Ethyl acetate	F003	0.040	<0.040
Ethyl benzene	F003	0.040	<0.040
Ethyl ether	F003	0.040	<0.040
Methylene chloride	F001/ F002	0.040	<0.040
Methyl ethyl ketone	F005/ D035	0.040	<0.040
Methyl isobutyl ketone	F003	0.040	<0.040
2 Nitropropane	F005	0.040	<0.040
Tetrachloroethylene	F001/ F002/ D039	0.040	<0.040
Toluene	F005	0.040	<0.040
1,1,1-Trichloroethane	F001/ F002	0.040	<0.040
1,1,2-Trichloroethane	F002	0.040	<0.040
1,1,2-Trichlorotrifluoroethane	F001/ F002	0.040	<0.040
Trichloroethene	F001/ F002/ D040	0.040	<0.040
Trichlorofluoromethane	F001/ F002	0.040	<0.040
Xylenes (total)	F003	0.040	<0.040

Lab Sample ID. Number:
13991-10

Field Sample ID. Number:
Project #30-2025-15.001 / DPG593 SS02

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Analytical Results RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Listing(s)	Detection Limit:	Amount Detected:
Chloroform	D022	0.040	<0.040
1,4-Dichlorobenzene	D027	0.040	<0.040
1,2-Dichloroethane	D028	0.040	<0.040
1,1-Dichloroethene	D029	0.040	<0.040
Vinyl Chloride	D043	0.040	<0.040

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< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 5, 1993
Set Identification Number: 13991
Set Description: Three Water & Thirty One Solid Samples

Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8240 (Purge & Trap GC/MS)	May 6, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-25	Project #30-2025-15.001 / DPG593 SS17

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Listing(s):	Detection Limit:	Amount Detected:
Acetone	F003	0.040	<0.040
Benzene	F005/ D018	0.040	<0.040
Carbon disulfide	F005	0.040	<0.040
Carbon tetrachloride	F001/ D019	0.040	<0.040
Chlorobenzene	F002/ D021	0.040	<0.040
Cyclohexanone	F003	0.040	<0.040
1,2-Dichlorobenzene	F002	0.10	<0.10
Ethyl acetate	F003	0.040	<0.040
Ethyl benzene	F003	0.040	<0.040
Ethyl ether	F003	0.040	<0.040
Methylene chloride	F001/ F002	0.040	<0.040
Methyl ethyl ketone	F005/ D035	0.040	<0.040
Methyl isobutyl ketone	F003	0.040	<0.040
2 Nitropropane	F005	0.040	<0.040
Tetrachloroethylene	F001/ F002/ D039	0.040	<0.040
Toluene	F005	0.040	<0.040
1,1,1-Trichloroethane	F001/ F002	0.040	<0.040
1,1,2-Trichloroethane	F002	0.040	<0.040
1,1,2-Trichlorotrifluoroethane	F001/ F002	0.040	<0.040
Trichloroethene	F001/ F002/ D040	0.040	<0.040
Trichlorofluoromethane	F001/ F002	0.040	<0.040
Xylenes (total)	F003	0.040	<0.040

AMERICAN WEST ANALYTICAL LABORATORIES

Lab Sample ID. Number:
13991-25

Field Sample ID. Number:
Project #30-2025-15.001 / DPG593 SS17

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Listing(s)	Detection Limit:	Amount Detected:
Chloroform	D022	0.040	<0.040
1,4-Dichlorobenzene	D027	0.040	<0.040
1,2-Dichloroethane	D028	0.040	<0.040
1,1-Dichloroethene	D029	0.040	<0.040
Vinyl Chloride	D043	0.040	<0.040

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< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: ______________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-Method Blank	Method Blank (Liquid)

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-01	Project #30-2025-15.001 / DPG593 01 W

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Salt Lake City, Utah
84115

(801) 263-8686
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Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-02	Project #30-2025-15.001 / DPG593 02 W

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-03	Project #30-2025-15.001 / DPG593 03 W

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-Method Blank	Method Blank (Solid)

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84115

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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-04	Project #30-2025-15.001 / DPG593 S01

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

AMERICAN WEST ANALYTICAL LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-05	Project #30-2025-15.001 / DPG593 S02

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-06	Project #30-2025-15.001 / DPG593 S06 (-1 and -5)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-07	Project #30-2025-15.001 / DPG593 S07 (-1 and -5)

463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:
13991-08

Field Sample ID. Number:
Project #30-2025-15.001 / DPG593 S08 (-1 and -5)

463 West 3600 South
Salt Lake City, Utah
84115

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Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by:
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-10	Project #30-2025-15.001 / DPG593 SS02

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25 T
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-11	Project #30-2025-15.001 / DPG593 SS03

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Salt Lake City, Utah
84115

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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	**0.31**
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-12	Project #30-2025-15.001 / DPG593 SS04

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

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< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number: 13991-13

Field Sample ID. Number: Project #30-2025-15.001 / DPG593 SS05

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

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< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN WEST ANALYTICAL LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-14	Project #30-2025-15.001 / DPG593 SS06

463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/13/93

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463 West 3600 South
Salt Lake City, Utah
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-15	Project #30-2025-15.001 / DPG593 SS07

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25 T
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-16	Project #30-2025-15.001 / DPG593 SS08

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-18	Project #30-2025-15.001 / DPG593 SS10

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	2.2
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-22	Project #30-2025-15.001 / DPG593 SS14

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-24	Project #30-2025-15.001 / DPG593 SS16

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-25	Project #30-2025-15.001 / DPG593 SS17

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-26	Project #30-2025-15.001 / DPG593 SS18

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 10, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 10, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-09	Project #30-2025-15.001 / DPG593 SS01

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25 T
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number: 13991-17

Field Sample ID. Number: Project #30-2025-15.001 / DPG593 SS09

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	1.4
HMX	2.2	<2.2
RDX	1.0	<1.0 T
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES
463 West 3600 South
Salt Lake City, Utah
84115
(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-19	Project #30-2025-15.001 / DPG593 SS11

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	7.0
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	1.3

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by:
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number: 13991-20

Field Sample ID. Number: Project #30-2025-15.001 / DPG593 SS12

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	1.7
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by:
Laboratory Supervisor

Report Date 5/14/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-21	Project #30-2025-15.001 / DPG593 SS13

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25 T
HMX	2.2	<2.2
RDX	1.0	<1.0 T
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number: 13991-23

Field Sample ID. Number: Project #30-2025-15.001 / DPG593 SS15

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25 T
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-27	Project #30-2025-15.001 / DPG593 SS19

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 3, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-28	Project #30-2025-15.001 / DPG593 SS20

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

AMERICAN WEST ANALYTICAL LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-29	Project #30-2025-15.001 / DPG593 SS21

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-30	Project #30-2025-15.001 / DPG593 SS22

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-31	Project #30-2025-15.001 / DPG593 SS23

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/13/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-32	Project #30-2025-15.001 / DPG593 SS24

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-33	Project #30-2025-15.001 / DPG593 SS25

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	**2.0**
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 4, 1993
Date Received: May 5, 1993
Set Description: Three Water & Thirty One Solid Samples

Set Identification #: 13991
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
13991-34	Project #30-2025-15.001 / DPG593 SS26

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/13/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Sample Number: 13991

Contact: Renee Zollinger
Received By: Jennifer Habel
Set Description: Three Water & Thirty One Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
13991-04	RDX	0.0	20.	21.8	21.9	109.	110.	-0.5
13991-22	RDX	0.0	20.	21.7	21.7	109.	109.	0.0
13991-10	Benzene	0.000	0.020	0.021	0.019	105.	95.	10.
13991-10	Chlorobenzene	0.000	0.020	0.020	0.021	100.	105.	-4.9
13991-10	1,2-Dichloroethane	0.000	0.020	0.022	0.020	110.	100.	9.5
13991-10	Toluene	0.000	0.020	0.020	0.018	100.	90.	11.
13991-10	Trichloroethene	0.000	0.020	0.021	0.020	105.	100.	4.9
13991-25	Cyclohexanone	0.0	133.3	162.	162.	122.	122.	0.0
13911-25	2,4-Dinitrotoluene	0.0	133.3	151.	147.	113.	110.	2.7
13911-25	Pentachlorophenol	0.0	133.3	66.4	65.5	49.8	49.1	1.4
13911-25	Pyridine	0.0	133.3	124.	114.	93.3	85.8	8.4

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: [signature] Laboratory Supervisor

Report Date 5/13/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 5, 1993
Sample Number: 13991

Contact: Renee Zollinger
Received By: Jennifer Habel
Set Description: Three Water & Thirty One Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
13991-10	Arsenic	4.0	3.4	7.4	7.5	100.0	102.9	-1.3
13991-21	Arsenic	4.1	3.4	6.9	6.7	82.4	76.5	2.9
13991-01	Barium	0.004	1.1	0.98	0.96	88.7	86.9	2.1
13991-21	Barium	172.	55.	220.	214.	87.3	76.4	2.8
13991-01	Cadmium	0.0	1.1	1.04	1.03	94.5	93.6	1.0
13991-21	Cadmium	4.4	55.	52.	51.	86.5	87.4	1.9
13991-01	Chromium	0.0	1.1	1.04	1.03	94.5	93.6	1.0
13991-21	Chromium	13.	55.	62.	61.	89.1	87.3	1.6
13991-01	Lead	0.0	1.1	1.02	1.03	92.7	93.6	-1.0
13991-21	Lead	68.	55.	118.	117.	90.9	89.1	0.9
13991-09	Mercury	0.0	0.500	0.469	0.465	93.8	93.0	0.9
13991-25	Mercury	0.0	0.002	0.0017	0.0016	85.0	80.0	6.1
13991-10	Selenium	0.0	0.067	0.060	0.062	89.6	92.5	-3.3
13991-31	Selenium	0.0	3.4	2.75	2.75	80.9	80.9	0.0
13991-01	Silver	0.0	55.	1.02	1.00	92.7	90.9	2.0
13991-21	Silver	2.5	55.	53.	53.	91.8	91.8	0.0

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

QC I II III

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 06 1993, 12:39 pm

Login Number: L14002
Account: KLE100 Kleinfelder
Site : PROJECT #30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
L14002-1		DPG593-04	-	05-MAY-93	06-MAY-93	PA 15-MAY-93	
Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:01-NOV-93			
Water	C	AS	Arsenic	Expires:01-NOV-93			
Water	C	BA	Barium	Expires:01-NOV-93			
Water	C	CD	Cadmium	Expires:01-NOV-93			
Water	C	CR	Chromium	Expires:01-NOV-93			
Water	C	HG	Mercury	Expires:01-NOV-93 → 28 days			
Water	C	PB	Lead	Expires:01-NOV-93			
Water	C	SE	Selenium	Expires:01-NOV-93			
Water	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 6		1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Water	S	QC I	Level I QC Package				
L14002-2		DPG593-05		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:01-NOV-93			
Water	C	AS	Arsenic	Expires:01-NOV-93			
Water	C	BA	Barium	Expires:01-NOV-93			
Water	C	CD	Cadmium	Expires:01-NOV-93			
Water	C	CR	Chromium	Expires:01-NOV-93			
Water	C	HG	Mercury	Expires:01-NOV-93			
Water	C	PB	Lead	Expires:01-NOV-93			
Water	C	SE	Selenium	Expires:01-NOV-93			
er	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 6		1 Contain
er	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
ter	S	QC I	Level I QC Package				
L14002-3		DPG593-06		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:01-NOV-93			
Water	C	AS	Arsenic	Expires:01-NOV-93			
Water	C	BA	Barium	Expires:01-NOV-93			
Water	C	CD	Cadmium	Expires:01-NOV-93			
Water	C	CR	Chromium	Expires:01-NOV-93			
Water	C	HG	Mercury	Expires:01-NOV-93			
Water	C	PB	Lead	Expires:01-NOV-93			
Water	C	SE	Selenium	Expires:01-NOV-93			
Water	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 6		1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Water	S	QC I	Level I QC Package				
L14002-4		DPG593-S09(1 & 5)		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Composite these four jars before analyzing; Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:01-NOV-93			
Solids	C	AS	Arsenic	Expires:01-NOV-93			
Solids	C	BA	Barium	Expires:01-NOV-93			
Solids	C	CD	Cadmium	Expires:01-NOV-93			
Solids	C	CR	Chromium	Expires:01-NOV-93			
Solids	C	HG	Mercury	Expires:01-NOV-93			
Solids	C	PB	Lead	Expires:01-NOV-93			
Solids	C	SE	Selenium	Expires:01-NOV-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 6		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Solids	S	QC I	Level I QC Package				
Solids	S	SEMI-F&D	F&D list semivolatiles	Expires:12-MAY-93	hall		1 Contain

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 06 1993, 12:39 pm

Login Number: L14002
Account: KLE100 Kleinfelder
Site : PROJECT #30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
Solids	S	VOC-F&D	F&D list volatiles	Expires:19-MAY-93	jerry			1 Contain
L14002-5		DPG593-S10(1 & 5)		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample, semi's & voc's. Composite these two jars before analyzing; Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 7			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-6		DPG593-S11		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
olids	C	SE	Selenium	Expires:01-NOV-93				
olids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-7		DPG593-S12		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-8		DPG593-S13		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 06 1993, 12:39 pm

Login Number: L14002
Account: KLE100 Kleinfelder
Site : PROJECT #30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Solids	S	QC I	Level I QC Package				
L14002-9		DPG593-S14		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:01-NOV-93			
Solids	C	AS	Arsenic	Expires:01-NOV-93			
Solids	C	BA	Barium	Expires:01-NOV-93			
Solids	C	CD	Cadmium	Expires:01-NOV-93			
Solids	C	CR	Chromium	Expires:01-NOV-93			
Solids	C	HG	Mercury	Expires:01-NOV-93			
Solids	C	PB	Lead	Expires:01-NOV-93			
Solids	C	SE	Selenium	Expires:01-NOV-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 6		1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Solids	S	QC I	Level I QC Package				
Solids	S	SEMI-F&D	F&D list semivolatiles	Expires:12-MAY-93	hall		1 Contain
Solids	S	VOC-F&D	F&D list volatiles	Expires:19-MAY-93	jerry		1 Contain
L14002-10		DPG593-S15		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:01-NOV-93			
Solids	C	AS	Arsenic	Expires:01-NOV-93			
ids	C	BA	Barium	Expires:01-NOV-93			
ids	C	CD	Cadmium	Expires:01-NOV-93			
olids	C	CR	Chromium	Expires:01-NOV-93			
ids	C	HG	Mercury	Expires:01-NOV-93			
lids	C	PB	Lead	Expires:01-NOV-93			
Solids	C	SE	Selenium	Expires:01-NOV-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Solids	S	QC I	Level I QC Package				
L14002-11		DPG593-S16		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:01-NOV-93			
Solids	C	AS	Arsenic	Expires:01-NOV-93			
Solids	C	BA	Barium	Expires:01-NOV-93			
Solids	C	CD	Cadmium	Expires:01-NOV-93			
Solids	C	CR	Chromium	Expires:01-NOV-93			
Solids	C	HG	Mercury	Expires:01-NOV-93			
Solids	C	PB	Lead	Expires:01-NOV-93			
Solids	C	SE	Selenium	Expires:01-NOV-93			
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6		1 Contain
Solids	S	QC I	Level I QC Package				
L14002-12		DPG593-S17		05-MAY-93	06-MAY-93	PA 15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger							
Solids	P	D LIST METALS	8 RCRA				
Solids	C	AG	Silver	Expires:01-NOV-93			
Solids	C	AS	Arsenic	Expires:01-NOV-93			
Solids	C	BA	Barium	Expires:01-NOV-93			
Solids	C	CD	Cadmium	Expires:01-NOV-93			
Solids	C	CR	Chromium	Expires:01-NOV-93			
Solids	C	HG	Mercury	Expires:01-NOV-93			
Solids	C	PB	Lead	Expires:01-NOV-93			

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 06 1993, 12:39 pm

Login Number: L14002
Account: KLE100 Kleinfelder
Site : PROJECT #30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due	PR Date	
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-13		DPG593-S18		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-14		DPG593-S19		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-15		DPG593-S20		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-16		DPG593-S21		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 06 1993, 12:39 pm

Login Number: L14002
Account: KLE100 Kleinfelder
Site : PROJECT #30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-17		DPG593-SS27		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-18		DPG593-SS28		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
ids	C	BA	Barium	Expires:01-NOV-93				
ids	C	CD	Cadmium	Expires:01-NOV-93				
olids	C	CR	Chromium	Expires:01-NOV-93				
lids	C	HG	Mercury	Expires:01-NOV-93				
lids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-19		DPG593-SS29		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-20		DPG593-SS30		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample, voc's & Semi's. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 06 1993, 12:39 pm

Login Number: L14002
Account: KLE100 Kleinfelder
Site : PROJECT #30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93	may 6			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
Solids	S	SEMI-F&D	F&D list semivolatiles	Expires:12-MAY-93	hall			1 Contain
Solids	S	VOC-F&D	F&D list volatiles	Expires:19-MAY-93	jerry			1 Contain
L14002-21		DPG593-SS31		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					
L14002-22		DPG593-SS32		05-MAY-93	06-MAY-93	PA	15-MAY-93	
Share sample. Level 1 QC. Explosives are HMX, RDX, TNT & DNT. Contact: Renee Zollinger								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:01-NOV-93				
Solids	C	AS	Arsenic	Expires:01-NOV-93				
Solids	C	BA	Barium	Expires:01-NOV-93				
Solids	C	CD	Cadmium	Expires:01-NOV-93				
Solids	C	CR	Chromium	Expires:01-NOV-93				
Solids	C	HG	Mercury	Expires:01-NOV-93				
Solids	C	PB	Lead	Expires:01-NOV-93				
Solids	C	SE	Selenium	Expires:01-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:01-NOV-93				1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:19-MAY-93	may 6			1 Contain
Solids	S	QC I	Level I QC Package					

Signature: ______________________

Date: ______________________

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	**0.007**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 7/28/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-01
Field Sample ID: Project #30-2025-15.001/DPG593-04

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-02
Field Sample ID: Project #30-2025-15.001/DPG593-05

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.004**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-03
Field Sample ID: Project #30-2025-15.001/DPG593-06

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.006**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

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Laboratory Supervisor

Report Date 7/28/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-04
Field Sample ID: Project #30-2025-15.001/DPG593-S09 (-1 and -5)

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**5.3**
Barium	6010	0.5	**190.**
Cadmium	6010	0.2	**2.4**
Chromium	6010	0.5	**11.**
Lead	6010	3.0	**12.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by:
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-05
Field Sample ID: Project #30-2025-15.001/DPG593-S10 (-1 and -5)

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**5.4**
Barium	6010	0.5	**190.**
Cadmium	6010	0.2	**3.1**
Chromium	6010	0.5	**14.**
Lead	6010	3.0	**14.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.7**

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Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-06
Field Sample ID: Project #30-2025-15.001/DPG593-S11

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.0
Barium	6010	0.5	140.
Cadmium	6010	0.2	2.8
Chromium	6010	0.5	12.
Lead	6010	3.0	15.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.1

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Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-07
Field Sample ID: Project #30-2025-15.001/DPG593-S12

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.5
Barium	6010	0.5	190.
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	15.
Lead	6010	3.0	16.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	0.8

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Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-08
Field Sample ID: Project #30-2025-15.001/DPG593-S13

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.8
Barium	6010	0.5	240.
Cadmium	6010	0.2	2.9
Chromium	6010	0.5	13.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.0

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Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-09
Field Sample ID: Project #30-2025-15.001/DPG593-S14

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.5
Barium	6010	0.5	210.
Cadmium	6010	0.2	1.8
Chromium	6010	0.5	9.1
Lead	6010	3.0	13.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	0.9

Released by: ____________________
Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-10
Field Sample ID: Project #30-2025-15.001/DPG593-S15

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	8.2
Barium	6010	0.5	380.
Cadmium	6010	0.2	3.4
Chromium	6010	0.5	16.
Lead	6010	3.0	16.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.0

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-11
Field Sample ID: Project #30-2025-15.001/DPG593-S16

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.3
Barium	6010	0.5	200.
Cadmium	6010	0.2	3.3
Chromium	6010	0.5	14.
Lead	6010	3.0	15.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.3

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Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-12
Field Sample ID: Project #30-2025-15.001/DPG593-S17

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.0
Barium	6010	0.5	120.
Cadmium	6010	0.2	1.4
Chromium	6010	0.5	6.8
Lead	6010	3.0	9.6
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-13
Field Sample ID: Project #30-2025-15.001/DPG593-S18

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**4.4**
Barium	6010	0.5	**210.**
Cadmium	6010	0.2	**3.0**
Chromium	6010	0.5	**13.**
Lead	6010	3.0	**12.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.9**

Released by: ____________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-14
Field Sample ID: Project #30-2025-15.001/DPG593-S19

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	11.
Barium	6010	0.5	150.
Cadmium	6010	0.2	3.2
Chromium	6010	0.5	15.
Lead	6010	3.0	8.2
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN WEST ANALYTICAL LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-15
Field Sample ID: Project #30-2025-15.001/DPG593-S20

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	6.2
Barium	6010	0.5	280.
Cadmium	6010	0.2	1.7
Chromium	6010	0.5	10.
Lead	6010	3.0	6.2
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 5/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-16
Field Sample ID: Project #30-2025-15.001/DPG593-S21

Contact: Renee Zollinger
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	8.1
Barium	6010	0.5	200.
Cadmium	6010	0.2	2.9
Chromium	6010	0.5	13.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by: ____________________
Laboratory Supervisor

Report Date 5/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-17
Field Sample ID: Project #30-2025-15.001/DPG593-SS27

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.3
Barium	6010	0.5	170.
Cadmium	6010	0.2	1.9
Chromium	6010	0.5	9.8
Lead	6010	3.0	13.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 5/17/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-18
Field Sample ID: Project #30-2025-15.001/DPG593-SS28

Contact: Renee Zollinger
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.8
Barium	6010	0.5	160.
Cadmium	6010	0.2	1.1
Chromium	6010	0.5	7.1
Lead	6010	3.0	10.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

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INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-19
Field Sample ID: Project #30-2025-15.001/DPG593-SS29

Contact: Renee Zollinger
Received By: Judi Smith

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**4.0**
Barium	6010	0.5	**180.**
Cadmium	6010	0.2	**2.4**
Chromium	6010	0.5	**12.**
Lead	6010	3.0	**12.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

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Report Date 5/17/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-20
Field Sample ID: Project #30-2025-15.001/DPG593-SS30

Contact: Renee Zollinger
Received By: Judi Smith

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3.5**
Barium	6010	0.5	**170.**
Cadmium	6010	0.2	**1.5**
Chromium	6010	0.5	**8.8**
Lead	6010	3.0	**18.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

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INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-21
Field Sample ID: Project #30-2025-15.001/DPG593-SS31

Contact: Renee Zollinger
Received By: Judi Smith

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**3.7**
Barium	6010	0.5	**190.**
Cadmium	6010	0.2	**2.2**
Chromium	6010	0.5	**11.**
Lead	6010	3.0	**14.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Lab Sample ID Number: 14002-22
Field Sample ID: Project #30-2025-15.001/DPG593-SS32

Contact: Renee Zollinger
Received By: Judi Smith

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.0
Barium	6010	0.5	240.
Cadmium	6010	0.2	3.2
Chromium	6010	0.5	15.
Lead	6010	3.0	22.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

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AMERICAN WEST ANALYTICAL LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (mod.) (Extraction/Direct Injection - GC/MS)	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-Method Blank	Method Blank

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Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	1.0	<1.0
Isobutyl alcohol	F005	0.5	<0.5
m-Cresol	F004/ D024	0.2	<0.2
o-Cresol	F004/ D023	0.2	<0.2
p-Cresol	F004/ D025	0.2	<0.2
Cyclohexanone	F003	0.1	<0.1
2-Ethoxyethanol	F005	5.0	<5.0
Methanol	F003	0.5	<0.5
Nitrobenzene	D036	0.5	<0.5
Pyridine	F005/ D038	0.1	<0.1
2,4-Dinitrotoluene	D030	0.1	<0.1
Hexachlorobenzene	D032	0.1	<0.1
Hexachloro-1,3-butadiene	D033	0.1	<0.1
Hexachloroethane	D034	0.1	<0.1
Pentachlorophenol	D037	10.0	<10.0
2,4,5-Trichlorophenol	D041	0.1	<0.1
2,4,6-Trichlorophenol	D042	0.1	<0.1

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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ORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (mod.) (Extraction/Direct Injection - GC/MS)	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-04	Project #30-2025-15.001/DPG593-S09 (-1 and -5)

Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	10.	<10.
Isobutyl alcohol	F005	5.0	<5.0
m-Cresol	F004/ D024	2.0	<2.0
o-Cresol	F004/ D023	2.0	<2.0
p-Cresol	F004/ D025	2.0	<2.0
Cyclohexanone	F003	1.0	<1.0
2-Ethoxyethanol	F005	50.	<50.
Methanol	F003	5.0	<5.0
Nitrobenzene	D036	5.0	<5.0
Pyridine	F005/ D038	1.0	<1.0
2,4-Dinitrotoluene	D030	1.0	<1.0
Hexachlorobenzene	D032	1.0	<1.0
Hexachloro-1,3-butadiene	D033	1.0	<1.0
Hexachloroethane	D034	1.0	<1.0
Pentachlorophenol	D037	100.	<100.
2,4,5-Trichlorophenol	D041	1.0	<1.0
2,4,6-Trichlorophenol	D042	1.0	<1.0

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (mod.) (Extraction/Direct Injection - GC/MS)	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-09	Project #30-2025-150.01/DPG593-S14

Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	10.	<10.
Isobutyl alcohol	F005	5.0	<5.0
m-Cresol	F004/ D024	2.0	<2.0
o-Cresol	F004/ D023	2.0	<2.0
p-Cresol	F004/ D025	2.0	<2.0
Cyclohexanone	F003	1.0	<1.0
2-Ethoxyethanol	F005	50.	<50.
Methanol	F003	5.0	<5.0
Nitrobenzene	D036	5.0	<5.0
Pyridine	F005/ D038	1.0	<1.0
2,4-Dinitrotoluene	D030	1.0	<1.0
Hexachlorobenzene	D032	1.0	<1.0
Hexachloro-1,3-butadiene	D033	1.0	<1.0
Hexachloroethane	D034	1.0	<1.0
Pentachlorophenol	D037	100.	<100.
2,4,5-Trichlorophenol	D041	1.0	<1.0
2,4,6-Trichlorophenol	D042	1.0	<1.0

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (mod.) (Extraction/Direct Injection - GC/MS)	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-20	Project #30-2025-15.001/DPG593-SS30

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Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/kg (ppm) †

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	5.0	<5.0
Isobutyl alcohol	F005	2.5	<2.5
m-Cresol	F004/ D024	1.0	<1.0
o-Cresol	F004/ D023	1.0	<1.0
p-Cresol	F004/ D025	1.0	<1.0
Cyclohexanone	F003	0.5	<0.5
2-Ethoxyethanol	F005	25.	<25.
Methanol	F003	2.5	<2.5
Nitrobenzene	D036	2.5	<2.5
Pyridine	F005/ D038	0.5	<0.5
2,4-Dinitrotoluene	D030	0.5	<0.5
Hexachlorobenzene	D032	0.5	<0.5
Hexachloro-1,3-butadiene	D033	0.5	<0.5
Hexachloroethane	D034	0.5	<0.5
Pentachlorophenol	D037	50.	<50.
2,4,5-Trichlorophenol	D041	0.5	<0.5
2,4,6-Trichlorophenol	D042	0.5	<0.5

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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ORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	May 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-Method Blank	Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

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Lab Sample ID. Number: 14002-Method Blank

Field Sample ID. Number: Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

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Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

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Lab Sample ID. Number:	Field Sample ID. Number:
14002-Method Blank	Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

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Report Date 5/17/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	May 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-04	Project #30-2025-15.001/DPG593-S09 (-1 and -5)

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Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

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Lab Sample ID. Number:
14002-04

Field Sample ID. Number:
Project #30-2025-15.001/DPG593-S09 (-1 and -5)

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

Report Date 5/17/93

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Lab Sample ID. Number: 14002-04

Field Sample ID. Number: Project #30-2025-15.001/DPG593-S09 (-1 and -5)

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

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Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: ____________________
Laboratory Supervisor

Report Date 5/17/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	May 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-09	Project #30-2025-150.01/DPG593-S14

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

Report Date 5/17/93

AMERICAN
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463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:
14002-09

Field Sample ID. Number:
Project #30-2025-150.01/DPG593-S14

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

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Lab Sample ID. Number:
14002-09

Field Sample ID. Number:
Project #30-2025-150.01/DPG593-S14

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: ______________________
Laboratory Supervisor

Report Date 5/17/93

AMERICAN WEST ANALYTICAL LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Set Identification Number: 14002
Set Description: Three Water & Nineteen Solid Samples

Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	May 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-20	Project #30-2025-15.001/DPG593-SS30

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

AMERICAN
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LABORATORIES

Lab Sample ID. Number:
14002-20

Field Sample ID. Number:
Project #30-2025-15.001/DPG593-SS30

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

463 West 3600 South
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463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:
14002-20

Field Sample ID. Number:
Project #30-2025-15.001/DPG593-SS30

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = mg/kg (ppm) †

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: [signature]
Laboratory Supervisor

Report Date 5/17/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 10, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-Method Blank	Method Blank (Liquid)

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 10, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-01	Project #30-2025-15.001/DPG593-04

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 10, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-02	Project #30-2025-15.001/DPG593-05

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 10, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-03	Project #30-2025-15.001/DPG593-06

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.010	<0.010
HMX	0.013	<0.013
RDX	0.014	<0.014
TNT	0.010	<0.010

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ________________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-04	Project #30-2025-15.001/DPG593-S09 (-1 and -5)

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-05	Project #30-2025-15.001/DPG593-S10 (-1 and -5)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-06	Project #30-2025-15.001/DPG593-S11

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-07	Project #30-2025-15.001/DPG593-S12

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-08	Project #30-2025-15.001/DPG593-S13

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
Fax (801) 263-8687

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-09	Project #30-2025-15.001/DPG593-S14

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-10	Project #30-2025-15.001/DPG593-S15

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ________________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-11	Project #30-2025-15.001/DPG593-S16

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-12	Project #30-2025-15.001/DPG593-S17

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-13	Project #30-2025-15.001/DPG593-S18

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-14	Project #30-2025-15.001/DPG593-S19

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-15	Project #30-2025-15.001/DPG593-S20

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-16	Project #30-2025-15.001/DPG593-S21

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________.
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-17	Project #30-2025-15.001/DPG593-SS27

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-19	Project #30-2025-15.001/DPG593-SS29

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-18	Project #30-2025-15.001/DPG593-SS28

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-20	Project #30-2025-15.001/DPG593-SS30

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-21	Project #30-2025-15.001/DPG593-SS31

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________
Laboratory Supervisor

Report Date 5/18/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 5, 1993
Date Received: May 6, 1993
Set Description: Three Water & Nineteen Solid Samples

Set Identification #: 14002
Contact: Renee Zollinger
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14002-22	Project #30-2025-15.001/DPG593-SS32

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/18/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Sample Number: 14002

Contact: Renee Zollinger
Received By: Judi Smith
Set Description: Three Water & Nineteen Solid Samples

Quality Control Results

Units = (ppb)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14013-03	Benzene	0.0	20.0	17.4	16.4	87.0	82.0	5.9
14013-03	Chlorobenzene	0.0	20.0	21.8	20.5	109.0	102.5	6.1
14013-03	1,2-Dichloroethane	0.0	20.0	18.4	17.5	92.0	87.5	5.0
14013-03	Toluene	0.0	20.0	19.9	19.1	99.5	95.5	4.1
14013-03	Trichloroethene	0.0	20.0	21.8	21.2	109.0	106.0	2.8

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 5/18/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Sample Number: 14002

Contact: Renee Zollinger
Received By: Judi Smith
Set Description: Three Water & Nineteen Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14002-03	RDX	0.0	30.	29.8	29.2	99.	97.	2.0
14002-08	RDX	0.0	20.	18.4	18.5	92.	93.	-0.5
14002-04	Cyclohexanone	0.0	100.	121.8	114.8	122.	115.	5.9
14002-04	2,4-Dinitrotoluene	0.0	100.	100.4	97.4	100.	97.4	3.0
14002-04	Pentachlorophenol	0.0	100.	82.9	73.7	82.9	73.7	12.
14002-04	Pyridine	0.0	100.	101.4	97.4	101.	97.4	4.0

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: _______________ Laboratory Supervisor

Report Date 5/18/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 6, 1993
Sample Number: 14002

Contact: Renee Zollinger
Received By: Judi Smith
Set Description: Three Water & Nineteen Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14002-01	Arsenic	0.0	0.067	0.071	0.072	106.0	107.5	-1.4
14002-11	Arsenic	4.3	3.4	6.7	7.0	70.6	79.4	-4.4
14002-01	Barium	0.002	1.1	1.23	1.22	111.6	110.7	0.8
14002-21	Barium	190.	55.	239.	240.	89.1	90.9	-0.4
14002-01	Cadmium	0.0	1.1	1.11	1.11	100.9	100.9	0.0
14002-21	Cadmium	2.2	55.	50.5	50.6	87.8	88.0	-0.2
14002-01	Chromium	0.0	1.1	1.13	1.12	102.7	101.8	0.9
14002-21	Chromium	11.	55.	59.2	59.4	87.6	88.0	-0.3
14002-01	Lead	0.0	1.1	0.98	1.00	89.1	90.9	-2.0
14002-21	Lead	14.	55.	64.	66.	90.9	94.5	-3.1
14002-09	Mercury	0.0	0.500	0.370	0.400	74.0	80.2	-8.0
14002-17	Mercury	0.0	0.500	0.400	0.390	80.0	78.0	2.5
14002-01	Selenium	0.0	0.067	0.057	0.054	85.1	80.6	5.4
14002-11	Selenium	0.0	0.067	0.062	0.057	92.5	85.1	8.4
14002-01	Silver	0.0	1.1	1.18	1.19	107.3	108.2	-0.8
14002-21	Silver	0.0	55.	54.1	54.0	98.4	98.2	0.2

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ____________________
Laboratory Supervisor

Report Date 5/18/93

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 19 1993, 03:09 pm

Login Number: L14141
Account: KLE100 Kleinfelder
Site : DUGWAY OB/OD

QC 1

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date		Due Date
L14141-1	DPG593S27		18-MAY-93	19-MAY-93	PA	28-MAY-93

Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals; Contact: Renee Zollinger

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:14-NOV-93		
Solids	C	AS	Arsenic	Expires:14-NOV-93		
Solids	C	BA	Barium	Expires:14-NOV-93		
Solids	C	CD	Cadmium	Expires:14-NOV-93		
Solids	C	CR	Chromium	Expires:14-NOV-93		
Solids	C	HG	Mercury	Expires:14-NOV-93		
Solids	C	PB	Lead	Expires:14-NOV-93		
Solids	C	SE	Selenium	Expires:14-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:14-NOV-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19	1 Contain
Solids	S	QC I	Level I QC Package			

L14141-2 DPG593S28 18-MAY-93 19-MAY-93 PA 28-MAY-93

Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:14-NOV-93		
Solids	C	AS	Arsenic	Expires:14-NOV-93		
Solids	C	BA	Barium	Expires:14-NOV-93		
Solids	C	CD	Cadmium	Expires:14-NOV-93		
Solids	C	CR	Chromium	Expires:14-NOV-93		
Solids	C	HG	Mercury	Expires:14-NOV-93		
Solids	C	PB	Lead	Expires:14-NOV-93		
lids	C	SE	Selenium	Expires:14-NOV-93		
lids	S	DIG-MET	Total Metal Digestion	Expires:14-NOV-93		
lids	S	EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19	1 Contain
lids	S	QC I	Level I QC Package			

L14141-3 DPG593S29 18-MAY-93 19-MAY-93 PA 28-MAY-93

Level 1 QC; Analyze for HMX, RDX, TNT & DNT only

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:14-NOV-93		
Water	C	AS	Arsenic	Expires:14-NOV-93		
Water	C	BA	Barium	Expires:14-NOV-93		
Water	C	CD	Cadmium	Expires:14-NOV-93		
Water	C	CR	Chromium	Expires:14-NOV-93		
Water	C	HG	Mercury	Expires:14-NOV-93		
Water	C	PB	Lead	Expires:14-NOV-93		
Water	C	SE	Selenium	Expires:14-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:14-NOV-93	may 19	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19	1 Contain
Water	S	QC I	Level I QC Package			

L14141-4 DPG593S30 18-MAY-93 19-MAY-93 PA 28-MAY-93

Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:14-NOV-93		
Solids	C	AS	Arsenic	Expires:14-NOV-93		
Solids	C	BA	Barium	Expires:14-NOV-93		
Solids	C	CD	Cadmium	Expires:14-NOV-93		
Solids	C	CR	Chromium	Expires:14-NOV-93		
Solids	C	HG	Mercury	Expires:14-NOV-93		
Solids	C	PB	Lead	Expires:14-NOV-93		
Solids	C	SE	Selenium	Expires:14-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:14-NOV-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19	1 Contain
Solids	S	QC I	Level I QC Package			

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 19 1993, 03:09 pm

Login Number: L14141
Account: KLE100 Kleinfelder
Site : DUGWAY 08/OD

Laboratory Sample Number	Client Sample Number	Method Description		Collect Date	Receive Date	PR	Due Date	
L14141-5	DPG593S31			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						
L14141-6	DPG593S32			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
lids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Conta
lids	S QC I	Level I QC Package						
L14141-7	DPG593S33			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						
L14141-8	DPG593S34			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 19 1993, 03:09 pm

Login Number: L14141
Account: KLE100 Kleinfelder
Site : DUGWAY OB/OD

Laboratory Sample Number	Client Sample Number	Method Description		Collect Date	Receive Date	PR	Due Date	
L14141-9	DPG593S35			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						
L14141-10	DPG593S36			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						
L14141-11	DPG593S37			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						
L14141-12	DPG593S38			18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals								
Solids	P D LIST METALS	8 RCRA						
Solids	C AG	Silver	Expires:14-NOV-93					
Solids	C AS	Arsenic	Expires:14-NOV-93					
Solids	C BA	Barium	Expires:14-NOV-93					
Solids	C CD	Cadmium	Expires:14-NOV-93					
Solids	C CR	Chromium	Expires:14-NOV-93					
Solids	C HG	Mercury	Expires:14-NOV-93					
Solids	C PB	Lead	Expires:14-NOV-93					
Solids	C SE	Selenium	Expires:14-NOV-93					
Solids	S DIG-MET	Total Metal Digestion	Expires:14-NOV-93					
Solids	S EXP-CYC	Cyclic Explosives	Expires:01-JUN-93	may 19				1 Contain
Solids	S QC I	Level I QC Package						

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 19 1993, 03:09 pm

Login Number: L14141
Account: KLE100 Kleinfelder
Site : DUGWAY OB/OD

Laboratory Sample Number			Client Sample Number	Method Description	Collect Date	Receive Date		Due PR Date	
L14141-13			DPG593S39		18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals									
Solids	P	D LIST METALS		8 RCRA					
Solids	C	AG		Silver	Expires:14-NOV-93				
Solids	C	AS		Arsenic	Expires:14-NOV-93				
Solids	C	BA		Barium	Expires:14-NOV-93				
Solids	C	CD		Cadmium	Expires:14-NOV-93				
Solids	C	CR		Chromium	Expires:14-NOV-93				
Solids	C	HG		Mercury	Expires:14-NOV-93				
Solids	C	PB		Lead	Expires:14-NOV-93				
Solids	C	SE		Selenium	Expires:14-NOV-93				
Solids	S	DIG-MET		Total Metal Digestion	Expires:14-NOV-93				
Solids	S	EXP-CYC		Cyclic Explosives	Expires:01-JUN-93	may 19			1 Contain
Solids	S	QC I		Level I QC Package					
L14141-14			DPG593S40		18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only; Share sample w/metals									
Solids	P	D LIST METALS		8 RCRA					
Solids	C	AG		Silver	Expires:14-NOV-93				
Solids	C	AS		Arsenic	Expires:14-NOV-93				
Solids	C	BA		Barium	Expires:14-NOV-93				
Solids	C	CD		Cadmium	Expires:14-NOV-93				
Solids	C	CR		Chromium	Expires:14-NOV-93				
Solids	C	HG		Mercury	Expires:14-NOV-93				
Solids	C	PB		Lead	Expires:14-NOV-93				
Solids	C	SE		Selenium	Expires:14-NOV-93				
Solids	S	DIG-MET		Total Metal Digestion	Expires:14-NOV-93				
olids	S	EXP-CYC		Cyclic Explosives	Expires:01-JUN-93	may 19			1 Cont
Solids	S	QC I		Level I QC Package					
L14141-15			DPG593S41		18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only									
Water	P	D LIST METALS		8 RCRA					
Water	C	AG		Silver	Expires:14-NOV-93				
Water	C	AS		Arsenic	Expires:14-NOV-93				
Water	C	BA		Barium	Expires:14-NOV-93				
Water	C	CD		Cadmium	Expires:14-NOV-93				
Water	C	CR		Chromium	Expires:14-NOV-93				
Water	C	HG		Mercury	Expires:14-NOV-93				
Water	C	PB		Lead	Expires:14-NOV-93				
Water	C	SE		Selenium	Expires:14-NOV-93				
Water	S	DIG-MET		Total Metal Digestion	Expires:14-NOV-93	may 19			1 Contain
Water	S	EXP-CYC		Cyclic Explosives	Expires:01-JUN-93	may 19			1 Contain
Water	S	QC I		Level I QC Package					
L14141-16			DPG593S42		18-MAY-93	19-MAY-93	PA	28-MAY-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT only									
Water	P	D LIST METALS		8 RCRA					
Water	C	AG		Silver	Expires:14-NOV-93				
Water	C	AS		Arsenic	Expires:14-NOV-93				
Water	C	BA		Barium	Expires:14-NOV-93				
Water	C	CD		Cadmium	Expires:14-NOV-93				
Water	C	CR		Chromium	Expires:14-NOV-93				
Water	C	HG		Mercury	Expires:14-NOV-93				
Water	C	PB		Lead	Expires:14-NOV-93				
Water	C	SE		Selenium	Expires:14-NOV-93				
Water	S	DIG-MET		Total Metal Digestion	Expires:14-NOV-93	may 19			1 Contain
Water	S	EXP-CYC		Cyclic Explosives	Expires:01-JUN-93	may 19			1 Contain
Water	S	QC I		Level I QC Package					

Signature: ______________________

Date: ______________________

AMERICAN WEST ANALYTICAL LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Renee Zollinger
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 7/28/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-03
Field Sample ID: Project # 30-2025-15.001/DPG593 S29

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-15
Field Sample ID: Project # 30-2025-15.001/DPG593 S41

Contact: Renee Zollinger
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-16
Field Sample ID: Project # 30-2025-15.001/DPG593 S42

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Salt Lake City, Utah
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Fax (801) 263-8687

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Laboratory Supervisor

Report Date 5/27/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	<0.5
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 7/28/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-01
Field Sample ID: Project # 30-2025-15.001/DPG593 S27

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.6
Barium	6010	0.5	82.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	12.
Lead	6010	3.0	9.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	3.2

463 West 3600 South
Salt Lake City, Utah
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Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-02
Field Sample ID: Project # 30-2025-15.001/DPG593 S28

Contact: Renee Zollinger
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.1
Barium	6010	0.5	210.
Cadmium	6010	0.2	0.5
Chromium	6010	0.5	14.
Lead	6010	3.0	13.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.3
Silver	6010	0.5	3.7

Released by: ______________________
Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-04
Field Sample ID: Project # 30-2025-15.001/DPG593 S30

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.2
Barium	6010	0.5	150.
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	13.
Lead	6010	3.0	9.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	2.1

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Salt Lake City, Utah
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Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-05
Field Sample ID: Project # 30-2025-15.001/DPG593 S31

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	9.9
Barium	6010	0.5	270.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	24.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.4
Silver	6010	0.5	3.0

Released by: ____________________
Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-06
Field Sample ID: Project # 30-2025-15.001/DPG593 S32

Contact: Renee Zollinger
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.4
Barium	6010	0.5	170.
Cadmium	6010	0.2	0.5
Chromium	6010	0.5	15.
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.0

Released by: ______________________
Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-07
Field Sample ID: Project # 30-2025-15.001/DPG593 S33

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.3
Barium	6010	0.5	330.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	12.
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.5
Silver	6010	0.5	3.1

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Salt Lake City, Utah
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Released by:
Laboratory Supervisor

Report Date 5/27/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-08
Field Sample ID: Project # 30-2025-15.001/DPG593 S34

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

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Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.0
Barium	6010	0.5	190.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	15.
Lead	6010	3.0	10.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	2.8

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Laboratory Supervisor

Report Date 5/27/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-09
Field Sample ID: Project # 30-2025-15.001/DPG593 S35

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.8
Barium	6010	0.5	180.
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	17.
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.8

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Report Date 5/27/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-10
Field Sample ID: Project # 30-2025-15.001/DPG593 S36

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

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TOTAL METALS	**Method Used:**	**Detection Limit:** mg/kg	**Amount Detected:** mg/kg
Arsenic	7060	0.5	5.0
Barium	6010	0.5	140.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	12.
Lead	6010	3.0	8.6
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.1

Released by:
Laboratory Supervisor

Report Date 5/27/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-11
Field Sample ID: Project # 30-2025-15.001/DPG593 S37

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.8
Barium	6010	0.5	130.
Cadmium	6010	0.2	0.7
Chromium	6010	0.5	16.
Lead	6010	3.0	18.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	3.1

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Report Date 5/27/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-12
Field Sample ID: Project # 30-2025-15.001/DPG593 S38

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.3
Barium	6010	0.5	260.
Cadmium	6010	0.2	0.7
Chromium	6010	0.5	15.
Lead	6010	3.0	13.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.4

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Report Date 5/27/93

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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-13
Field Sample ID: Project # 30-2025-15.001/DPG593 S39

Contact: Renee Zollinger
Received By: Elona Hayward

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(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.9
Barium	6010	0.5	190.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	15.
Lead	6010	3.0	11.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.9

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Laboratory Supervisor

Report Date 5/27/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Lab Sample ID Number: 14141-14
Field Sample ID: Project # 30-2025-15.001/DPG593 S40

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.6
Barium	6010	0.5	90.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	6.2
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.2

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Laboratory Supervisor

Report Date 5/27/93

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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-Method Blank	Method Blank (Liquid)

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Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-03	Project #30-2025-15.001 / DPG593 S29

463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/28/93

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-15	Project #30-2025-15.001 / DPG593 S41

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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/28/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 8, 1993

Lab Sample ID. Number: 14141-16

Field Sample ID. Number: Project #30-2025-15.001 / DPG593 S42

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Salt Lake City, Utah
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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/28/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 17, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

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ORGANIC ANALYSIS REPORT

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(801) 263-8686
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Client: Kleinfelder
Date Sampled: May 17, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-01	Project #30-2025-15.001 / DPG593 S27

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 5/28/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 17, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-02	Project #30-2025-15.001 / DPG593 S28

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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-04	Project #30-2025-15.001 / DPG593 S30

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Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number: 14141-05

Field Sample ID. Number: Project #30-2025-15.001 / DPG593 S31

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Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
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Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-06	Project #30-2025-15.001 / DPG593 S32

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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-07	Project #30-2025-15.001 / DPG593 S33

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-08	Project #30-2025-15.001 / DPG593 S34

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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-09	Project #30-2025-15.001 / DPG593 S35

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

ORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-10	Project #30-2025-15.001 / DPG593 S36

463 West 3600 South
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(801) 263-8686
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Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-11	Project #30-2025-15.001 / DPG593 S37

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

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< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

ORGANIC ANALYSIS REPORT

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Client: Kleinfelder
Date Sampled: May 18 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-12	Project #30-2025-15.001 / DPG593 S38

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Analytical Results

Units = mg/kg (ppm)

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Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 5/28/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-14	Project #30-2025-15.001 / DPG593 S40

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 5/28/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 18, 1993
Date Received: May 19, 1993
Set Description: Three Water and Thirteen Solid Samples

Set Identification #: 14141
Contact: Renee Zollinger
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
HMX,RDX,TNT, & DNT	EPA SW-846 #8330	May 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14141-13	Project #30-2025-15.001 / DPG593 S39

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 5/28/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 19, 1993
Sample Number: 14141

Contact: Renee Zollinger
Received By: Elona Hayward
Set Description: Three Water and Thirteen Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14120-01	Arsenic	0.041	0.067	0.095	0.092	80.6	76.1	3.2
14141-03	Barium	0.0	1.1	1.07	1.07	97.3	97.3	0.0
14141-03	Cadmium	0.0	1.1	1.19	1.18	108.2	107.3	0.8
14141-03	Chromium	0.0	1.1	1.17	1.15	106.4	104.5	1.7
14141-03	Lead	0.0	1.1	1.22	1.25	110.9	113.6	-2.4
14151-01	Mercury	0.0	0.01	0.0108	0.011	108.0	110.0	-1.8
14120-01	Selenium	0.0	0.067	0.048	0.050	71.6	74.6	-4.1
14141-03	Silver	0.0	1.1	1.14	1.14	103.6	103.6	0.0
14141-14	RDX	0.00	10.2	10.9	10.3	107.	101.	5.7

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100$$

$$\%SR = \frac{(SSR - SR)}{SA} * 100$$

$$\%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 5/27/93

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 27 1993, 10:34 am

Login Number: L14247
Account: KLE100 Kleinfelder
Site : DUGWAY 08/00

QC

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14247-1		DPG593S43		24-MAY-93	27-MAY-93	PA	08-JUN-93

Level 1 QC; Analyze for HMX, RDX, TNT & DNT; Project# 30-2025-14.001

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:20-NOV-93		
Water	C	AS	Arsenic	Expires:20-NOV-93		
Water	C	BA	Barium	Expires:20-NOV-93		
Water	C	CD	Cadmium	Expires:20-NOV-93		
Water	C	CR	Chromium	Expires:20-NOV-93		
Water	C	HG	Mercury	Expires:20-NOV-93		
Water	C	PB	Lead	Expires:20-NOV-93		
Water	C	SE	Selenium	Expires:20-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:20-NOV-93	may 27	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:07-JUN-93	may 27	1 Contain
Water	S	EXP-NITRO	Nitroglycerin	Expires:07-JUN-93		
Water	S	QC I	Level I QC Package			

L14247-2	DPG593S44	26-MAY-93	27-MAY-93	PA	08-JUN-93	

Level 1 QC; Analyze for HMX, RDX, TNT & DNT; Share sample w/metals

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:22-NOV-93		
Solids	C	AS	Arsenic	Expires:22-NOV-93		
Solids	C	BA	Barium	Expires:22-NOV-93		
Solids	C	CD	Cadmium	Expires:22-NOV-93		
Solids	C	CR	Chromium	Expires:22-NOV-93		
Solids	C	HG	Mercury	Expires:22-NOV-93		
Solids	C	PB	Lead	Expires:22-NOV-93		
ids	C	SE	Selenium	Expires:22-NOV-93		
ids	S	DIG-MET	Total Metal Digestion	Expires:22-NOV-93	may 27	1 Contain
lids	S	EXP-CYC	Cyclic Explosives	Expires:09-JUN-93	may 27	1 Contain
lids	S	EXP-NITRO	Nitroglycerin	Expires:09-JUN-93		
Solids	S	QC I	Level I QC Package			

L14247-3	DPG593S45	26-MAY-93	27-MAY-93	PA	08-JUN-93	

Level 1 QC; Analyze for HMX, RDX, TNT & DNT

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:22-NOV-93		
Water	C	AS	Arsenic	Expires:22-NOV-93		
Water	C	BA	Barium	Expires:22-NOV-93		
Water	C	CD	Cadmium	Expires:22-NOV-93		
Water	C	CR	Chromium	Expires:22-NOV-93		
Water	C	HG	Mercury	Expires:22-NOV-93		
Water	C	PB	Lead	Expires:22-NOV-93		
Water	C	SE	Selenium	Expires:22-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:22-NOV-93	may 27	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:09-JUN-93	may 27	1 Contain
Water	S	EXP-NITRO	Nitroglycerin	Expires:09-JUN-93		
Water	S	QC I	Level I QC Package			

L14247-4	DPG593S46	26-MAY-93	27-MAY-93	PA	08-JUN-93	

Level 1 QC; Analyze for HMX, RDX, TNT & DNT

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:22-NOV-93		
Water	C	AS	Arsenic	Expires:22-NOV-93		
Water	C	BA	Barium	Expires:22-NOV-93		
Water	C	CD	Cadmium	Expires:22-NOV-93		
Water	C	CR	Chromium	Expires:22-NOV-93		
Water	C	HG	Mercury	Expires:22-NOV-93		
Water	C	PB	Lead	Expires:22-NOV-93		
Water	C	SE	Selenium	Expires:22-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:22-NOV-93	may 27	1 Contain

LOGIN CHAIN OF CUSTODY REPORT (ln01)
May 27 1993, 10:34 am

Login Number: L14247
Account: KLE100 Kleinfelder
Site : DUGWAY 08/00

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
Water	S	EXP-CYC	Cyclic Explosives	Expires:09-JUN-93	may 27		1 Contain
Water	S	EXP-NITRO	Nitroglycerin	Expires:09-JUN-93			
Water	S	QC I	Level I QC Package				
L14247-5		DPG593S47		26-MAY-93	27-MAY-93	PA 08-JUN-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:22-NOV-93			
Water	C	AS	Arsenic	Expires:22-NOV-93			
Water	C	BA	Barium	Expires:22-NOV-93			
Water	C	CD	Cadmium	Expires:22-NOV-93			
Water	C	CR	Chromium	Expires:22-NOV-93			
Water	C	HG	Mercury	Expires:22-NOV-93			
Water	C	PB	Lead	Expires:22-NOV-93			
Water	C	SE	Selenium	Expires:22-NOV-93			
Water	S	DIG-MET	Total Metal Digestion	Expires:22-NOV-93	may 27		1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:09-JUN-93	may 27		1 Contain
Water	S	EXP-NITRO	Nitroglycerin	Expires:09-JUN-93			
Water	S	QC I	Level I QC Package				
Water	S	SEMI-F&D	F&D list semivolatiles	Expires:02-JUN-93	hall		1 Contain
Water	S	VOC-F&D	F&D list volatiles	Expires:09-JUN-93	jerry		2 Contain
L14247-6		DPG593S48		26-MAY-93	27-MAY-93	PA 08-JUN-93	
Level 1 QC; Analyze for HMX, RDX, TNT & DNT							
Water	P	D LIST METALS	8 RCRA				
Water	C	AG	Silver	Expires:22-NOV-93			
Water	C	AS	Arsenic	Expires:22-NOV-93			
'ater	C	BA	Barium	Expires:22-NOV-93			
ater	C	CD	Cadmium	Expires:22-NOV-93			
Water	C	CR	Chromium	Expires:22-NOV-93			
Water	C	HG	Mercury	Expires:22-NOV-93			
Water	C	PB	Lead	Expires:22-NOV-93			
Water	C	SE	Selenium	Expires:22-NOV-93			
Water	S	DIG-MET	Total Metal Digestion	Expires:22-NOV-93	may 27		1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:09-JUN-93	may 27		1 Contain
Water	S	EXP-NITRO	Nitroglycerin	Expires:09-JUN-93			
Water	S	QC I	Level I QC Package				
Water	S	SEMI-F&D	F&D list semivolatiles	Expires:02-JUN-93	hall		1 Contain
Water	S	VOC-F&D	F&D list volatiles	Expires:09-JUN-93	jerry		2 Contain

Signature: ____________________

Date: ____________________

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 8/4/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
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LABORATORIES

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-01
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG593S43

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: _______________
Laboratory Supervisor

Report Date 6/11/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Released by: ____________
Laboratory Supervisor

Report Date 8/4/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-02
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG593S44

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.3
Barium	6010	0.5	160.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	6.4
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Released by:
Laboratory Supervisor

Report Date 6/11/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-03
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG593S45

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 6/11/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-04
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG593S46

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: [signature]
Laboratory Supervisor

Report Date 6/11/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-05
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG593S47

Contact: Roy McDonald
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.045
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Released by: ______________________
Laboratory Supervisor

Report Date 6/11/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 27, 1993
Lab Sample ID Number: 14247-06
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG593S48

Contact: Roy McDonald
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.047
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 6/11/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 26, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 29, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number: 14247-Method Blank

Field Sample ID. Number: Method Blank (Solid)

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25
Nitroglycerin	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/10/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 26, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 29, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number: 14247-02

Field Sample ID. Number: Project #30-2025-14.001/Dugway OB/OD/DPG593S44

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25
Nitroglycerin	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 24, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 31, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14247-Method Blank	Method Blank (Water)

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01
Nitroglycerin	0.02	<0.02

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/10/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 24, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 31, 1993
Nitroglycerin	USATHAMA Aug 1989	

Lab Sample ID. Number: 14247-01

Field Sample ID. Number: Project #30-2025-14.001/Dugway OB/OD/DPG593S43

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01
Nitroglycerin	0.02	<0.02

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 26, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 31, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number: 14247-03

Field Sample ID. Number: Project #30-2025-14.001/Dugway OB/OD/DPG593S45

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01
Nitroglycerin	0.02	<0.02

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 26, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 31, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:
14247-04

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG593S46

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01
Nitroglycerin	0.02	<0.02

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 26, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 31, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:
14247-05

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG593S47

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01
Nitroglycerin	0.02	<0.02

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.
T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder
Date Sampled: May 26, 1993
Date Received: May 27, 1993
Set Description: Five Water & One Solid Sample

Set Identification #: 14247
Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	May 31, 1993
Nitroglycerin	USATHAMA Aug 1989	

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number: 14247-06

Field Sample ID. Number: Project #30-2025-14.001/Dugway OB/OD/DPG593S48

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01
Nitroglycerin	0.02	<0.02

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: May 27, 1993
Set Identification Number: 14247
Set Description: Five Water & One Solid Sample

Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (Extraction/Direct Injection - GC/MS)	June 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14247-Method Blank	Method Blank

Analytical Results — RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	1.0	<1.0
Isobutyl alcohol	F005	0.5	<0.5
m-Cresol	F004/ D024	0.2	<0.2
o-Cresol	F004/ D023	0.2	<0.2
p-Cresol	F004/ D025	0.2	<0.2
Cyclohexanone	F003	0.1	<0.1
2-Ethoxyethanol	F005	5.0	<5.0
Methanol	F003	0.5	<0.5
Nitrobenzene	D036	0.5	<0.5
Pyridine	F005/ D038	0.1	<0.1
2,4-Dinitrotoluene	D030	0.1	<0.1
Hexachlorobenzene	D032	0.1	<0.1
Hexachloro-1,3-butadiene	D033	0.1	<0.1
Hexachloroethane	D034	0.1	<0.1
Pentachlorophenol	D037	10.0	<10.0
2,4,5-Trichlorophenol	D041	0.1	<0.1
2,4,6-Trichlorophenol	D042	0.1	<0.1

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 6/10/93

AMERICAN WEST ANALYTICAL LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Set Identification Number: 14247
Set Description: Five Water & One Solid Sample

Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (Extraction/Direct Injection - GC/MS)	June 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14247-05	Project #30-2025-14.001/Dugway OB/OD/DPG593S47

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	1.0	<1.0
Isobutyl alcohol	F005	0.5	<0.5
m-Cresol	F004/ D024	0.2	<0.2
o-Cresol	F004/ D023	0.2	<0.2
p-Cresol	F004/ D025	0.2	<0.2
Cyclohexanone	F003	0.1	<0.1
2-Ethoxyethanol	F005	5.0	<5.0
Methanol	F003	0.5	<0.5
Nitrobenzene	D036	0.5	<0.5
Pyridine	F005/ D038	0.1	<0.1
2,4-Dinitrotoluene	D030	0.1	<0.1
Hexachlorobenzene	D032	0.1	<0.1
Hexachloro-1,3-butadiene	D033	0.1	<0.1
Hexachloroethane	D034	0.1	<0.1
Pentachlorophenol	D037	10.0	<10.0
2,4,5-Trichlorophenol	D041	0.1	<0.1
2,4,6-Trichlorophenol	D042	0.1	<0.1

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 6/11/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Set Identification Number: 14247
Set Description: Five Water & One Solid Sample

Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8270 (Extraction/Direct Injection - GC/MS)	June 8, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14247-06	Project #30-2025-14.001/Dugway OB/OD/DPG593S48

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results   RCRA LISTED NON-PURGABLE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Series Listing(s)	Detection Limit:	Amount Detected:
n-Butyl alcohol	F003	1.0	<1.0
Isobutyl alcohol	F005	0.5	<0.5
m-Cresol	F004/ D024	0.2	<0.2
o-Cresol	F004/ D023	0.2	<0.2
p-Cresol	F004/ D025	0.2	<0.2
Cyclohexanone	F003	0.1	<0.1
2-Ethoxyethanol	F005	5.0	<5.0
Methanol	F003	0.5	<0.5
Nitrobenzene	D036	0.5	<0.5
Pyridine	F005/ D038	0.1	<0.1
2,4-Dinitrotoluene	D030	0.1	<0.1
Hexachlorobenzene	D032	0.1	<0.1
Hexachloro-1,3-butadiene	D033	0.1	<0.1
Hexachloroethane	D034	0.1	<0.1
Pentachlorophenol	D037	10.0	<10.0
2,4,5-Trichlorophenol	D041	0.1	<0.1
2,4,6-Trichlorophenol	D042	0.1	<0.1

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: May 27, 1993
Set Identification Number: 14247
Set Description: Five Water & One Solid Sample

Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8240 Cap. Col. (Purge & Trap GC/MS)	May 28, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14247-Method Blank	Method Blank

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Listing(s):	Detection Limit:	Amount Detected:
Acetone	F003	0.040	<0.040
Benzene	F005/ D018	0.040	<0.040
Carbon disulfide	F005	0.040	<0.040
Carbon tetrachloride	F001/ D019	0.040	<0.040
Chlorobenzene	F002/ D021	0.040	<0.040
Cyclohexanone	F003	0.040	<0.040
1,2-Dichlorobenzene	F002	0.10	<0.10
Ethyl acetate	F003	0.040	<0.040
Ethyl benzene	F003	0.040	<0.040
Ethyl ether	F003	0.040	<0.040
Methylene chloride	F001/ F002	0.040	<0.040
Methyl ethyl ketone	F005/ D035	0.040	<0.040
Methyl isobutyl ketone	F003	0.040	<0.040
2 Nitropropane	F005	0.040	<0.040
Tetrachloroethylene	F001/ F002/ D039	0.040	<0.040
Toluene	F005	0.040	<0.040
1,1,1-Trichloroethane	F001/ F002	0.040	<0.040
1,1,2-Trichloroethane	F002	0.040	<0.040
1,1,2-Trichlorotrifluoroethane	F001/ F002	0.040	<0.040
Trichloroethene	F001/ F002/ D040	0.040	<0.040
Trichlorofluoromethane	F001/ F002	0.040	<0.040
Xylenes (total)	F003	0.040	<0.040

Report Date 6/10/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Lab Sample ID. Number:
14247-Method Blank

Field Sample ID. Number:
Method Blank

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Listing(s)	Detection Limit:	Amount Detected:
Chloroform	D022	0.040	<0.040
1,4-Dichlorobenzene	D027	0.040	<0.040
1,2-Dichloroethane	D028	0.040	<0.040
1,1-Dichloroethene	D029	0.040	<0.040
Vinyl Chloride	D043	0.040	<0.040

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Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 6/10/93

ORGANIC ANALYSIS REPORT

AMERICAN
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ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: May 27, 1993
Set Identification Number: 14247
Set Description: Five Water & One Solid Sample

Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8240 Cap. Col. (Purge & Trap GC/MS)	May 28, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14247-05	Project #30-2025-14.001/Dugway OB/OD/DPG593S47

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Listing(s):	Detection Limit:	Amount Detected:
Acetone	F003	0.040	<0.040
Benzene	F005/ D018	0.040	<0.040
Carbon disulfide	F005	0.040	<0.040
Carbon tetrachloride	F001/ D019	0.040	<0.040
Chlorobenzene	F002/ D021	0.040	<0.040
Cyclohexanone	F003	0.040	<0.040
1,2-Dichlorobenzene	F002	0.10	<0.10
Ethyl acetate	F003	0.040	<0.040
Ethyl benzene	F003	0.040	<0.040
Ethyl ether	F003	0.040	<0.040
Methylene chloride	F001/ F002	0.040	<0.040
Methyl ethyl ketone	F005/ D035	0.040	<0.040
Methyl isobutyl ketone	F003	0.040	<0.040
2 Nitropropane	F005	0.040	<0.040
Tetrachloroethylene	F001/ F002/ D039	0.040	<0.040
Toluene	F005	0.040	<0.040
1,1,1-Trichloroethane	F001/ F002	0.040	<0.040
1,1,2-Trichloroethane	F002	0.040	<0.040
1,1,2-Trichlorotrifluoroethane	F001/ F002	0.040	<0.040
Trichloroethene	F001/ F002/ D040	0.040	<0.040
Trichlorofluoromethane	F001/ F002	0.040	<0.040
Xylenes (total)	F003	0.040	<0.040

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Lab Sample ID. Number:
14247-05

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG593S47

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Listing(s)	Detection Limit:	Amount Detected:
Chloroform	D022	0.040	<0.040
1,4-Dichlorobenzene	D027	0.040	<0.040
1,2-Dichloroethane	D028	0.040	<0.040
1,1-Dichloroethene	D029	0.040	<0.040
Vinyl Chloride	D043	0.040	<0.040

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/11/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES
463 West 3600 South
Salt Lake City, Utah
84115
(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: May 27, 1993
Set Identification Number: 14247
Set Description: Five Water & One Solid Sample

Contact: Roy McDonald
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Listed Organic Constituents in Non-Waste Water	EPA SW-846 #8240 Cap. Col. (Purge & Trap GC/MS)	May 28, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14247-06	Project #30-2025-14.001/Dugway OB/OD/DPG593S48

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Listing(s):	Detection Limit:	Amount Detected:
Acetone	F003	0.040	<0.040
Benzene	F005/ D018	0.040	<0.040
Carbon disulfide	F005	0.040	<0.040
Carbon tetrachloride	F001/ D019	0.040	<0.040
Chlorobenzene	F002/ D021	0.040	<0.040
Cyclohexanone	F003	0.040	<0.040
1,2-Dichlorobenzene	F002	0.10	<0.10
Ethyl acetate	F003	0.040	<0.040
Ethyl benzene	F003	0.040	<0.040
Ethyl ether	F003	0.040	<0.040
Methylene chloride	F001/ F002	0.040	<0.040
Methyl ethyl ketone	F005/ D035	0.040	<0.040
Methyl isobutyl ketone	F003	0.040	<0.040
2 Nitropropane	F005	0.040	<0.040
Tetrachloroethylene	F001/ F002/ D039	0.040	<0.040
Toluene	F005	0.040	<0.040
1,1,1-Trichloroethane	F001/ F002	0.040	<0.040
1,1,2-Trichloroethane	F002	0.040	<0.040
1,1,2-Trichlorotrifluoroethane	F001/ F002	0.040	<0.040
Trichloroethene	F001/ F002/ D040	0.040	<0.040
Trichlorofluoromethane	F001/ F002	0.040	<0.040
Xylenes (total)	F003	0.040	<0.040

Report Date 6/11/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Lab Sample ID. Number:
14247-06

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG593S48

Analytical Results — RCRA VOLATILE WASTE CONSTITUENTS

Units = mg/L (ppm)

Compound:	Listing(s)	Detection Limit:	Amount Detected:
Chloroform	D022	0.040	<0.040
1,4-Dichlorobenzene	D027	0.040	<0.040
1,2-Dichloroethane	D028	0.040	<0.040
1,1-Dichloroethene	D029	0.040	<0.040
Vinyl Chloride	D043	0.040	<0.040

463 West 3600 South
Salt Lake City, Utah
84115

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< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due *to interferences.*

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/11/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Sample Number: 14247

Contact: Roy McDonald
Received By: Elona Hayward
Set Description: Five Water & One Solid Sample

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14241-10	Benzene	0.0	0.020	0.0179	0.0181	89.5	90.5	-1.1
14241-10	Chlorobenzene	0.0	0.020	0.0178	0.0164	89.0	82.0	8.2
14241-10	1,2-Dichloroethane	0.0	0.020	0.0187	0.0186	93.5	93.0	0.5
14241-10	Toluene	0.0	0.020	0.0170	0.0170	85.0	85.0	0.0
14241-10	Trichloroethene	0.0	0.020	0.0205	0.0215	102.5	107.5	-4.8
14245-01	RDX	0.0	10.0	8.3	7.7	83.	77.	7.5
14245-01	Nitroglycerin	0.0	9.0	6.5	7.1	72.	79.	-8.8

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: [signature]
Laboratory Supervisor

Report Date 6/10/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Sample Number: 14247

Contact: Roy McDonald
Received By: Elona Hayward
Set Description: Five Water & One Solid Sample

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14247-06	n-Butanol	0.0	287.6	19.1	24.8	6.6	8.6	-26.0
14247-06	Cyclohexanone	0.0	282.5	273.0	281.9	96.6	99.8	-3.2
14247-06	2,4-Dinitrotoluene	0.0	224.5	226.0	263.9	118.5	117.6	0.8
14247-06	Pentachlorophenol	0.0	262.0	51.4	61.2	19.6	23.4	-17.4
14247-06	Pyridine	0.0	260.4	81.9	106.3	31.5	40.8	-26.

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100$$

$$\%SR = \frac{(SSR - SR)}{SA} * 100$$

$$\%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Laboratory Supervisor

Report Date 6/10/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: May 27, 1993
Sample Number: 14247

Contact: Roy McDonald
Received By: Elona Hayward
Set Description: Five Water & One Solid Sample

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14245-11	Arsenic	4.1	3.35	6.5	6.6	71.6	74.6	-1.5
14247-01	Barium	0.0	1.1	1.06	1.05	96.4	95.5	0.9
14247-01	Cadmium	0.0	1.1	1.13	1.10	102.7	100.0	2.7
14247-01	Chromium	0.0	1.1	1.12	1.11	101.8	100.9	0.9
14247-01	Lead	0.0	1.1	0.98	1.00	89.1	90.9	-2.0
14247-01	Mercury	0.0	0.05	0.047	0.048	94.0	96.0	-2.1
14245-11	Selenium	0.0	3.35	2.4	2.5	71.6	74.6	-4.1
14247-01	Silver	0.0	1.1	1.07	1.05	97.3	95.5	1.9

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: [signature] Laboratory Supervisor

Report Date 6/10/93

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 02 1993, 08:20 am

Login Number: L14298
Account: KLE100 Kleinfelder
Site :

QC I/ II III

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14298-1		DPG-593-S49		27-MAY-93	02-JUN-93	PA	11-JUN-93

Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:23-NOV-93		
Water	C	AS	Arsenic	Expires:23-NOV-93		
Water	C	BA	Barium	Expires:23-NOV-93		
Water	C	CD	Cadmium	Expires:23-NOV-93		
Water	C	CR	Chromium	Expires:23-NOV-93		
Water	C	HG	Mercury	Expires:23-NOV-93		
Water	C	PB	Lead	Expires:23-NOV-93		
Water	C	SE	Selenium	Expires:23-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93	june 2	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2	1 Contain
Water	S	QC I	Level I QC Package			

L14298-2	DPG-593-S50		27-MAY-93	02-JUN-93	PA	11-JUN-93

Share this sample. Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:23-NOV-93		
Solids	C	AS	Arsenic	Expires:23-NOV-93		
Solids	C	BA	Barium	Expires:23-NOV-93		
Solids	C	CD	Cadmium	Expires:23-NOV-93		
Solids	C	CR	Chromium	Expires:23-NOV-93		
Solids	C	HG	Mercury	Expires:23-NOV-93		
Solids	C	PB	Lead	Expires:23-NOV-93		
Solids	C	SE	Selenium	Expires:23-NOV-93		
ids	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93		
ids	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2	1 Contain
lids	S	QC I	Level I QC Package			

L14298-3	DPG-593-S51		27-MAY-93	02-JUN-93	PA	11-JUN-93

Share this sample. Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:23-NOV-93		
Solids	C	AS	Arsenic	Expires:23-NOV-93		
Solids	C	BA	Barium	Expires:23-NOV-93		
Solids	C	CD	Cadmium	Expires:23-NOV-93		
Solids	C	CR	Chromium	Expires:23-NOV-93		
Solids	C	HG	Mercury	Expires:23-NOV-93		
Solids	C	PB	Lead	Expires:23-NOV-93		
Solids	C	SE	Selenium	Expires:23-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2	1 Contain
Solids	S	QC I	Level I QC Package			

L14298-4	DPG-593-S52		27-MAY-93	02-JUN-93	PA	11-JUN-93

Share this sample. Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:23-NOV-93		
Solids	C	AS	Arsenic	Expires:23-NOV-93		
Solids	C	BA	Barium	Expires:23-NOV-93		
Solids	C	CD	Cadmium	Expires:23-NOV-93		
Solids	C	CR	Chromium	Expires:23-NOV-93		
Solids	C	HG	Mercury	Expires:23-NOV-93		
Solids	C	PB	Lead	Expires:23-NOV-93		
Solids	C	SE	Selenium	Expires:23-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2	1 Contain
Solids	S	QC I	Level I QC Package			

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 02 1993, 08:20 am

Login Number: L14298
Account: KLE100 Kleinfelder
Site :

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
L14298-5		DPG-593-S53	-	27-MAY-93	02-JUN-93	PA	11-JUN-93	
Share this sample. Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:23-NOV-93				
Solids	C	AS	Arsenic	Expires:23-NOV-93				
Solids	C	BA	Barium	Expires:23-NOV-93				
Solids	C	CD	Cadmium	Expires:23-NOV-93				
Solids	C	CR	Chromium	Expires:23-NOV-93				
Solids	C	HG	Mercury	Expires:23-NOV-93				
Solids	C	PB	Lead	Expires:23-NOV-93				
Solids	C	SE	Selenium	Expires:23-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93				
Solids	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2			1 Contain
Solids	S	QC I	Level I QC Package					
L14298-6		DPG-593-S54		27-MAY-93	02-JUN-93	PA	11-JUN-93	
Share this sample. Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:23-NOV-93				
Solids	C	AS	Arsenic	Expires:23-NOV-93				
Solids	C	BA	Barium	Expires:23-NOV-93				
Solids	C	CD	Cadmium	Expires:23-NOV-93				
Solids	C	CR	Chromium	Expires:23-NOV-93				
Solids	C	HG	Mercury	Expires:23-NOV-93				
Solids	C	PB	Lead	Expires:23-NOV-93				
Solids	C	SE	Selenium	Expires:23-NOV-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93				
Solids	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2			1 Contain
olids	S	QC I	Level I QC Package					
L14298-7		DPG-593-S55		27-MAY-93	02-JUN-93	PA	11-JUN-93	
Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:23-NOV-93				
Water	C	AS	Arsenic	Expires:23-NOV-93				
Water	C	BA	Barium	Expires:23-NOV-93				
Water	C	CD	Cadmium	Expires:23-NOV-93				
Water	C	CR	Chromium	Expires:23-NOV-93				
Water	C	HG	Mercury	Expires:23-NOV-93				
Water	C	PB	Lead	Expires:23-NOV-93				
Water	C	SE	Selenium	Expires:23-NOV-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93	june 2			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2			1 Contain
Water	S	QC I	Level I QC Package					
L14298-8		DPG-593-S56		27-MAY-93	02-JUN-93	PA	11-JUN-93	
Explosives: TNT,DNT,HMX,& RDX. Level I QC. Contact: Joel Carsen								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:23-NOV-93				
Water	C	AS	Arsenic	Expires:23-NOV-93				
Water	C	BA	Barium	Expires:23-NOV-93				
Water	C	CD	Cadmium	Expires:23-NOV-93				
Water	C	CR	Chromium	Expires:23-NOV-93				
Water	C	HG	Mercury	Expires:23-NOV-93				
Water	C	PB	Lead	Expires:23-NOV-93				
Water	C	SE	Selenium	Expires:23-NOV-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:23-NOV-93	june 2			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:10-JUN-93	june 2			1 Contain
Water	S	QC I	Level I QC Package					

Signature: ______________________________

Date: ______________________________

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 7/28/93

AMERICAN
WEST
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-01
Field Sample ID: Project #30-2025-14.001/DPG-593-S49

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date 6/9/93

AMERICAN
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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

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Laboratory Supervisor

Report Date 7/28/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-02
Field Sample ID: Project #30-2025-14.001/DPG-593-S50

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.4
Barium	6010	0.5	170.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	13.
Lead	6010	3.0	6.6
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.8

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Laboratory Supervisor

Report Date 6/9/93

INORGANIC ANALYSIS REPORT

AMERICAN
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ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-03
Field Sample ID: Project #30-2025-14.001/DPG-593-S51

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.0
Barium	6010	0.5	180.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	15.
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.6

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Laboratory Supervisor

Report Date 6/9/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-04
Field Sample ID: Project #30-2025-14.001/DPG-593-S52

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.5
Barium	6010	0.5	220.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	15.
Lead	6010	3.0	5.8
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.8

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Laboratory Supervisor

Report Date 6/9/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-05
Field Sample ID: Project #30-2025-14.001/DPG-593-S53

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	0.8
Barium	6010	0.5	120.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	19.
Lead	6010	3.0	6.8
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.3

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Laboratory Supervisor

Report Date 6/9/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
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LABORATORIES

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-06
Field Sample ID: Project #30-2025-14.001/DPG-593-S54

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.9
Barium	6010	0.5	37.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	5.2
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	<0.5

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Laboratory Supervisor

Report Date 6/9/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-07
Field Sample ID: Project #30-2025-14.001/DPG-593-S55

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.003
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 6/9/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 2, 1993
Lab Sample ID Number: 14298-08
Field Sample ID: Project #30-2025-14.001/DPG-593-S56

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.005**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date 6/9/93

AMERICAN
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ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/9/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-02	Project #30-2025-14.001/DPG-593-S50

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 6/9/93

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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number: 14298-03

Field Sample ID. Number: Project #30-2025-14.001/DPG-593-S51

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/9/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-04	Project #30-2025-14.001/DPG-593-S52

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/9/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-05	Project #30-2025-14.001/DPG-593-S53

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/9/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-06	Project #30-2025-14.001/DPG-593-S54

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 6/9/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-Method Blank	Method Blank (Water)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 6/9/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-01	Project #30-2025-14.001/DPG-593-S49

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/9/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-07	Project #30-2025-14.001/DPG-593-S55

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by:
Laboratory Supervisor

Report Date 6/9/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 27, 1993
Date Received: June 2, 1993
Set Description: Five Solid & Three Water Samples

Set Identification #: 14298
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14298-08	Project #30-2025-14.001/DPG-593-S56

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/9/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 2, 1993
Sample Number: 14298

Contact: Joel Carson
Received By: Elona Hayward
Set Description: Five Solid & Three Water Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14298-01	Arsenic	0.0	0.067	0.073	0.074	109.0	110.4	-1.4
14286-01	Barium	145.	55.	200.	198.	100.0	96.4	1.0
14286-01	Cadmium	1.2	55.	52.6	51.6	93.5	91.6	1.9
14286-01	Chromium	12.	55.	62.2	61.9	91.3	90.7	0.5
14286-01	Lead	0.0	55.	48.0	51.8	87.3	94.2	-7.6
14155-01	Mercury	0.011	0.005	0.016	0.017	100.0	120.0	-6.1
14298-01	Selenium	0.0	0.067	0.062	0.064	92.5	95.5	-3.2
14286-01	Silver	2.9	55.	57.6	57.0	99.5	98.4	1.0
14298-02	RDX	0.0	10.0	8.7	8.3	87.	83.	4.7

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________
Laboratory Supervisor

Report Date 6/9/93

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 04 1993, 03:52 pm

Login Number: L14335
Account: KLE100 Kleinfelder
Site :

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14335-1	DPG-693-S57		01-JUN-93	04-JUN-93	PA	14-JUN-93

Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA		june 4	1 Contain
Water	C	AG	Silver	Expires:28-NOV-93		
Water	C	AS	Arsenic	Expires:28-NOV-93		
Water	C	BA	Barium	Expires:28-NOV-93		
Water	C	CD	Cadmium	Expires:28-NOV-93		
Water	C	CR	Chromium	Expires:28-NOV-93		
Water	C	HG	Mercury	Expires:28-NOV-93		
Water	C	PB	Lead	Expires:28-NOV-93		
Water	C	SE	Selenium	Expires:28-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:28-NOV-93		
Water	S	EXP-CYC	Cyclic Explosives	Expires:15-JUN-93	june 4	1 Contain
Water	S	QC I	Level I QC Package			

L14335-2	DPG-693-S58		02-JUN-93	04-JUN-93	PA	14-JUN-93

Share sample Rich & Metals. Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:29-NOV-93		
Solids	C	AS	Arsenic	Expires:29-NOV-93		
Solids	C	BA	Barium	Expires:29-NOV-93		
Solids	C	CD	Cadmium	Expires:29-NOV-93		
Solids	C	CR	Chromium	Expires:29-NOV-93		
Solids	C	HG	Mercury	Expires:29-NOV-93		
Solids	C	PB	Lead	Expires:29-NOV-93		
olids	C	SE	Selenium	Expires:29-NOV-93		
lids	S	DIG-MET	Total Metal Digestion	Expires:29-NOV-93	june 4	1 Contain
lids	S	EXP-CYC	Cyclic Explosives	Expires:16-JUN-93		
lids	S	QC I	Level I QC Package			

L14335-3	DPG-693-S59		03-JUN-93	04-JUN-93	PA	14-JUN-93

Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA		june 4	1 Contain
Water	C	AG	Silver	Expires:30-NOV-93		
Water	C	AS	Arsenic	Expires:30-NOV-93		
Water	C	BA	Barium	Expires:30-NOV-93		
Water	C	CD	Cadmium	Expires:30-NOV-93		
Water	C	CR	Chromium	Expires:30-NOV-93		
Water	C	HG	Mercury	Expires:30-NOV-93		
Water	C	PB	Lead	Expires:30-NOV-93		
Water	C	SE	Selenium	Expires:30-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:30-NOV-93		
Water	S	EXP-CYC	Cyclic Explosives	Expires:17-JUN-93	june 4	1 Contain
Water	S	QC I	Level I QC Package			

L14335-4	DPG-693-S60		03-JUN-93	04-JUN-93	PA	14-JUN-93

Share sample Rich & Metals. Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:30-NOV-93		
Solids	C	AS	Arsenic	Expires:30-NOV-93		
Solids	C	BA	Barium	Expires:30-NOV-93		
Solids	C	CD	Cadmium	Expires:30-NOV-93		
Solids	C	CR	Chromium	Expires:30-NOV-93		
Solids	C	HG	Mercury	Expires:30-NOV-93		
Solids	C	PB	Lead	Expires:30-NOV-93		
Solids	C	SE	Selenium	Expires:30-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:30-NOV-93	june 4	1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:17-JUN-93		
Solids	S	QC I	Level I QC Package			

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 04 1993, 03:52 pm

Login Number: L14335
Account: KLE100 Kleinfelder
Site :

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date		
L14335-5		DPG-693-S61	-	03-JUN-93	04-JUN-93 PA	14-JUN-93		

Share sample Rich & Metals. Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:30-NOV-93		
Solids	C	AS	Arsenic	Expires:30-NOV-93		
Solids	C	BA	Barium	Expires:30-NOV-93		
Solids	C	CD	Cadmium	Expires:30-NOV-93		
Solids	C	CR	Chromium	Expires:30-NOV-93		
Solids	C	HG	Mercury	Expires:30-NOV-93		
Solids	C	PB	Lead	Expires:30-NOV-93		
Solids	C	SE	Selenium	Expires:30-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:30-NOV-93	june 4	1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:17-JUN-93		
Solids	S	QC I	Level I QC Package			

L14335-6 DPG-693-S62 03-JUN-93 04-JUN-93 PA 14-JUN-93

Share sample,Rich & Metals. Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:30-NOV-93		
Solids	C	AS	Arsenic	Expires:30-NOV-93		
Solids	C	BA	Barium	Expires:30-NOV-93		
Solids	C	CD	Cadmium	Expires:30-NOV-93		
Solids	C	CR	Chromium	Expires:30-NOV-93		
Solids	C	HG	Mercury	Expires:30-NOV-93		
Solids	C	PB	Lead	Expires:30-NOV-93		
Solids	C	SE	Selenium	Expires:30-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:30-NOV-93	june 4	1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:17-JUN-93		
olids	S	QC I	Level I QC Package			

L14335-7 DPG-693-S63 03-JUN-93 04-JUN-93 PA 14-JUN-93

Share Sample Rich & Metals. Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:30-NOV-93		
Solids	C	AS	Arsenic	Expires:30-NOV-93		
Solids	C	BA	Barium	Expires:30-NOV-93		
Solids	C	CD	Cadmium	Expires:30-NOV-93		
Solids	C	CR	Chromium	Expires:30-NOV-93		
Solids	C	HG	Mercury	Expires:30-NOV-93		
Solids	C	PB	Lead	Expires:30-NOV-93		
Solids	C	SE	Selenium	Expires:30-NOV-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:30-NOV-93	june 4	1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:17-JUN-93		
Solids	S	QC I	Level I QC Package			

L14335-8 DPG-693-S64 03-JUN-93 04-JUN-93 PA 14-JUN-93

Level I QC;Explosives: TNT,DNT, HMX, & RDX. Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA		june 4	1 Contain
Water	C	AG	Silver	Expires:30-NOV-93		
Water	C	AS	Arsenic	Expires:30-NOV-93		
Water	C	BA	Barium	Expires:30-NOV-93		
Water	C	CD	Cadmium	Expires:30-NOV-93		
Water	C	CR	Chromium	Expires:30-NOV-93		
Water	C	HG	Mercury	Expires:30-NOV-93		
Water	C	PB	Lead	Expires:30-NOV-93		
Water	C	SE	Selenium	Expires:30-NOV-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:30-NOV-93		
Water	S	EXP-CYC	Cyclic Explosives	Expires:17-JUN-93	june 4	1 Contain
Water	S	QC I	Level I QC Package			

Signature: ____________________

Date: ____________________

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Released by:
Laboratory Supervisor

Report Date 7/28/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-01
Field Sample ID: Project #30-2025-14.001/DPG-693-S57

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-03
Field Sample ID: Project #30-2025-14.001/DPG-693-S59

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-08
Field Sample ID: Project #30-2025-14.001/DPG-693-S64

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

463 West 3600 South
Salt Lake City, Utah
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Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 7/28/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-02
Field Sample ID: Project #30-2025-14.001/DPG-693-S58

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.6
Barium	6010	0.5	120.
Cadmium	6010	0.2	0.5
Chromium	6010	0.5	15.
Lead	6010	3.0	11.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.0

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-04
Field Sample ID: Project #30-2025-14.001/DPG-693-S60

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.3
Barium	6010	0.5	200.
Cadmium	6010	0.2	0.5
Chromium	6010	0.5	15.
Lead	6010	3.0	6.4
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.5

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-05
Field Sample ID: Project #30-2025-14.001/DPG-693-S61

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

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Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.1
Barium	6010	0.5	210.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	18.
Lead	6010	3.0	9.3
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	2.5

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

INORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES
463 West 3600 South
Salt Lake City, Utah
84115
(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-06
Field Sample ID: Project #30-2025-14.001/DPG-693-S62

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.4
Barium	6010	0.5	300.
Cadmium	6010	0.2	0.6
Chromium	6010	0.5	14.
Lead	6010	3.0	9.6
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	0.2
Silver	6010	0.5	3.2

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 4, 1993
Lab Sample ID Number: 14335-07
Field Sample ID: Project #30-2025-14.001/DPG-693-S63

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.0
Barium	6010	0.5	99.
Cadmium	6010	0.2	0.4
Chromium	6010	0.5	21.
Lead	6010	3.0	11.
Mercury	7471	0.1	0.1
Selenium	7740	0.1	0.1
Silver	6010	0.5	2.7

463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
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Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: June 1, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-Method Blank	Method Blank (Water)

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 6/14/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 1, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-01	Project #30-2025-14.001/DPG-693-S57

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 3, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-03	Project #30-2025-14.001/DPG-693-S59

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/17/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 3, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 4, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-08	Project #30-2025-14.001/DPG-693-S64

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/17/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: June 1, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-Method Blank	Method Blank (Solid)

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/14/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 2, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-02	Project #30-2025-14.001/DPG-693-S58

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/17/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: June 3, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-04	Project #30-2025-14.001/DPG-693-S60

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/17/93

AMERICAN
WEST
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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 3, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-05	Project #30-2025-14.001/DPG-693-S61

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/17/93

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 3, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-06	Project #30-2025-14.001/DPG-693-S62

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/17/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
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LABORATORIES

Client: Kleinfelder
Date Sampled: June 3, 1993
Date Received: June 4, 1993
Set Description: Three Water & Five Solid Samples

Set Identification #: 14335
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 7, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14335-07	Project #30-2025-14.001/DPG-693-S63

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/17/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 4, 1993
Sample Number: 14335

Contact: Joel Carson
Received By: Elona Hayward
Set Description: Three Water & Five Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14350-01	Arsenic	0.034	0.067	0.095	0.102	91.0	101.5	-7.1
14328-01	Barium	21.	55.	81.0	81.3	109.1	109.6	-0.4
14328-01	Cadmium	0.4	55.	60.5	60.7	109.3	109.6	-0.3
14328-01	Chromium	0.5	55.	59.5	59.7	107.3	107.6	-0.3
14328-01	Lead	19.	55.	79.6	81.5	110.2	113.6	-2.4
14310-01	Mercury	0.009	0.050	0.046	0.046	74.0	74.0	0.0
14350-01	Selenium	0.0	0.067	0.050	0.049	74.6	73.1	2.0
14328-01	Silver	0.0	55.	55.6	56.1	101.1	102.0	-0.9
14335-02	RDX	0.0	10.0	7.8	7.6	78.	76.	2.6

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 6/14/93

QC I

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 08 1993, 02:05 pm

Login Number: L14359
Account: KLE100 Kleinfelder
Site :

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14359-1	DPG 693 S65		04-JUN-93	08-JUN-93	PA	17-JUN-93

Level I QC/Explosives: TNT, DNT, HMX, RDX/Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:01-DEC-93		
Water	C	AS	Arsenic	Expires:01-DEC-93		
Water	C	BA	Barium	Expires:01-DEC-93		
Water	C	CD	Cadmium	Expires:01-DEC-93		
Water	C	CR	Chromium	Expires:01-DEC-93		
Water	C	HG	Mercury	Expires:01-DEC-93		
Water	C	PB	Lead	Expires:01-DEC-93		
Water	C	SE	Selenium	Expires:01-DEC-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:01-DEC-93	june 8	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:18-JUN-93	june 8	1 Contain
Water	S	QC I	Level I QC Package			

L14359-2	DPG 693 S66		04-JUN-93	08-JUN-93	PA	17-JUN-93

Share sample, Rich & Metals. Level I QC/Explosives: TNT, DNT, HMX, RDX/Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:01-DEC-93		
Solids	C	AS	Arsenic	Expires:01-DEC-93		
Solids	C	BA	Barium	Expires:01-DEC-93		
Solids	C	CD	Cadmium	Expires:01-DEC-93		
Solids	C	CR	Chromium	Expires:01-DEC-93		
Solids	C	HG	Mercury	Expires:01-DEC-93		
Solids	C	PB	Lead	Expires:01-DEC-93		
ids	C	SE	Selenium	Expires:01-DEC-93		
ds	S	DIG-MET	Total Metal Digestion	Expires:01-DEC-93		
ids	S	EXP-CYC	Cyclic Explosives	Expires:18-JUN-93	june 8	1 Contain
ids	S	QC I	Level I QC Package			

L14359-3	DPG 693 S67		04-JUN-93	08-JUN-93	PA	17-JUN-93

Level I QC/Explosives: TNT, DNT, HMX, RDX/Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:01-DEC-93		
Water	C	AS	Arsenic	Expires:01-DEC-93		
Water	C	BA	Barium	Expires:01-DEC-93		
Water	C	CD	Cadmium	Expires:01-DEC-93		
Water	C	CR	Chromium	Expires:01-DEC-93		
Water	C	HG	Mercury	Expires:01-DEC-93		
Water	C	PB	Lead	Expires:01-DEC-93		
Water	C	SE	Selenium	Expires:01-DEC-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:01-DEC-93	june 8	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:18-JUN-93	june 8	1 Contain
Water	S	QC I	Level I QC Package			

L14359-4	DPG 693 S68		04-JUN-93	08-JUN-93	PA	17-JUN-93

Level I QC/Explosives: TNT, DNT, HMX, RDX/Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA			
Water	C	AG	Silver	Expires:01-DEC-93		
Water	C	AS	Arsenic	Expires:01-DEC-93		
Water	C	BA	Barium	Expires:01-DEC-93		
Water	C	CD	Cadmium	Expires:01-DEC-93		
Water	C	CR	Chromium	Expires:01-DEC-93		
Water	C	HG	Mercury	Expires:01-DEC-93		
Water	C	PB	Lead	Expires:01-DEC-93		
Water	C	SE	Selenium	Expires:01-DEC-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:01-DEC-93	june 8	1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:18-JUN-93	june 8	1 Contain
Water	S	QC I	Level I QC Package			

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 08 1993, 01:57 pm

Login Number: L14359
Account: KLE100 Kleinfelder
Site :

Laboratory Sample Number			Client Sample Number	Method Description		Collect Date	Receive Date	Due Date	
L14359-5			DPG 693 S68 69.			04-JUN-93	08-JUN-93 PA	17-JUN-93	
Level I QC/Explosives: TNT, DNT, HMX, RDX/Contact: Joel Carson									
Water	P	D LIST METALS		8 RCRA					
Water	C	AG		Silver	Expires:01-DEC-93				
Water	C	AS		Arsenic	Expires:01-DEC-93				
Water	C	BA		Barium	Expires:01-DEC-93				
Water	C	CD		Cadmium	Expires:01-DEC-93				
Water	C	CR		Chromium	Expires:01-DEC-93				
Water	C	HG		Mercury	Expires:01-DEC-93				
Water	C	PB		Lead	Expires:01-DEC-93				
Water	C	SE		Selenium	Expires:01-DEC-93				
Water	S	DIG-MET		Total Metal Digestion	Expires:01-DEC-93	june 8			1 Contain
Water	S	EXP-CYC		Cyclic Explosives	Expires:18-JUN-93	june 8			1 Contain
Water	S	QC I	70	Level I QC Package					
L14359-6			DPG 693 S65			04-JUN-93	08-JUN-93 PA	17-JUN-93	
Share sample, Rich & Metals. Level I QC/Explosives: TNT, DNT, HMX, RDX/Contact: Joel Carson									
Solids	P	D LIST METALS		8 RCRA					
Solids	C	AG		Silver	Expires:01-DEC-93				
Solids	C	AS		Arsenic	Expires:01-DEC-93				
Solids	C	BA		Barium	Expires:01-DEC-93				
Solids	C	CD		Cadmium	Expires:01-DEC-93				
Solids	C	CR		Chromium	Expires:01-DEC-93				
Solids	C	HG		Mercury	Expires:01-DEC-93				
Solids	C	PB		Lead	Expires:01-DEC-93				
Solids	C	SE		Selenium	Expires:01-DEC-93				
Solids	S	DIG-MET		Total Metal Digestion	Expires:01-DEC-93				
Solids	S	EXP-CYC		Cyclic Explosives	Expires:18-JUN-93	june 8			1 Contain
Solids	S	QC I		Level I QC Package					

Signature: ______________________

Date: ______________________

AMERICAN
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ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-01
Field Sample ID: Project #30-2025-14.001/DPG 693 S65

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 6/15/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

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Laboratory Supervisor

Report Date 8/4/93

AMERICAN
WEST
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-02
Field Sample ID: Project #30-2025-14.001/DPG 693 S66

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.4
Barium	6010	0.5	23.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	4.5
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.1

Released by: ____________________
Laboratory Supervisor

Report Date 6/15/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-03
Field Sample ID: Project #30-2025-14.001/DPG 693 S67

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.12
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 6/15/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-04
Field Sample ID: Project #30-2025-14.001/DPG 693 S68

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date 6/15/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-05
Field Sample ID: Project #30-2025-14.001/DPG 693 S69

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date 6/15/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 8, 1993
Lab Sample ID Number: 14359-06
Field Sample ID: Project #30-2025-14.001/DPG 693 S70

Contact: Joel Carson
Received By: Elona Hayward

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	2.9
Barium	6010	0.5	140.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	5.3
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.3

Released by: ______________________
Laboratory Supervisor

Report Date 6/16/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14359-Method Blank	Method Blank (Water)

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________
Laboratory Supervisor

Report Date 6/15/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number: 14359-01

Field Sample ID. Number: Project #30-2025-14.001/DPG 693 S65

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/15/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number: 14359-03

Field Sample ID. Number: Project #30-2025-14.001/DPG 693 S67

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/15/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14359-04	Project #30-2025-14.001/DPG 693 S68

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/15/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14359-05	Project #30-2025-14.001/DPG 693 S69

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/15/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14359-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: Laboratory Supervisor

Report Date 6/15/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14359-02	Project #30-2025-14.001/DPG 693 S66

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 4, 1993
Date Received: June 8, 1993
Set Description: Four Water & Two Solid Samples

Set Identification #: 14359
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number: 14359-06

Field Sample ID. Number: Project #30-2025-14.001/DPG 693 S70

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/15/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 8, 1993
Sample Number: 14359

Contact: Joel Carson
Received By: Elona Hayward
Set Description: Four Water & Two Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14330-01	Arsenic	0.0	0.067	0.051	0.056	76.1	83.6	-9.3
13368-09	Barium	0.0	1.1	1.09	1.10	99.1	100.0	-0.9
13368-09	Cadmium	0.0	1.1	1.17	1.17	106.4	106.4	0.0
13368-09	Chromium	0.0	1.1	1.15	1.15	104.5	104.5	0.0
13368-09	Lead	0.0	1.1	1.16	1.17	105.5	106.4	-0.9
14359-01	Mercury	0.0	0.005	0.0045	0.0048	90.0	96.0	-6.5
14350-01	Selenium	0.0	0.067	0.050	0.049	74.6	73.1	2.0
13368-09	Silver	0.0	1.1	1.10	1.12	100.0	101.8	-1.8
14359-06	RDX	0.0	10.2	9.33	9.30	91.5	91.2	0.3

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100$$

$$\%SR = \frac{(SSR - SR)}{SA} * 100$$

$$\%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 6/15/93

QC (1) II III

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 09 1993, 09:06 am

Login Number: L14368
Account: KLE100 Kleinfelder
Site : DUGWAY 08/OD 30-2025-14.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date		Due PR Date

L14368-1 DPG693S71 — 08-JUN-93 09-JUN-93 PA 18-JUN-93

Contact: Joel Carson/Level I QC/HMX,RDX,TNT,DNT

Water	P	D LIST METALS	8 RCRA		june 9	1 Contain
Water	C	AG	Silver	Expires:05-DEC-93		
Water	C	AS	Arsenic	Expires:05-DEC-93		
Water	C	BA	Barium	Expires:05-DEC-93		
Water	C	CD	Cadmium	Expires:05-DEC-93		
Water	C	CR	Chromium	Expires:05-DEC-93		
Water	C	HG	Mercury	Expires:05-DEC-93		
Water	C	PB	Lead	Expires:05-DEC-93		
Water	C	SE	Selenium	Expires:05-DEC-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:05-DEC-93		
Water	S	EXP-CYC	Cyclic Explosives	Expires:22-JUN-93	june 9	1 Contain
Water	S	QC I	Level I QC Package			

L14368-2 DPG693S72 — 08-JUN-93 09-JUN-93 PA 18-JUN-93

Contact: Joel Carson/Level I QC/HMX,RDX,TNT,DNT

Solids	P	D LIST METALS	8 RCRA		june 9	1 Contain
Solids	C	AG	Silver	Expires:05-DEC-93		
Solids	C	AS	Arsenic	Expires:05-DEC-93		
Solids	C	BA	Barium	Expires:05-DEC-93		
Solids	C	CD	Cadmium	Expires:05-DEC-93		
Solids	C	CR	Chromium	Expires:05-DEC-93		
Solids	C	HG	Mercury	Expires:05-DEC-93		
Solids	C	PB	Lead	Expires:05-DEC-93		
Solids	C	SE	Selenium	Expires:05-DEC-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:05-DEC-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:22-JUN-93	june 9	1 Contain
Solids	S	QC I	Level I QC Package			
Solids	S	SEMI	Semivolatile Analysis	Expires:15-JUN-93	hall	1 Contain
Solids	S	VOC	Volatile Analysis	Expires:22-JUN-93	jerry	1 Contain

L14368-3 DPG693S73 — 08-JUN-93 09-JUN-93 PA 18-JUN-93

Contact: Joel Carson/Level I QC/HMX,RDX,TNT,DNT

Solids	P	D LIST METALS	8 RCRA		june 9	1 Contain
Solids	C	AG	Silver	Expires:05-DEC-93		
Solids	C	AS	Arsenic	Expires:05-DEC-93		
Solids	C	BA	Barium	Expires:05-DEC-93		
Solids	C	CD	Cadmium	Expires:05-DEC-93		
Solids	C	CR	Chromium	Expires:05-DEC-93		
Solids	C	HG	Mercury	Expires:05-DEC-93		
Solids	C	PB	Lead	Expires:05-DEC-93		
Solids	C	SE	Selenium	Expires:05-DEC-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:05-DEC-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:22-JUN-93	june 9	1 Contain
Solids	S	QC I	Level I QC Package			
Solids	S	SEMI	Semivolatile Analysis	Expires:15-JUN-93	hall	1 Contain
Solids	S	VOC	Volatile Analysis	Expires:22-JUN-93	jerry	1 Contain

L14368-4 DPG693S74 — 08-JUN-93 09-JUN-93 PA 18-JUN-93

Contact: Joel Carson/Level I QC/HMX,RDX,TNT,DNT/ Please share sample!

Solids	P	D LIST METALS	8 RCRA		june 9	1 Contain
Solids	C	AG	Silver	Expires:05-DEC-93		
Solids	C	AS	Arsenic	Expires:05-DEC-93		
Solids	C	BA	Barium	Expires:05-DEC-93		
Solids	C	CD	Cadmium	Expires:05-DEC-93		
Solids	C	CR	Chromium	Expires:05-DEC-93		
Solids	C	HG	Mercury	Expires:05-DEC-93		
Solids	C	PB	Lead	Expires:05-DEC-93		
Solids	C	SE	Selenium	Expires:05-DEC-93		

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 09 1993, 09:06 am

Login Number: L14368
Account: KLE100 Kleinfelder
Site : DUGWAY 08/OD 30-2025-14.001

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
Solids	S DIG-MET	Total Metal Digestion	Expires:05-DEC-93				
Solids	S EXP-CYC	Cyclic Explosives	Expires:22-JUN-93				
Solids	S QC I	Level I QC Package					
L14368-5	DPG693S75		08-JUN-93	09-JUN-93	PA	18-JUN-93	
Contact:	Joel Carson/Level I QC/HMX,RDX,TNT,DNT/ Please share sample!						
Solids	P D LIST METALS	8 RCRA		june 9			1 Contain
Solids	C AG	Silver	Expires:05-DEC-93				
Solids	C AS	Arsenic	Expires:05-DEC-93				
Solids	C BA	Barium	Expires:05-DEC-93				
Solids	C CD	Cadmium	Expires:05-DEC-93				
Solids	C CR	Chromium	Expires:05-DEC-93				
Solids	C HG	Mercury	Expires:05-DEC-93				
Solids	C PB	Lead	Expires:05-DEC-93				
Solids	C SE	Selenium	Expires:05-DEC-93				
Solids	S DIG-MET	Total Metal Digestion	Expires:05-DEC-93				
Solids	S EXP-CYC	Cyclic Explosives	Expires:22-JUN-93				
Solids	S QC I	Level I QC Package					
L14368-6	DPG693S76		08-JUN-93	09-JUN-93	PA	18-JUN-93	
Contact:	Joel Carson/Level I QC/HMX,RDX,TNT,DNT/ Please share sample!						
Solids	P D LIST METALS	8 RCRA		june 9			1 Contain
Solids	C AG	Silver	Expires:05-DEC-93				
Solids	C AS	Arsenic	Expires:05-DEC-93				
Solids	C BA	Barium	Expires:05-DEC-93				
Solids	C CD	Cadmium	Expires:05-DEC-93				
Solids	C CR	Chromium	Expires:05-DEC-93				
Solids	C HG	Mercury	Expires:05-DEC-93				
Solids	C PB	Lead	Expires:05-DEC-93				
Solids	C SE	Selenium	Expires:05-DEC-93				
Solids	S DIG-MET	Total Metal Digestion	Expires:05-DEC-93				
Solids	S EXP-CYC	Cyclic Explosives	Expires:22-JUN-93				
Solids	S QC I	Level I QC Package					
L14368-7	DPG693S77		08-JUN-93	09-JUN-93	PA	18-JUN-93	
Contact:	Joel Carson/Level I QC/HMX,RDX,TNT,DNT/ Please share sample!						
Solids	P D LIST METALS	8 RCRA		june 9			1 Contain
Solids	C AG	Silver	Expires:05-DEC-93				
Solids	C AS	Arsenic	Expires:05-DEC-93				
Solids	C BA	Barium	Expires:05-DEC-93				
Solids	C CD	Cadmium	Expires:05-DEC-93				
Solids	C CR	Chromium	Expires:05-DEC-93				
Solids	C HG	Mercury	Expires:05-DEC-93				
Solids	C PB	Lead	Expires:05-DEC-93				
Solids	C SE	Selenium	Expires:05-DEC-93				
Solids	S DIG-MET	Total Metal Digestion	Expires:05-DEC-93				
Solids	S EXP-CYC	Cyclic Explosives	Expires:22-JUN-93				
Solids	S QC I	Level I QC Package					
L14368-8	DPG693S78		08-JUN-93	09-JUN-93	PA	18-JUN-93	
Contact:	Joel Carson/Level I QC/HMX,RDX,TNT,DNT						
Water	P D LIST METALS	8 RCRA		june 9			1 Contain
Water	C AG	Silver	Expires:05-DEC-93				
Water	C AS	Arsenic	Expires:05-DEC-93				
Water	C BA	Barium	Expires:05-DEC-93				
Water	C CD	Cadmium	Expires:05-DEC-93				
Water	C CR	Chromium	Expires:05-DEC-93				
Water	C HG	Mercury	Expires:05-DEC-93				
Water	C PB	Lead	Expires:05-DEC-93				
Water	C SE	Selenium	Expires:05-DEC-93				

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 09 1993, 09:06 am

Login Number: L14368
Account: KLE100 Kleinfelder
Site : DUGWAY 08/00 30-2025-14.001

Laboratory Sample Number			Client Sample Number	Method Description		Collect Date	Receive Date	PR	Due Date	
Water	S	DIG-MET		Total Metal Digestion	Expires:05-DEC-93					
Water	S	EXP-CYC		Cyclic Explosives	Expires:22-JUN-93		june 9			1 Contain
Water	S	QC I		Level I QC Package						
L14368-9			DPG693S79			08-JUN-93	09-JUN-93	PA	18-JUN-93	
Contact:	Joel Carson/Level I QC/HMX,RDX,TNT,DNT									
Water	P	D LIST METALS		8 RCRA			june 9			1 Contain
Water	C	AG		Silver	Expires:05-DEC-93					
Water	C	AS		Arsenic	Expires:05-DEC-93					
Water	C	BA		Barium	Expires:05-DEC-93					
Water	C	CD		Cadmium	Expires:05-DEC-93					
Water	C	CR		Chromium	Expires:05-DEC-93					
Water	C	HG		Mercury	Expires:05-DEC-93					
Water	C	PB		Lead	Expires:05-DEC-93					
Water	C	SE		Selenium	Expires:05-DEC-93					
Water	S	DIG-MET		Total Metal Digestion	Expires:05-DEC-93					
Water	S	EXP-CYC		Cyclic Explosives	Expires:22-JUN-93		june 9			1 Contain
Water	S	QC I		Level I QC Package						

Signature: ______________________

Date: ______________________

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date July 28, 1993

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-01
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S71

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

Released by: ____________________
Laboratory Supervisor

Report Date July 28, 1993

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-02
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S72

Contact: Joel Carson
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.0
Barium	6010	0.5	180.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	16.
Lead	6010	3.0	17.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.1

Released by: ____________________
Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-03
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S73

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.5
Barium	6010	0.5	170.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	15.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.2

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-04
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S74

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	7.3
Barium	6010	0.5	250.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	22.
Lead	6010	3.0	17.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.0

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Laboratory Supervisor

Report Date June 17, 1993

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463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
Fax (801) 263-8687

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-05
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S75

Contact: Joel Carson
Received By: Judi Smith

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.7
Barium	6010	0.5	330.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	11.
Lead	6010	3.0	10.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.5

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-06
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S76

Contact: Joel Carson
Received By: Judi Smith

Analytical Results

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Salt Lake City, Utah
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Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.9
Barium	6010	0.5	130.
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	16.
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.3

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Laboratory Supervisor

Report Date June 17, 1993

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-07
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S77

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**1.8**
Barium	6010	0.5	**24.**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**5.1**
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**0.9**

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Report Date June 17, 1993

INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-08
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S78

Contact: Joel Carson
Received By: Judi Smith

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date June 17, 1993

INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: June 9, 1993
Lab Sample ID Number: 14368-09
Field Sample ID: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S79

Contact: Joel Carson
Received By: Judi Smith

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date June 17, 1993

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Sample Number: 14368

Contact: Joel Carson
Received By: Judi Smith
Set Description: Three Water & Six Solid Samples

Quality Control Results

Units = (ppb)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14368-02	1,4-Dichlorobenzene	0.0	200.	33.5	39.4	17.7	19.7	10.5
14368-02	2,6-Dinitrotoluene	0.0	200.	83.1	95.3	41.5	47.6	13.7
14368-02	Pentachlorophenol	0.0	200.	49.1	54.3	24.5	27.1	10.1
14368-02	Phenol	0.0	200.	91.6	101.9	45.8	51.0	10.7
14368-02	Pyrene	0.0	200.	73.5	86.5	36.7	43.2	16.3
14367-01	Benzene	0.0	20.0	20.7	21.7	103.5	108.5	-4.7
14367-01	Chlorobenzene	0.0	20.0	20.1	22.9	100.5	114.5	-13.0
14367-01	1,2-Dichloroethane	0.0	20.0	21.4	22.5	107.0	112.5	-5.0
14367-01	Toluene	0.0	20.0	20.2	22.9	101.0	114.5	-12.5
14367-01	Trichloroethene	0.0	20.0	20.5	22.6	102.5	113.0	-9.7

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Laboratory Supervisor

Report Date 6/17/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Sample Number: 14368

Contact: Joel Carson
Received By: Judi Smith
Set Description: Three Water & Six Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14365-01	Arsenic	0.0	0.067	0.062	0.064	92.5	95.5	-3.2
13368-09	Barium	0.0	1.1	1.09	1.10	99.1	100.0	-0.9
13368-09	Cadmium	0.0	1.1	1.17	1.17	106.4	106.4	0.0
13368-09	Chromium	0.0	1.1	1.15	1.15	104.5	104.5	0.0
13368-09	Lead	0.0	1.1	1.16	1.17	105.5	106.4	-0.9
14359-01	Mercury	0.0	0.005	0.0045	0.0048	90.0	96.0	-6.5
14365-01	Selenium	0.0	0.067	0.057	0.055	85.1	82.1	3.6
13368-09	Silver	0.0	1.1	1.10	1.12	100.0	101.8	-1.8
14368-08	RDX	0.0	5.1	5.6	5.4	110.	106.	3.6

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

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Laboratory Supervisor

Report Date 6/17/93

ORGANIC ANALYSIS REPORT

AMERICAN
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ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank (Water)

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 15, 1993

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-01	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S71

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-08	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S78

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-09	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S79

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-02	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S72

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-03	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S73

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by:
Laboratory Supervisor

Report Date June 17, 1993

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-04	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S74

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-05	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S75

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-06	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S76

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 17, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 8, 1993
Date Received: June 9, 1993
Set Description: Six Solid & Three Water Samples

Set Identification #: 14368
Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 12, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-07	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S77

463 West 3600 South
Salt Lake City, Utah
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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Report Date June 17, 1993

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 9, 1993
Set Identification Number: 14368
Set Description: Three Water & Six Solid Samples

Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Semivolatile Organics	EPA SW-846 #8270	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank

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Analytical Results — ACID COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
Benzoic acid	100.	<100.
Benzyl alcohol	40.	<40.
2-Chlorophenol	40.	<40.
2,4-Dichlorophenol	40.	<40.
2,4-Dimethylphenol	40.	<40.
4,6-Dinitro-2-methylphenol	100.	<100.
2,4-Dinitrophenol	100.	<100.
2-Methylphenol	40.	<40.
4-Methylphenol	40.	<40.
2-Nitrophenol	100.	<100.
4-Nitrophenol	100.	<100.
4-Chloro-3-methylphenol	40.	<40.
Pentachlorophenol	100.	<100.
Phenol	40.	<40.
2,4,6-Trichlorophenol	40.	<40.
2,4,5-Trichlorophenol	40.	<40.

BASE/NEUTRAL COMPOUNDS

Compound	Detection Limit	Amount Detected
Acenaphthene	40.	<40.
Acenaphthylene	40.	<40.
Aniline	40.	<40.
Anthracene	40.	<40.
Benzenethiol	40.	<40.
Benzidine	200.	<200.
Benz(a)anthracene	40.	<40.
Benzo(a)pyrene	40.	<40.
3,4-Benzo(b)fluoranthene	40.	<40.
Benzo(g,h,i)perylene	100.	<100.

Report Date 6/15/93

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Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
Benzo(k)fluoranthene	40.	<40.
bis(2-Chloroethoxy)methane	40.	<40.
bis(2-Chloroethyl)ether	40.	<40.
bis(2-Chloroisopropyl)ether	40.	<40.
bis(2-Ethylhexyl)phthalate	40.	<40.
4-Bromophenyl phenyl ether	40.	<40.
4-Chloroaniline	40.	<40.
Butylbenzyl phthalate	40.	<40.
2-Chloronaphthalene	40.	<40.
4-Chlorophenyl phenyl ether	40.	<40.
Chrysene	40.	<40.
Dibenz(a,h)acridine	100.	<100.
Dibenz(a,h)anthracene	100.	<100.
Dibenzofuran	40.	<40.
1,2-Dichlorobenzene	40.	<40.
1,3-Dichlorobenzene	40.	<40.
1,4-Dichlorobenzene	40.	<40.
3,3'-Dichlorobenzidine	40.	<40.
Diethyl phthalate	40.	<40.
7,12-Dimethylbenz(a)anthracene	40.	<40.
Dimethyl phthalate	40.	<40.
Di-n-butyl phthalate	40.	<40.
2,4-Dinitrotoluene	40.	<40.
2,6-Dinitrotoluene	40.	<40.
Di-n-octyl phthalate	40.	<40.
1,2-Diphenylhydrazine	40.	<40.
Fluoranthene	40.	<40.
Fluorene	40.	<40.
Hexachlorobenzene	40.	<40.
Hexachlorobutadiene	40.	<40.
Hexachlorocyclopentadiene	40.	<40.
Hexachloroethane	40.	<40.
Indene	40.	<40.
Indeno(1,2,3-cd)pyrene	100.	<100.
Isophorone	40.	<40.

AMERICAN
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Lab Sample ID. Number:
14368-Method Blank

Field Sample ID. Number:
Method Blank

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
1-Methylnaphthalene	40.	<40.
2-Methylnaphthalene	40.	<40.
7-Methyl chrysene	40.	<40.
Naphthalene	40.	<40.
2-Nitroaniline	40.	<40.
3-Nitroaniline	40.	<40.
4-Nitroaniline	40.	<40.
Nitrobenzene	40.	<40.
N-Nitrosodimethylamine	40.	<40.
N-Nitrosodi-n-propylamine	40.	<40.
N-Nitrosodiphenylamine	40.	<40.
Phenanthrene	40.	<40.
Pyrene	40.	<40.
Quinoline	40.	<40.
1,2,4-Trichlorobenzene	40.	<40.

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.0	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/15/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Set Identification Number: 14368
Set Description: Three Water & Six Solid Samples

Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Semivolatile Organics	EPA SW-846 #8270	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-02	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S72

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Analytical Results

ACID COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzoic acid	150.	<150.
Benzyl alcohol	60.	<60.
2-Chlorophenol	60.	<60.
2,4-Dichlorophenol	60.	<60.
2,4-Dimethylphenol	60.	<60.
4,6-Dinitro-2-methylphenol	150.	<150.
2,4-Dinitrophenol	150.	<150.
2-Methylphenol	60.	<60.
4-Methylphenol	60.	<60.
2-Nitrophenol	150.	<150.
4-Nitrophenol	150.	<150.
4-Chloro-3-methylphenol	60.	<60.
Pentachlorophenol	150.	<150.
Phenol	60.	<60.
2,4,6-Trichlorophenol	60.	<60.
2,4,5-Trichlorophenol	60.	<60.

BASE/NEUTRAL COMPOUNDS

Compound:	Detection Limit:	Amount Detected:
Acenaphthene	60.	<60.
Acenaphthylene	60.	<60.
Aniline	60.	<60.
Anthracene	60.	<60.
Benzenethiol	60.	<60.
Benzidine	300.	<300.
Benz(a)anthracene	60.	<60.
Benzo(a)pyrene	60.	<60.
3,4-Benzo(b)fluoranthene	60.	<60.
Benzo(g,h,i)perylene	150.	<150.

Report Date 6/17/93

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Lab Sample ID. Number:
14368-02

Field Sample ID. Number:
Project #30-2025-160.01/Dugway OB/OD/DPG 693 S72

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzo(k)fluoranthene	60.	<60.
bis(2-Chloroethoxy)methane	60.	<60.
bis(2-Chloroethyl)ether	60.	<60.
bis(2-Chloroisopropyl)ether	60.	<60.
bis(2-Ethylhexyl)phthalate	60.	<60.
4-Bromophenyl phenyl ether	60.	<60.
4-Chloroaniline	60.	<60.
Butylbenzyl phthalate	60.	<60.
2-Chloronaphthalene	60.	<60.
4-Chlorophenyl phenyl ether	60.	<60.
Chrysene	60.	<60.
Dibenz(a,h)acridine	150.	<150.
Dibenz(a,h)anthracene	150.	<150.
Dibenzofuran	60.	<60.
1,2-Dichlorobenzene	60.	<60.
1,3-Dichlorobenzene	60.	<60.
1,4-Dichlorobenzene	60.	<60.
3,3'-Dichlorobenzidine	60.	<60.
Diethyl phthalate	60.	<60.
7,12-Dimethylbenz(a)anthracene	60.	<60.
Dimethyl phthalate	60.	<60.
Di-n-butyl phthalate	60.	<60.
2,4-Dinitrotoluene	60.	<60.
2,6-Dinitrotoluene	60.	<60.
Di-n-octyl phthalate	60.	<60.
1,2-Diphenylhydrazine	60.	<60.
Fluoranthene	60.	<60.
Fluorene	60.	<60.
Hexachlorobenzene	60.	<60.
Hexachlorobutadiene	60.	<60.
Hexachlorocyclopentadiene	60.	<60.
Hexachloroethane	60.	<60.
Indene	60.	<60.
Indeno(1,2,3-cd)pyrene	150.	<150.
Isophorone	60.	<60.

AMERICAN WEST ANALYTICAL LABORATORIES

Lab Sample ID. Number:
14368-02

Field Sample ID. Number:
Project #30-2025-160.01/Dugway OB/OD/DPG 693 S72

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1-Methylnaphthalene	60.	<60.
2-Methylnaphthalene	60.	<60.
7-Methyl chrysene	60.	<60.
Naphthalene	60.	<60.
2-Nitroaniline	60.	<60.
3-Nitroaniline	60.	<60.
4-Nitroaniline	60.	<60.
Nitrobenzene	60.	<60.
N-Nitrosodimethylamine	60.	<60.
N-Nitrosodi-n-propylamine	60.	<60.
N-Nitrosodiphenylamine	60.	<60.
Phenanthrene	60.	<60.
Pyrene	60.	<60.
Quinoline	60.	<60.
1,2,4-Trichlorobenzene	60.	<60.

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Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
Total Aliphatic Hydrocarbons	1,000.	**2,000.** A

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All compounds are reported in Dry Weight Basis.

A = Approximation based on relative response or a 1:1 response factor with the appropriate internal standard.

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Laboratory Supervisor

Report Date 6/17/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Set Identification Number: 14368
Set Description: Three Water & Six Solid Samples

Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Semivolatile Organics	EPA SW-846 #8270	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-03	Project #30-2025-160.01/Dugway OB/OD/DPG 693 S73

Analytical Results

ACID COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzoic acid	150.	<150.
Benzyl alcohol	60.	<60.
2-Chlorophenol	60.	<60.
2,4-Dichlorophenol	60.	<60.
2,4-Dimethylphenol	60.	<60.
4,6-Dinitro-2-methylphenol	150.	<150.
2,4-Dinitrophenol	150.	<150.
2-Methylphenol	60.	<60.
4-Methylphenol	60.	<60.
2-Nitrophenol	150.	<150.
4-Nitrophenol	150.	<150.
4-Chloro-3-methylphenol	60.	<60.
Pentachlorophenol	150.	<150.
Phenol	60.	<60.
2,4,6-Trichlorophenol	60.	<60.
2,4,5-Trichlorophenol	60.	<60.

BASE/NEUTRAL COMPOUNDS

Compound:	Detection Limit:	Amount Detected:
Acenaphthene	60.	<60.
Acenaphthylene	60.	<60.
Aniline	60.	<60.
Anthracene	60.	<60.
Benzenethiol	60.	<60.
Benzidine	300.	<300.
Benz(a)anthracene	60.	<60.
Benzo(a)pyrene	60.	<60.
3,4-Benzo(b)fluoranthene	60.	<60.
Benzo(g,h,i)perylene	150.	<150.

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Sampled: June 28, 1993
Date Received: June 30, 1993
Set Description: Five Water Samples

Set Identification #: 14637
Contact: Renee Zollinger
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	July 1, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14637-04	Project #30-2025-18.001/DPG 62893 S04

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Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 7/8/93

ORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Sampled: June 28, 1993
Date Received: June 30, 1993
Set Description: Five Water Samples

Set Identification #: 14637
Contact: Renee Zollinger
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	July 1, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14637-05	Project #30-2025-18.001/DPG 62893 S05

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Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 7/8/93

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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 28, 1993
Date Received: June 30, 1993
Set Description: Five Water Samples

Set Identification #: 14637
Contact: Renee Zollinger
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	July 1, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14637-02	Project #30-2025-18.001/DPG 62893 S02

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Analytical Results

Units = mg/L (ppm)

(801) 263-8686
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Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 7/8/93

ORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Sampled: June 28, 1993
Date Received: June 30, 1993
Set Description: Five Water Samples

Set Identification #: 14637
Contact: Renee Zollinger
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	July 1, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14637-03	Project #30-2025-18.001/DPG 62893 S03

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Analytical Results

Units = mg/L (ppm)

(801) 263-8686
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Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 7/8/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 24, 1993
Date Received: June 30, 1993
Set Description: Five Water Samples

Set Identification #: 14637
Contact: Renee Zollinger
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	July 1, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14637-Method Blank	Method Blank

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(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 7/7/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 24, 1993
Date Received: June 30, 1993
Set Description: Five Water Samples

Set Identification #: 14637
Contact: Renee Zollinger
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	July 1, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14637-01	Project #30-2025-18.001/DPG 62493 S01

463 West 3600 South
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Analytical Results

Units = mg/L (ppm)

(801) 263-8686
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Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 7/7/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 30, 1993
Lab Sample ID Number: 14637-05
Field Sample ID: Project #30-2025-18.001/DPG 62893 S05

Contact: Renee Zollinger
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.099**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	**0.01**
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date 7/8/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 30, 1993
Lab Sample ID Number: 14637-04
Field Sample ID: Project #30-2025-18.001/DPG 62893 S04

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.072**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	**0.01**
Lead	6010	0.05	**0.05**
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date 7/8/93

INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: June 30, 1993
Lab Sample ID Number: 14637-03
Field Sample ID: Project #30-2025-18.001/DPG 62893 S03

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.089**
Cadmium	6010	0.004	**0.004**
Chromium	6010	0.01	**0.02**
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Report Date 7/8/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 30, 1993
Lab Sample ID Number: 14637-02
Field Sample ID: Project #30-2025-18.001/DPG 62893 S02

Contact: Renee Zollinger
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.003**
Cadmium	6010	0.004	**0.005**
Chromium	6010	0.01	**0.01**
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date 7/8/93

INORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: June 30, 1993
Lab Sample ID Number: 14637-01
Field Sample ID: Project #30-2025-18.001/DPG 62493 S01

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.004
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Report Date 7/7/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 30, 1993
Lab Sample ID Number: 14637-Method Blank
Field Sample ID: Method Blank

Contact: Renee Zollinger
Received By: Elona Hayward

Analytical Results

463 West 3600 South
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TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 7/28/93

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 30 1993, 01:25 pm

Login Number: L14637
Account: KLE100 Kleinfelder
Site : 30-2025-18.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
		26						
L14637-5		DPG64293S05		28-JUN-93	30-JUN-93	PA	09-JUL-93	
Level 1 QC; Analyze for DNT, HMX, RDX, TNT only								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:25-DEC-93				
Water	C	AS	Arsenic	Expires:25-DEC-93				
Water	C	BA	Barium	Expires:25-DEC-93				
Water	C	CD	Cadmium	Expires:25-DEC-93				
Water	C	CR	Chromium	Expires:25-DEC-93				
Water	C	HG	Mercury	Expires:25-DEC-93				
Water	C	PB	Lead	Expires:25-DEC-93				
Water	C	SE	Selenium	Expires:25-DEC-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:25-DEC-93	june 30			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:12-JUL-93	june 30			1 Contain
Water	S	QC 1	Level 1 QC Package					

Signature: ______________________________

Date: ______________________________

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 30 1993, 01:25 pm

QC I II III

Login Number: L14637
Account: KLE100 Kleinfelder
Site : 30-2025-18.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
L14637-1		DPG64293S01		24-JUN-93	30-JUN-93	PA	09-JUL-93	
Level 1 QC; Analyze for DNT, HMX, RDX, TNT only								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:21-DEC-93				
Water	C	AS	Arsenic	Expires:21-DEC-93				
Water	C	BA	Barium	Expires:21-DEC-93				
Water	C	CD	Cadmium	Expires:21-DEC-93				
Water	C	CR	Chromium	Expires:21-DEC-93				
Water	C	HG	Mercury	Expires:21-DEC-93				
Water	C	PB	Lead	Expires:21-DEC-93				
Water	C	SE	Selenium	Expires:21-DEC-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:21-DEC-93	june 30			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:08-JUL-93	june 30			1 Contain
Water	S	QC I	Level I QC Package					
L14637-2		DPG64293S02		28-JUN-93	30-JUN-93	PA	09-JUL-93	
Level 1 QC; Analyze for DNT, HMX, RDX, TNT only								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:25-DEC-93				
Water	C	AS	Arsenic	Expires:25-DEC-93				
Water	C	BA	Barium	Expires:25-DEC-93				
Water	C	CD	Cadmium	Expires:25-DEC-93				
Water	C	CR	Chromium	Expires:25-DEC-93				
Water	C	HG	Mercury	Expires:25-DEC-93				
Water	C	PB	Lead	Expires:25-DEC-93				
Water	C	SE	Selenium	Expires:25-DEC-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:25-DEC-93	june 30			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:12-JUL-93	june 30			1 Contain
Water	S	QC I	Level I QC Package					
L14637-3		DPG64293S03		28-JUN-93	30-JUN-93	PA	09-JUL-93	
Level 1 QC; Analyze for DNT, HMX, RDX, TNT only								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:25-DEC-93				
Water	C	AS	Arsenic	Expires:25-DEC-93				
Water	C	BA	Barium	Expires:25-DEC-93				
Water	C	CD	Cadmium	Expires:25-DEC-93				
Water	C	CR	Chromium	Expires:25-DEC-93				
Water	C	HG	Mercury	Expires:25-DEC-93				
Water	C	PB	Lead	Expires:25-DEC-93				
Water	C	SE	Selenium	Expires:25-DEC-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:25-DEC-93	june 30			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:12-JUL-93	june 30			1 Contain
Water	S	QC I	Level I QC Package					
L14637-4		DPG64293S04		28-JUN-93	30-JUN-93	PA	09-JUL-93	
Level 1 QC; Analyze for DNT, HMX, RDX, TNT only								
Water	P	D LIST METALS	8 RCRA					
Water	C	AG	Silver	Expires:25-DEC-93				
Water	C	AS	Arsenic	Expires:25-DEC-93				
Water	C	BA	Barium	Expires:25-DEC-93				
Water	C	CD	Cadmium	Expires:25-DEC-93				
Water	C	CR	Chromium	Expires:25-DEC-93				
Water	C	HG	Mercury	Expires:25-DEC-93				
Water	C	PB	Lead	Expires:25-DEC-93				
Water	C	SE	Selenium	Expires:25-DEC-93				
Water	S	DIG-MET	Total Metal Digestion	Expires:25-DEC-93	june 30			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:12-JUL-93	june 30			1 Contain
Water	S	QC I	Level I QC Package					

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Sample Number: 14504

Contact: Joel Carson
Received By: Elona Hayward
Set Description: Three Water & Eight Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14491-01	Arsenic	0.001	0.067	0.070	0.070	103.0	103.0	0.0
14504-04	Barium	170.	55.	220.	220.	90.9	90.9	0.0
14504-04	Cadmium	0.9	55.	48.6	50.4	86.7	90.0	-3.6
14504-04	Chromium	12.	55.	60.9	62.7	88.9	92.2	-2.9
14504-04	Lead	9.8	55.	56.6	60.3	85.1	91.8	-6.3
14499-01	Mercury	0.0	0.002	0.00187	0.00197	93.5	98.5	-5.2
14548-03	Selenium	0.0	0.067	0.051	0.048	76.1	71.6	6.1
14504-04	Silver	3.1	55.	57.5	59.9	98.2	103.3	-4.8

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 6/29/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Sample Number: 14504

Contact: Joel Carson
Received By: Elona Hayward
Set Description: Three Water & Eight Solid Samples

Quality Control Results

Units = (ppb)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14530-01	Benzene	0.0	20.0	22.8	22.5	114.0	112.5	1.3
14530-01	Chlorobenzene	0.0	20.0	22.5	22.3	112.5	111.5	0.9
14530-01	t-1,2-Dichloroethene	0.0	20.0	22.4	22.2	112.0	111.0	0.9
14530-01 .	Toluene	0.0	20.0	20.1	22.6	100.5	113.0	-11.7
14530-01	Trichloroethene	0.0	20.0	23.2	22.7	116.0	113.5	2.2

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: [signature]
Laboratory Supervisor

Report Date 6/29/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Sample Number: 14504

Contact: Joel Carson
Received By: Elona Hayward
Set Description: Three Water & Eight Solid Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14504-02	RDX	0.0	10.0	7.1	7.8	71.	78.	-9.4
14504-02	1,4-Dichlorobenzene	0.0	200.	44.8	51.6	22.4	25.8	14.1
14504-02	2,4-Dinitrotoluene	0.0	200.	133.5	118.5	66.7	59.2	11.9
14504-02	Pentachlorophenol	0.0	200.	80.5	67.5	40.2	33.7	17.6
14504-02	Phenol	0.0	200.	112.5	107.1	56.2	53.5	4.9
14504-02	Pyrene	0.0	200.	126.2	108.8	63.1	54.4	14.8

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: [signature] Laboratory Supervisor

Report Date 6/29/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 10, 1993
Date Received: June 21, 1993
Set Description: Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-11	Project #30-2025-14.001/DPG693S80

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 19, 1993
Date Received: June 21, 1993
Set Description: Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-10	Project #30-2025-14.001/DPG693S91

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description: Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-08	Project #30-2025-14.001/DPG693S88

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description: Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-05	Project #30-2025-14.001/DPG693S85

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description: Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-04	Project #30-2025-14.001/DPG693S84

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description:- Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-03	Project #30-2025-14.001/DPG693S83

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
WEST
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description:- Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-02	Project #30-2025-14.001/DPG693S82

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description: - Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-Method Blank	Method Blank (Solid)

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description: Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-09	Project #30-2025-14.001/DPG693S90

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description:. Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-07	Project #30-2025-14.001/DPG693S87

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description:. Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-01	Project #30-2025-14.001/DPG693S81

Analytical Results

Units = mg/L (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: June 18, 1993
Date Received: June 21, 1993
Set Description:- Three Water & Eight Solid Samples

Set Identification #: 14504
Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 22, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-Method Blank	Method Blank (Water)

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number: 14504-06

Field Sample ID. Number: Project #30-2025-14.001/DPG693S86

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: ______________________
Laboratory Supervisor

Report Date 6/29/93

AMERICAN WEST ANALYTICAL LABORATORIES
463 West 3600 South
Salt Lake City, Utah
84115
(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number: 14504-06

Field Sample ID. Number: Project #30-2025-14.001/DPG693S86

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

ORGANIC ANALYSIS REPORT

AMERICAN
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Client: Kleinfelder
Date Received: June 21, 1993
Set Identification Number: 14504
Set Description: Three Water & Eight Solid Samples

Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	(SW-846 #8260) Purge & Trap GC/MS	June 24, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-06	Project #30-2025-14.001/DPG693S86

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

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(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:	Field Sample ID. Number:
14504-02	Project #30-2025-14.001/DPG693S82

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: ______________________
Laboratory Supervisor

Report Date 6/29/93

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Salt Lake City, Utah 84115
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Lab Sample ID. Number: 14504-02

Field Sample ID. Number: Project #30-2025-14.001/DPG693S82

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

Report Date 6/29/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Set Identification Number: 14504
Set Description: Three Water & Eight Solid Samples

Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	(SW-846 #8260) Purge & Trap GC/MS	June 24, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-02	Project #30-2025-14.001/DPG693S82

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

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Lab Sample ID. Number: 14504-Method Blank

Field Sample ID. Number: Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

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Laboratory Supervisor

Report Date 6/29/93

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Lab Sample ID. Number:
14504-Method Blank

Field Sample ID. Number:
Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

Report Date 6/29/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Set Identification Number: 14504
Set Description: Three Water & Eight Solid Samples

Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	(SW-846 #8260) Purge & Trap GC/MS	June 24, 1993

463 West 3600 South
Salt Lake City, Utah
84115

Lab Sample ID. Number:	Field Sample ID. Number:
14504-Method Blank	Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb)

(801) 263-8686
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Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

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(801) 263-8686
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Lab Sample ID. Number:
14504-06

Field Sample ID. Number:
Project #30-2025-14.001/DPG693S86

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1-Methylnaphthalene	40.	<40.
2-Methylnaphthalene	40.	<40.
7-Methyl chrysene	40.	<40.
Naphthalene	40.	<40.
2-Nitroaniline	40.	<40.
3-Nitroaniline	40.	<40.
4-Nitroaniline	40.	<40.
Nitrobenzene	40.	<40.
N-Nitrosodimethylamine	40.	<40.
N-Nitrosodi-n-propylamine	40.	<40.
N-Nitrosodiphenylamine	40.	<40.
Phenanthrene	40.	<40.
Pyrene	40.	<40.
Quinoline	40.	<40.
1,2,4-Trichlorobenzene	40.	<40.

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
2-(2-Ethoxyethoxy)-Ethanol	100.	**400.** A
C_{16} Unsaturated Nitrile	100.	**100.** A

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All compounds are reported in Dry Weight Basis.

A = Approximation based on relative response or a 1:1 response factor with the appropriate internal standard.

Released by: ______________
Laboratory Supervisor

Report Date 6/30/93

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Lab Sample ID. Number:
14504-06

Field Sample ID. Number:
Project #30-2025-14.001/DPG693S86

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzo(k)fluoranthene	40.	<40.
bis(2-Chloroethoxy)methane	40.	<40.
bis(2-Chloroethyl)ether	40.	<40.
bis(2-Chloroisopropyl)ether	40.	<40.
bis(2-Ethylhexyl)phthalate	40.	<40.
4-Bromophenyl phenyl ether	40.	<40.
4-Chloroaniline	40.	<40.
Butylbenzyl phthalate	40.	<40.
2-Chloronaphthalene	40.	<40.
4-Chlorophenyl phenyl ether	40.	<40.
Chrysene	40.	<40.
Dibenz(a,h)acridine	100.	<100.
Dibenz(a,h)anthracene	100.	<100.
Dibenzofuran	40.	<40.
1,2-Dichlorobenzene	40.	<40.
1,3-Dichlorobenzene	40.	<40.
1,4-Dichlorobenzene	40.	<40.
3,3'-Dichlorobenzidine	40.	<40.
Diethyl phthalate	40.	<40.
7,12-Dimethylbenz(a)anthracene	40.	<40.
Dimethyl phthalate	40.	<40.
Di-n-butyl phthalate	40.	<40.
2,4-Dinitrotoluene	40.	<40.
2,6-Dinitrotoluene	40.	<40.
Di-n-octyl phthalate	40.	<40.
1,2-Diphenylhydrazine	40.	<40.
Fluoranthene	40.	<40.
Fluorene	40.	<40.
Hexachlorobenzene	40.	<40.
Hexachlorobutadiene	40.	<40.
Hexachlorocyclopentadiene	40.	<40.
Hexachloroethane	40.	<40.
Indene	40.	<40.
Indeno(1,2,3-cd)pyrene	100.	<100.
Isophorone	40.	<40.

Report Date 6/30/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Set Identification Number: 14504
Set Description: Three Water & Eight Solid Samples

Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Semivolatile Organics	EPA SW-846 #8270	June 25, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-06	Project #30-2025-14.001/DPG693S86

463 West 3600 South
Salt Lake City, Utah
84115

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Analytical Results — ACID COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzoic acid	100.	<100.
Benzyl alcohol	40.	<40.
2-Chlorophenol	40.	<40.
2,4-Dichlorophenol	40.	<40.
2,4-Dimethylphenol	40.	<40.
4,6-Dinitro-2-methylphenol	100.	<100.
2,4-Dinitrophenol	100.	<100.
2-Methylphenol	40.	<40.
4-Methylphenol	40.	<40.
2-Nitrophenol	100.	<100.
4-Nitrophenol	100.	<100.
4-Chloro-3-methylphenol	40.	<40.
Pentachlorophenol	100.	<100.
Phenol	40.	<40.
2,4,6-Trichlorophenol	40.	<40.
2,4,5-Trichlorophenol	40.	<40.

BASE/NEUTRAL COMPOUNDS

Compound	Detection Limit	Amount Detected
Acenaphthene	40.	<40.
Acenaphthylene	40.	<40.
Aniline	40.	<40.
Anthracene	40.	<40.
Benzenethiol	40.	<40.
Benzidine	200.	<200.
Benz(a)anthracene	40.	<40.
Benzo(a)pyrene	40.	<40.
3,4-Benzo(b)fluoranthene	40.	<40.
Benzo(g,h,i)perylene	100.	<100.

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Lab Sample ID. Number: 14504-02

Field Sample ID. Number: Project #30-2025-14.001/DPG693S82

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1-Methylnaphthalene	40.	<40.
2-Methylnaphthalene	40.	<40.
7-Methyl chrysene	40.	<40.
Naphthalene	40.	<40.
2-Nitroaniline	40.	<40.
3-Nitroaniline	40.	<40.
4-Nitroaniline	40.	<40.
Nitrobenzene	40.	<40.
N-Nitrosodimethylamine	40.	<40.
N-Nitrosodi-n-propylamine	40.	<40.
N-Nitrosodiphenylamine	40.	<40.
Phenanthrene	40.	<40.
Pyrene	40.	<40.
Quinoline	40.	<40.
1,2,4-Trichlorobenzene	40.	<40.

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(801) 263-8686
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Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
C_{19} to C_{20} Aliphatic Hydrocarbon	100.	**400.** A
2-(2-Ethoxyethoxy)-Ethanol	100.	**300.** A
C_{29} Fatty Acid	100.	**400.** A

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All compounds are reported in Dry Weight Basis.

A = Approximation based on relative response or a 1:1 response factor with the appropriate internal standard.

Released by: ____________________
Laboratory Supervisor

Report Date 6/30/93

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Lab Sample ID. Number: 14504-02

Field Sample ID. Number: Project #30-2025-14.001/DPG693S82

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzo(k)fluoranthene	40.	<40.
bis(2-Chloroethoxy)methane	40.	<40.
bis(2-Chloroethyl)ether	40.	<40.
bis(2-Chloroisopropyl)ether	40.	<40.
bis(2-Ethylhexyl)phthalate	40.	<40.
4-Bromophenyl phenyl ether	40.	<40.
4-Chloroaniline	40.	<40.
Butylbenzyl phthalate	40.	<40.
2-Chloronaphthalene	40.	<40.
4-Chlorophenyl phenyl ether	40.	<40.
Chrysene	40.	<40.
Dibenz(a,h)acridine	100.	<100.
Dibenz(a,h)anthracene	100.	<100.
Dibenzofuran	40.	<40.
1,2-Dichlorobenzene	40.	<40.
1,3-Dichlorobenzene	40.	<40.
1,4-Dichlorobenzene	40.	<40.
3,3'-Dichlorobenzidine	40.	<40.
Diethyl phthalate	40.	<40.
7,12-Dimethylbenz(a)anthracene	40.	<40.
Dimethyl phthalate	40.	<40.
Di-n-butyl phthalate	40.	<40.
2,4-Dinitrotoluene	40.	<40.
2,6-Dinitrotoluene	40.	<40.
Di-n-octyl phthalate	40.	<40.
1,2-Diphenylhydrazine	40.	<40.
Fluoranthene	40.	<40.
Fluorene	40.	<40.
Hexachlorobenzene	40.	<40.
Hexachlorobutadiene	40.	<40.
Hexachlorocyclopentadiene	40.	<40.
Hexachloroethane	40.	<40.
Indene	40.	<40.
Indeno(1,2,3-cd)pyrene	100.	<100.
Isophorone	40.	<40.

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AMERICAN
WEST
ANALYTICAL
LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Set Identification Number: 14504
Set Description: Three Water & Eight Solid Samples

Contact: Joel Carson
Received By: Elona Hayward

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Semivolatile Organics	EPA SW-846 #8270	June 25, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-02	Project #30-2025-14.001/DPG693S82

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Analytical Results

ACID COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzoic acid	100.	<100.
Benzyl alcohol	40.	<40.
2-Chlorophenol	40.	<40.
2,4-Dichlorophenol	40.	<40.
2,4-Dimethylphenol	40.	<40.
4,6-Dinitro-2-methylphenol	100.	<100.
2,4-Dinitrophenol	100.	<100.
2-Methylphenol	40.	<40.
4-Methylphenol	40.	<40.
2-Nitrophenol	100.	<100.
4-Nitrophenol	100.	<100.
4-Chloro-3-methylphenol	40.	<40.
Pentachlorophenol	100.	<100.
Phenol	40.	<40.
2,4,6-Trichlorophenol	40.	<40.
2,4,5-Trichlorophenol	40.	<40.

BASE/NEUTRAL COMPOUNDS

Compound:	Detection Limit:	Amount Detected:
Acenaphthene	40.	<40.
Acenaphthylene	40.	<40.
Aniline	40.	<40.
Anthracene	40.	<40.
Benzenethiol	40.	<40.
Benzidine	200.	<200.
Benz(a)anthracene	40.	<40.
Benzo(a)pyrene	40.	<40.
3,4-Benzo(b)fluoranthene	40.	<40.
Benzo(g,h,i)perylene	100.	<100.

Report Date 6/30/93

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Lab Sample ID. Number:	Field Sample ID. Number:
14504-Method Blank	Method Blank

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
1-Methylnaphthalene	40.	<40.
2-Methylnaphthalene	40.	<40.
7-Methyl chrysene	40.	<40.
Naphthalene	40.	<40.
2-Nitroaniline	40.	<40.
3-Nitroaniline	40.	<40.
4-Nitroaniline	40.	<40.
Nitrobenzene	40.	<40.
N-Nitrosodimethylamine	40.	<40.
N-Nitrosodi-n-propylamine	40.	<40.
N-Nitrosodiphenylamine	40.	<40.
Phenanthrene	40.	<40.
Pyrene	40.	<40.
Quinoline	40.	<40.
1,2,4-Trichlorobenzene	40.	<40.

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	100.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/29/93

AMERICAN
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Lab Sample ID. Number: 14504-Method Blank

Field Sample ID. Number: Method Blank

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
Benzo(k)fluoranthene	40.	<40.
bis(2-Chloroethoxy)methane	40.	<40.
bis(2-Chloroethyl)ether	40.	<40.
bis(2-Chloroisopropyl)ether	40.	<40.
bis(2-Ethylhexyl)phthalate	40.	<40.
4-Bromophenyl phenyl ether	40.	<40.
4-Chloroaniline	40.	<40.
Butylbenzyl phthalate	40.	<40.
2-Chloronaphthalene	40.	<40.
4-Chlorophenyl phenyl ether	40.	<40.
Chrysene	40.	<40.
Dibenz(a,h)acridine	100.	<100.
Dibenz(a,h)anthracene	100.	<100.
Dibenzofuran	40.	<40.
1,2-Dichlorobenzene	40.	<40.
1,3-Dichlorobenzene	40.	<40.
1,4-Dichlorobenzene	40.	<40.
3,3'-Dichlorobenzidine	40.	<40.
Diethyl phthalate	40.	<40.
7,12-Dimethylbenz(a)anthracene	40.	<40.
Dimethyl phthalate	40.	<40.
Di-n-butyl phthalate	40.	<40.
2,4-Dinitrotoluene	40.	<40.
2,6-Dinitrotoluene	40.	<40.
Di-n-octyl phthalate	40.	<40.
1,2-Diphenylhydrazine	40.	<40.
Fluoranthene	40.	<40.
Fluorene	40.	<40.
Hexachlorobenzene	40.	<40.
Hexachlorobutadiene	40.	<40.
Hexachlorocyclopentadiene	40.	<40.
Hexachloroethane	40.	<40.
Indene	40.	<40.
Indeno(1,2,3-cd)pyrene	100.	<100.
Isophorone	40.	<40.

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ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

Client: Kleinfelder | Contact: Joel Carson
Date Received: June 21, 1993 | Received By: Elona Hayward
Set Identification Number: 14504
Set Description: Three Water & Eight Solid Samples

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Semivolatile Organics	EPA SW-846 #8270	June 25, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14504-Method Blank	Method Blank

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Analytical Results — ACID COMPOUNDS

Units = µg/kg (ppb)

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Compound:	Detection Limit:	Amount Detected:
Benzoic acid	100.	<100.
Benzyl alcohol	40.	<40.
2-Chlorophenol	40.	<40.
2,4-Dichlorophenol	40.	<40.
2,4-Dimethylphenol	40.	<40.
4,6-Dinitro-2-methylphenol	100.	<100.
2,4-Dinitrophenol	100.	<100.
2-Methylphenol	40.	<40.
4-Methylphenol	40.	<40.
2-Nitrophenol	100.	<100.
4-Nitrophenol	100.	<100.
4-Chloro-3-methylphenol	40.	<40.
Pentachlorophenol	100.	<100.
Phenol	40.	<40.
2,4,6-Trichlorophenol	40.	<40.
2,4,5-Trichlorophenol	40.	<40.

BASE/NEUTRAL COMPOUNDS

Compound	Detection Limit	Amount Detected
Acenaphthene	40.	<40.
Acenaphthylene	40.	<40.
Aniline	40.	<40.
Anthracene	40.	<40.
Benzenethiol	40.	<40.
Benzidine	200.	<200.
Benz(a)anthracene	40.	<40.
Benzo(a)pyrene	40.	<40.
3,4-Benzo(b)fluoranthene	40.	<40.
Benzo(g,h,i)perylene	100.	<100.

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-11
Field Sample ID: Project #30-2025-14.001/DPG693S80

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.7
Barium	6010	0.5	180.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	5.7
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.0

Released by: ____________________
Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-10
Field Sample ID: Project #30-2025-14.001/DPG693S91

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	7.0
Barium	6010	0.5	95.
Cadmium	6010	0.2	0.8
Chromium	6010	0.5	13.
Lead	6010	3.0	10.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.0

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-09
Field Sample ID: Project #30-2025-14.001/DPG693S90

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.003
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-08
Field Sample ID: Project #30-2025-14.001/DPG693S88

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	1.4
Barium	6010	0.5	30.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	5.8
Lead	6010	3.0	<3.0
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.4

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-07
Field Sample ID: Project #30-2025-14.001/DPG693S87

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.003
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-05
Field Sample ID: Project #30-2025-14.001/DPG693S85

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	5.7
Barium	6010	0.5	120.
Cadmium	6010	0.2	0.8
Chromium	6010	0.5	17.
Lead	6010	3.0	13.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.0

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-04
Field Sample ID: Project #30-2025-14.001/DPG693S84

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	3.7
Barium	6010	0.5	170.
Cadmium	6010	0.2	0.9
Chromium	6010	0.5	12.
Lead	6010	3.0	9.8
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	3.1

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-03
Field Sample ID: Project #30-2025-14.001/DPG693S83

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	6.1
Barium	6010	0.5	200.
Cadmium	6010	0.2	1.2
Chromium	6010	0.5	18.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.4

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-02
Field Sample ID: Project #30-2025-14.001/DPG693S82

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	4.4
Barium	6010	0.5	170.
Cadmium	6010	0.2	1.6
Chromium	6010	0.5	15.
Lead	6010	3.0	14.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.5

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Laboratory Supervisor

Report Date June 30, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Joel Carson
Received By: Elona Hayward

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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date July 28, 1993

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-01
Field Sample ID: Project #30-2025-14.001/DPG693S81

Contact: Joel Carson
Received By: Elona Hayward

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Salt Lake City, Utah
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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	**0.008**
Barium	6010	0.002	**0.010**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date June 30, 1993

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 21, 1993
Lab Sample ID Number: 14504-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Joel Carson
Received By: Elona Hayward

Analytical Results

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TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ____________________
Laboratory Supervisor

Report Date July 28, 1993

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 21 1993, 11:40 am

Login Number: L14504
Account: KLE100 Kleinfelder
Site : DUGWAY

Laboratory Sample Number			Client Sample Number	Method Description	Collect Date	Receive Date	Due PR Date	
Water	C	CR		Chromium	Expires:15-DEC-93			
Water	C	HG		Mercury	Expires:15-DEC-93			
Water	C	PB		Lead	Expires:15-DEC-93			
Water	C	SE		Selenium	Expires:15-DEC-93			
Water	S	DIG-MET		Total Metal Digestion	Expires:15-DEC-93			
Water	S	EXP-CYC		Cyclic Explosives	Expires:02-JUL-93	june 21		1 Contain
Water	S	QC I		Level I QC Package				
L14504-10			DPG693591		19-JUN-93	21-JUN-93	PA 30-JUN-93	
Share sample, metals & explosives. Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson								
Solids	P	D LIST METALS		8 RCRA		june 21		1 Contain
Solids	C	AG		Silver	Expires:16-DEC-93			
Solids	C	AS		Arsenic	Expires:16-DEC-93			
Solids	C	BA		Barium	Expires:16-DEC-93			
Solids	C	CD		Cadmium	Expires:16-DEC-93			
Solids	C	CR		Chromium	Expires:16-DEC-93			
Solids	C	HG		Mercury	Expires:16-DEC-93			
Solids	C	PB		Lead	Expires:16-DEC-93			
Solids	C	SE		Selenium	Expires:16-DEC-93			
Solids	S	DIG-MET		Total Metal Digestion	Expires:16-DEC-93			
Solids	S	EXP-CYC		Cyclic Explosives	Expires:03-JUL-93			
Solids	S	QC I	5	Level I QC Package				
L14504-11			DPG693580		10-JUN-93	21-JUN-93	PA 30-JUN-93	
Note sampling date for this sample only. Share sample, metals & explosives. Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson								
Solids	P	D LIST METALS		8 RCRA		june 21		1 Contain
Solids	C	AG		Silver	Expires:07-DEC-93			
Solids	C	AS		Arsenic	Expires:07-DEC-93			
Solids	C	BA		Barium	Expires:07-DEC-93			
Solids	C	CD		Cadmium	Expires:07-DEC-93			
Solids	C	CR		Chromium	Expires:07-DEC-93			
Solids	C	HG		Mercury	Expires:07-DEC-93			
Solids	C	PB		Lead	Expires:07-DEC-93			
Solids	C	SE		Selenium	Expires:07-DEC-93			
Solids	S	DIG-MET		Total Metal Digestion	Expires:07-DEC-93			
Solids	S	EXP-CYC		Cyclic Explosives	Expires:24-JUN-93			
Solids	S	QC I		Level I QC Package				

Signature: ____________________

Date: ____________________

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 21 1993, 11:40 am

Login Number: L14504
Account: KLE100 Kleinfelder
Site : DUGWAY

Laboratory Sample Number			Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
Solids	S	QC I		Level I QC Package					
L14504-5			DPG693585		18-JUN-93	21-JUN-93	PA	30-JUN-93	
Share sample, metals & exposives. Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson									
Solids	P	D LIST METALS		8 RCRA		june 21			1 Contain
Solids	C	AG		Silver	Expires:15-DEC-93				
Solids	C	AS		Arsenic	Expires:15-DEC-93				
Solids	C	BA		Barium	Expires:15-DEC-93				
Solids	C	CD		Cadmium	Expires:15-DEC-93				
Solids	C	CR		Chromium	Expires:15-DEC-93				
Solids	C	HG		Mercury	Expires:15-DEC-93				
Solids	C	PB		Lead	Expires:15-DEC-93				
Solids	C	SE		Selenium	Expires:15-DEC-93				
Solids	S	DIG-MET		Total Metal Digestion	Expires:15-DEC-93				
Solids	S	EXP-CYC		Cyclic Explosives	Expires:02-JUL-93				
Solids	S	QC I		Level I QC Package					
L14504-6			DPG693586		18-JUN-93	21-JUN-93	PA	30-JUN-93	
Share sample, Jerry & Semi's. Level I QC. Contact: Joel Carson									
Solids	S	QC I		Level I QC Package					
Solids	S	SEMI		Semivolatile Analysis	Expires:25-JUN-93				
Solids	S	VOC		Volatile Analysis	Expires:02-JUL-93	jerry			1 Contain
L14504-7			DPG693587		18-JUN-93	21-JUN-93	PA	30-JUN-93	
Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson									
Water	P	D LIST METALS		8 RCRA		june 21			1 Contain
Water	C	AG		Silver	Expires:15-DEC-93				
er	C	AS		Arsenic	Expires:15-DEC-93				
r	C	BA		Barium	Expires:15-DEC-93				
ter	C	CD		Cadmium	Expires:15-DEC-93				
ater	C	CR		Chromium	Expires:15-DEC-93				
Water	C	HG		Mercury	Expires:15-DEC-93				
Water	C	PB		Lead	Expires:15-DEC-93				
Water	C	SE		Selenium	Expires:15-DEC-93				
Water	S	DIG-MET		Total Metal Digestion	Expires:15-DEC-93				
Water	S	EXP-CYC		Cyclic Explosives	Expires:02-JUL-93	june 21			1 Contain
Water	S	QC I		Level I QC Package					
L14504-8			DPG693588		18-JUN-93	21-JUN-93	PA	30-JUN-93	
Share sample, Metals & explosives. Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson									
Solids	P	D LIST METALS		8 RCRA		june 21			1 Contain
Solids	C	AG		Silver	Expires:15-DEC-93				
Solids	C	AS		Arsenic	Expires:15-DEC-93				
Solids	C	BA		Barium	Expires:15-DEC-93				
Solids	C	CD		Cadmium	Expires:15-DEC-93				
Solids	C	CR		Chromium	Expires:15-DEC-93				
Solids	C	HG		Mercury	Expires:15-DEC-93				
Solids	C	PB		Lead	Expires:15-DEC-93				
Solids	C	SE		Selenium	Expires:15-DEC-93				
Solids	S	DIG-MET		Total Metal Digestion	Expires:15-DEC-93				
Solids	S	EXP-CYC		Cyclic Explosives	Expires:02-JUL-93				
Solids	S	QC I		Level I QC Package					
L14504-9			DPG693590		18-JUN-93	21-JUN-93	PA	30-JUN-93	
Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson									
Water	P	D LIST METALS		8 RCRA		june 21			1 Contain
Water	C	AG		Silver	Expires:15-DEC-93				
Water	C	AS		Arsenic	Expires:15-DEC-93				
Water	C	BA		Barium	Expires:15-DEC-93				
Water	C	CD		Cadmium	Expires:15-DEC-93				

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 21 1993, 11:40 am

Login Number: L14504
Account: KLE100 Kleinfelder
Site : DUGWAY

1

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14504-1	DPG693581		18-JUN-93	21-JUN-93	PA	30-JUN-93

Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson

Water	P	D LIST METALS	8 RCRA		june 21	1 Contain
Water	C	AG	Silver	Expires:15-DEC-93		
Water	C	AS	Arsenic	Expires:15-DEC-93		
Water	C	BA	Barium	Expires:15-DEC-93		
Water	C	CD	Cadmium	Expires:15-DEC-93		
Water	C	CR	Chromium	Expires:15-DEC-93		
Water	C	HG	Mercury	Expires:15-DEC-93		
Water	C	PB	Lead	Expires:15-DEC-93		
Water	C	SE	Selenium	Expires:15-DEC-93		
Water	S	DIG-MET	Total Metal Digestion	Expires:15-DEC-93		
Water	S	EXP-CYC	Cyclic Explosives	Expires:02-JUL-93	june 21	1 Contain
Water	S	QC I	Level I QC Package			

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14504-2	DPG693582		18-JUN-93	21-JUN-93	PA	30-JUN-93

Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA			
Solids	C	AG	Silver	Expires:15-DEC-93		
Solids	C	AS	Arsenic	Expires:15-DEC-93		
Solids	C	BA	Barium	Expires:15-DEC-93		
Solids	C	CD	Cadmium	Expires:15-DEC-93		
Solids	C	CR	Chromium	Expires:15-DEC-93		
Solids	C	HG	Mercury	Expires:15-DEC-93		
Solids	C	PB	Lead	Expires:15-DEC-93		
Solids	C	SE	Selenium	Expires:15-DEC-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:15-DEC-93	june 21	1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:02-JUL-93	june 21	1 Contain
Solids	S	QC I	Level I QC Package			
Solids	S	SEMI	Semivolatile Analysis	Expires:25-JUN-93	hall	1 Contain
Solids	S	VOC	Volatile Analysis	Expires:02-JUL-93	jerry	1 Contain

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14504-3	DPG693583		18-JUN-93	21-JUN-93	PA	30-JUN-93

Share sample, metals & explosives. Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA		june 21	1 Contain
Solids	C	AG	Silver	Expires:15-DEC-93		
Solids	C	AS	Arsenic	Expires:15-DEC-93		
Solids	C	BA	Barium	Expires:15-DEC-93		
Solids	C	CD	Cadmium	Expires:15-DEC-93		
Solids	C	CR	Chromium	Expires:15-DEC-93		
Solids	C	HG	Mercury	Expires:15-DEC-93		
Solids	C	PB	Lead	Expires:15-DEC-93		
Solids	C	SE	Selenium	Expires:15-DEC-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:15-DEC-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:02-JUL-93		
Solids	S	QC I	Level I QC Package			

Laboratory Sample Number	Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date
L14504-4	DPG693584		18-JUN-93	21-JUN-93	PA	30-JUN-93

Share sample, metals & explosives. Level I QC. Explosives: DNT,HMX, RDX, TNT. Contact: Joel Carson

Solids	P	D LIST METALS	8 RCRA		june 21	1 Contain
Solids	C	AG	Silver	Expires:15-DEC-93		
Solids	C	AS	Arsenic	Expires:15-DEC-93		
Solids	C	BA	Barium	Expires:15-DEC-93		
Solids	C	CD	Cadmium	Expires:15-DEC-93		
Solids	C	CR	Chromium	Expires:15-DEC-93		
Solids	C	HG	Mercury	Expires:15-DEC-93		
Solids	C	PB	Lead	Expires:15-DEC-93		
Solids	C	SE	Selenium	Expires:15-DEC-93		
Solids	S	DIG-MET	Total Metal Digestion	Expires:15-DEC-93		
Solids	S	EXP-CYC	Cyclic Explosives	Expires:02-JUL-93		

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 10, 1993
Sample Number: 14394

Contact: Joel Carson
Received By: Jennifer Habel
Set Description: Five Solid & Two Water Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14356-01	Arsenic	0.006	0.067	0.064	0.065	86.6	88.1	-1.6
14368-06	Barium	130.	55.	182.	186.	94.5	101.8	-2.2
14368-06	Cadmium	23.	55.	49.0	50.3	88.6	91.0	-2.6
14368-06	Chromium	0.27	55.	65.3	66.3	89.6	91.5	-1.5
14368-06	Lead	11.	55.	60.0	59.7	89.1	88.5	0.5
14394-06	Mercury	0.007	0.05	0.053	0.057	92.0	100.0	-7.3
14356-01	Selenium	0.0	0.067	0.074	0.070	110.4	104.5	5.6
14368-06	Silver	2.3	55.	54.9	55.2	95.6	96.2	-0.5
14359-06	RDX	0.0	10.2	9.33	9.30	91.5	91.2	0.3

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ____________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:
14394-07

Field Sample ID. Number:
Project #30-2025-15.001/DPG 593-08

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-06	Project #30-2025-15.001/DPG 593-07

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-Method Blank	Method Blank (Water)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/L (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.01	<0.01
HMX	0.02	<0.02
RDX	0.02	<0.02
TNT	0.01	<0.01

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-05	Project #30-2025-15.001/DPG 593 S26

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:
Cyclic Explosives

Method Ref. Number:
EPA SW-846 #8330

Date Analyzed:
June 11, 1993

Lab Sample ID. Number:
14394-04

Field Sample ID. Number:
Project #30-2025-15.001/DPG 593 S25

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

(801) 263-8686
Fax (801) 263-8687

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/16/93

ORGANIC ANALYSIS REPORT

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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-03	Project #30-2025-15.001/DPG 593 S24

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: Joel Carpenter
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-02	Project #30-2025-15.001/DPG 593 S23

463 West 3600 South
Salt Lake City, Utah
84115

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

(801) 263-8686
Fax (801) 263-8687

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ______________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
WEST
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LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-01	Project #30-2025-15.001/DPG 593 S22

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

ORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Sampled: May 6, 1993
Date Received: June 10, 1993
Set Description: Five Solid & Two Water Samples

Set Identification #: 14394
Contact: Joel Carson
Received By: Jennifer Habel

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Cyclic Explosives	EPA SW-846 #8330	June 11, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14394-Method Blank	Method Blank (Solid)

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

Units = mg/kg (ppm)

Compound:	Detection Limit:	Amount Detected:
DNT	0.25	<0.25
HMX	2.2	<2.2
RDX	1.0	<1.0
TNT	0.25	<0.25

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: ____________________
Laboratory Supervisor

Report Date 6/16/93

INORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-07
Field Sample ID: Project #30-2025-15.001/DPG 593-08

Contact: Joel Carson
Received By: Jennifer Habel

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	0.003
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by:
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-06
Field Sample ID: Project #30-2025-15.001/DPG 593-07

Contact: Joel Carson
Received By: Jennifer Habel

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Arsenic	7060	0.005	<0.005
Barium	6010	0.002	**0.005**
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Mercury	7471	0.001	<0.001
Selenium	7740	0.005	<0.005
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-Method Blank
Field Sample ID: Method Blank (Water)

Contact: Joel Carson
Received By: Jennifer Habel

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/L	Amount Detected: mg/L
Barium	6010	0.002	<0.002
Cadmium	6010	0.004	<0.004
Chromium	6010	0.01	<0.01
Lead	6010	0.05	<0.05
Silver	6010	0.01	<0.01

Released by: ______________________
Laboratory Supervisor

Report Date 7/28/93

AMERICAN
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INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-05
Field Sample ID: Project #30-2025-15.001/DPG 593 S26

Contact: Joel Carson
Received By: Jennifer Habel

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	6.4
Barium	6010	0.5	290.
Cadmium	6010	0.2	0.3
Chromium	6010	0.5	14.
Lead	6010	3.0	11.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.6

Released by: ____________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-04
Field Sample ID: Project #30-2025-15.001/DPG 593 S25

Contact: Joel Carson
Received By: Jennifer Habel

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	6.0
Barium	6010	0.5	190.
Cadmium	6010	0.2	0.2
Chromium	6010	0.5	16.
Lead	6010	3.0	12.
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	2.2

Released by: ____________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
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ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Contact: Joel Carson
Date Received: June 10, 1993
Received By: Jennifer Habel
Lab Sample ID Number: 14394-03
Field Sample ID: Project #30-2025-15.001/DPG 593 S24

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**4.6**
Barium	6010	0.5	**160.**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**14.**
Lead	6010	3.0	**7.6**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.6**

Released by: ____________________
Laboratory Supervisor

Report Date 6/16/93

INORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-02
Field Sample ID: Project #30-2025-15.001/DPG 593 S23

Contact: Joel Carson
Received By: Jennifer Habel

Analytical Results

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	**8.9**
Barium	6010	0.5	**220.**
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	**16.**
Lead	6010	3.0	**11.**
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	**1.7**

Released by: ____________
Laboratory Supervisor

Report Date 6/16/93

INORGANIC ANALYSIS REPORT

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ANALYTICAL
LABORATORIES

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-01
Field Sample ID: Project #30-2025-15.001/DPG 593 S22

Contact: Joel Carson
Received By: Jennifer Habel

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Arsenic	7060	0.5	7.6
Barium	6010	0.5	230.
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	16.
Lead	6010	3.0	8.9
Mercury	7471	0.1	<0.1
Selenium	7740	0.1	<0.1
Silver	6010	0.5	1.8

Released by: ______________________
Laboratory Supervisor

Report Date 6/16/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

INORGANIC ANALYSIS REPORT

Client: Kleinfelder
Date Received: June 10, 1993
Lab Sample ID Number: 14394-Method Blank
Field Sample ID: Method Blank (Solid)

Contact: Joel Carson
Received By: Jennifer Habel

463 West 3600 South
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Analytical Results

TOTAL METALS	Method Used:	Detection Limit: mg/kg	Amount Detected: mg/kg
Barium	6010	0.5	<0.5
Cadmium	6010	0.2	<0.2
Chromium	6010	0.5	<0.5
Lead	6010	3.0	<3.0
Silver	6010	0.5	<0.5

Released by: ______________________
Laboratory Supervisor

Report Date 7/28/93

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 10 1993, 02:30 pm

Login Number: L14394
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number		Client Sample Number	Method Description	Collect Date	Receive Date	PR	Due Date	
L14394-1		DPG 593 S22	-	06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Share w/metals; Level 1 QC; Contact: Joel Carson								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:03-DEC-93				
Solids	C	AS	Arsenic	Expires:03-DEC-93				
Solids	C	BA	Barium	Expires:03-DEC-93				
Solids	C	CD	Cadmium	Expires:03-DEC-93				
Solids	C	CR	Chromium	Expires:03-DEC-93				
Solids	C	HG	Mercury	Expires:03-DEC-93				
Solids	C	PB	Lead	Expires:03-DEC-93				
Solids	C	SE	Selenium	Expires:03-DEC-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93				
Solids	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93	june 10			1 Contain
Solids	S	QC I	Level I QC Package					
L14394-2		DPG 593 S23		06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Share w/metals; Level 1 QC								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:03-DEC-93				
Solids	C	AS	Arsenic	Expires:03-DEC-93				
Solids	C	BA	Barium	Expires:03-DEC-93				
Solids	C	CD	Cadmium	Expires:03-DEC-93				
Solids	C	CR	Chromium	Expires:03-DEC-93				
Solids	C	HG	Mercury	Expires:03-DEC-93				
Solids	C	PB	Lead	Expires:03-DEC-93				
..lids	C	SE	Selenium	Expires:03-DEC-93				
ds	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93				
ids	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93	june 10			1 Contain
lids	S	QC I	Level I QC Package					
L14394-3		DPG 593 S24		06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Level 1 QC								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:03-DEC-93				
Solids	C	AS	Arsenic	Expires:03-DEC-93				
Solids	C	BA	Barium	Expires:03-DEC-93				
Solids	C	CD	Cadmium	Expires:03-DEC-93				
Solids	C	CR	Chromium	Expires:03-DEC-93				
Solids	C	HG	Mercury	Expires:03-DEC-93				
Solids	C	PB	Lead	Expires:03-DEC-93				
Solids	C	SE	Selenium	Expires:03-DEC-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93	june 10			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93	june 10			2 Contain
Solids	S	QC I	Level I QC Package					
L14394-4		DPG 593 S25		06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Level 1 QC								
Solids	P	D LIST METALS	8 RCRA					
Solids	C	AG	Silver	Expires:03-DEC-93				
Solids	C	AS	Arsenic	Expires:03-DEC-93				
Solids	C	BA	Barium	Expires:03-DEC-93				
Solids	C	CD	Cadmium	Expires:03-DEC-93				
Solids	C	CR	Chromium	Expires:03-DEC-93				
Solids	C	HG	Mercury	Expires:03-DEC-93				
Solids	C	PB	Lead	Expires:03-DEC-93				
Solids	C	SE	Selenium	Expires:03-DEC-93				
Solids	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93	june 10			1 Contain
Solids	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93	june 10			2 Contain
Solids	S	QC I	Level I QC Package					

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Jun 10 1993, 02:30 pm

Login Number: L14394
Account: KLE100 Kleinfelder
Site : PROJECT# 30-2025-15.001

Laboratory Sample Number			Client Sample Number / Method Description		Collect Date	Receive Date	PR	Due Date	
L14394-5			DPG 593 S26		06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Share w/metals; Level 1 QC									
Solids	P	D LIST METALS	8 RCRA						
Solids	C	AG	Silver	Expires:03-DEC-93					
Solids	C	AS	Arsenic	Expires:03-DEC-93					
Solids	C	BA	Barium	Expires:03-DEC-93					
Solids	C	CD	Cadmium	Expires:03-DEC-93					
Solids	C	CR	Chromium	Expires:03-DEC-93					
Solids	C	HG	Mercury	Expires:03-DEC-93					
Solids	C	PB	Lead	Expires:03-DEC-93					
Solids	C	SE	Selenium	Expires:03-DEC-93					
Solids	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93					
Solids	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93		june 10			1 Contain
Solids	S	QC I	Level I QC Package						
L14394-6			DPG 593-07		06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Level 1 QC									
Water	P	D LIST METALS	8 RCRA						
Water	C	AG	Silver	Expires:03-DEC-93					
Water	C	AS	Arsenic	Expires:03-DEC-93					
Water	C	BA	Barium	Expires:03-DEC-93					
Water	C	CD	Cadmium	Expires:03-DEC-93					
Water	C	CR	Chromium	Expires:03-DEC-93					
Water	C	HG	Mercury	Expires:03-DEC-93					
Water	C	PB	Lead	Expires:03-DEC-93					
Water	C	SE	Selenium	Expires:03-DEC-93					
Water	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93		june 10			1 Contain
ater	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93		june 10			1 Contain
ater	S	QC I	Level I QC Package						
L14394-7			DPG 593-07 8		06-JUN-93	10-JUN-93	PA	21-JUN-93	
DNT, HMX, RDX, TNT only; Level 1 QC									
Water	P	D LIST METALS	8 RCRA						
Water	C	AG	Silver	Expires:03-DEC-93					
Water	C	AS	Arsenic	Expires:03-DEC-93					
Water	C	BA	Barium	Expires:03-DEC-93					
Water	C	CD	Cadmium	Expires:03-DEC-93					
Water	C	CR	Chromium	Expires:03-DEC-93					
Water	C	HG	Mercury	Expires:03-DEC-93					
Water	C	PB	Lead	Expires:03-DEC-93					
Water	C	SE	Selenium	Expires:03-DEC-93					
Water	S	DIG-MET	Total Metal Digestion	Expires:03-DEC-93		june 10			1 Contain
Water	S	EXP-CYC	Cyclic Explosives	Expires:20-JUN-93		june 10			1 Contain
Water	S	QC I	Level I QC Package						

Signature: ______________________

Date: ______________________

AMERICAN
WEST
ANALYTICAL
LABORATORIES

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84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:
14368-03

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG 693 S73

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: ______________
Laboratory Supervisor

Report Date 6/17/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 9, 1993
Sample Number: 14368

Contact: Joel Carson
Received By: Judi Smith
Set Description: Three Water & Six Solid Samples

Quality Control Results

Units = (ppb)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14368-02	1,4-Dichlorobenzene	0.0	200.	33.5	39.4	17.7	19.7	10.5
14368-02	2,6-Dinitrotoluene	0.0	200.	83.1	95.3	41.5	47.6	13.7
14368-02	Pentachlorophenol	0.0	200.	49.1	54.3	24.5	27.1	10.1
14368-02	Phenol	0.0	200.	91.6	101.9	45.8	51.0	10.7
14368-02	Pyrene	0.0	200.	73.5	86.5	36.7	43.2	16.3
14367-01	Benzene	0.0	20.0	20.7	21.7	103.5	108.5	-4.7
14367-01	Chlorobenzene	0.0	20.0	20.1	22.9	100.5	114.5	-13.0
14367-01	1,2-Dichloroethane	0.0	20.0	21.4	22.5	107.0	112.5	-5.0
14367-01	Toluene	0.0	20.0	20.2	22.9	101.0	114.5	-12.5
14367-01	Trichloroethene	0.0	20.0	20.5	22.6	102.5	113.0	-9.7

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100 \qquad \%SR = \frac{(SSR - SR)}{SA} * 100 \qquad \%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: /Laboratory Supervisor

Report Date 6/16/93

ORGANIC ANALYSIS REPORT

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
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84115

(801) 263-8686
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Client: Kleinfelder
Date Received: June 9, 1993
Set Identification Number: 14368
Set Description: Three Water & Six Solid Samples

Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	June 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-03	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S73

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = μg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

Report Date 6/17/93

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Lab Sample ID. Number:
14368-03

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG 693 S73

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

Report Date 6/17/93

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Lab Sample ID. Number: 14368-02

Field Sample ID. Number: Project #30-2025-14.001/Dugway OB/OD/DPG 693 S72

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

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AMERICAN WEST ANALYTICAL LABORATORIES

Lab Sample ID. Number:
14368-02

Field Sample ID. Number:
Project #30-2025-14.001/Dugway OB/OD/DPG 693 S72

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

463 West 3600 South
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Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All solid compounds are reported in Dry Weight Basis.

Released by: [signature]
Laboratory Supervisor

Report Date 6/17/93

AMERICAN
WEST
ANALYTICAL
LABORATORIES

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Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
1,2,4-Trichlorobenzene	2.0	< 2.0
1,1,1-Trichloroethane	2.0	< 2.0
1,1,2-Trichloroethane	2.0	< 2.0
Trichloroethene	2.0	< 2.0
Trichlorofluoromethane	2.0	< 2.0
1,2,3-Trichloropropane	2.0	< 2.0
1,1,2-Trichlorotrifluoroethane	2.0	< 2.0
1,2,3-Trimethylbenzene	2.0	< 2.0
1,2,4-Trimethylbenzene	2.0	< 2.0
1,3,5-Trimethylbenzene	2.0	< 2.0
Vinyl acetate	5.0	< 5.0
Vinyl chloride	5.0	< 5.0
ortho-Xylene	2.0	< 2.0
meta and para-Xylene	2.0	< 2.0

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
None Detected	20.	

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

Released by: [signature]
Laboratory Supervisor

Report Date 6/15/93

ORGANIC ANALYSIS REPORT

AMERICAN
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LABORATORIES

Client: Kleinfelder
Date Received: June 9, 1993
Set Identification Number: 14368
Set Description: Three Water & Six Solid Samples

Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	June 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-02	Project #30-2025-14.001/Dugway OB/OD/DPG 693 S72

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
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Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

Report Date 6/17/93

ORGANIC ANALYSIS REPORT

AMERICAN
WEST
ANALYTICAL
LABORATORIES

463 West 3600 South
Salt Lake City, Utah
84115

(801) 263-8686
Fax (801) 263-8687

Client: Kleinfelder
Date Received: June 9, 1993
Set Identification Number: 14368
Set Description: Three Water & Six Solid Samples

Contact: Joel Carson
Received By: Judi Smith

Analysis Requested:	Method Ref. Number:	Date Analyzed:
Volatile Organics	EPA # 624 (SW-846 #8260) Purge & Trap GC/MS	June 9, 1993

Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
Acetone	10.	< 10.
Acrolein	10.	< 10.
Acrylonitrile	10.	< 10.
Benzene	2.0	< 2.0
Bromobenzene	2.0	< 2.0
Bromochloromethane	2.0	< 2.0
Bromodichloromethane	2.0	< 2.0
Bromoform	2.0	< 2.0
Bromomethane	5.0	< 5.0
2-Butanone	10.	<10.
n-Butylbenzene	2.0	< 2.0
sec-Butylbenzene	2.0	< 2.0
tert-Butylbenzene	2.0	< 2.0
Carbon disulfide	2.0	< 2.0
Carbon tetrachloride	2.0	< 2.0
Chlorobenzene	2.0	< 2.0
Chloroethane	5.0	< 5.0
2-Chloroethyl vinyl ether	10.	< 10.
Chloroform	2.0	< 2.0
bis-2-Chloroisopropyl ether	5.0	< 5.0
Chloromethane	5.0	< 5.0
2-Chlorotoluene	2.0	< 2.0
4-Chlorotoluene	2.0	< 2.0
Dibromochloromethane	2.0	< 2.0
1,2-Dibromo-3-chloropropane	2.0	< 2.0

Report Date 6/15/93

AMERICAN WEST ANALYTICAL LABORATORIES

Lab Sample ID. Number:	Field Sample ID. Number:
14368-Method Blank	Method Blank

Analytical Results — VOLATILE ORGANIC COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
1,2-Dibromoethane	2.0	< 2.0
Dibromomethane	2.0	< 2.0
1,2-Dichlorobenzene	2.0	< 2.0
1,3-Dichlorobenzene	2.0	< 2.0
1,4-Dichlorobenzene	2.0	< 2.0
Dichlorodifluoromethane	2.0	< 2.0
1,1-Dichloroethane	2.0	< 2.0
1,2-Dichloroethane	2.0	< 2.0
1,1-Dichloroethene	2.0	< 2.0
cis-1,2-Dichloroethene	2.0	< 2.0
trans-1,2-Dichloroethene	2.0	< 2.0
1,2-Dichloropropane	2.0	< 2.0
1,3-Dichloropropane	2.0	< 2.0
2,2-Dichloropropane	2.0	< 2.0
1,1-Dichloropropene	2.0	< 2.0
total-Dichloropropene	2.0	< 2.0
1,4-Dioxane	2.0	< 2.0
Ethyl acetate	5.0	< 5.0
Ethyl ether	5.0	< 5.0
Ethylbenzene	2.0	< 2.0
Hexachlorobutadiene	2.0	< 2.0
2-Hexanone	5.0	< 5.0
Isopropylbenzene	2.0	< 2.0
p-Isopropyltoluene	2.0	< 2.0
Methylene chloride	2.0	< 2.0
4-Methyl-2-pentanone	5.0	< 5.0
Naphthalene	2.0	< 2.0
n-Propylbenzene	2.0	< 2.0
Styrene	2.0	< 2.0
1,1,1,2-Tetrachloroethane	2.0	< 2.0
1,1,2,2-Tetrachloroethane	2.0	< 2.0
Tetrachloroethene	2.0	< 2.0
Toluene	2.0	< 2.0
1,2,3-Trichlorobenzene	2.0	< 2.0

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Lab Sample ID. Number:
14368-03

Field Sample ID. Number:
Project #30-2025-160.01/Dugway OB/OD/DPG 693 S73

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
Benzo(k)fluoranthene	60.	<60.
bis(2-Chloroethoxy)methane	60.	<60.
bis(2-Chloroethyl)ether	60.	<60.
bis(2-Chloroisopropyl)ether	60.	<60.
bis(2-Ethylhexyl)phthalate	60.	<60.
4-Bromophenyl phenyl ether	60.	<60.
4-Chloroaniline	60.	<60.
Butylbenzyl phthalate	60.	<60.
2-Chloronaphthalene	60.	<60.
4-Chlorophenyl phenyl ether	60.	<60.
Chrysene	60.	<60.
Dibenz(a,h)acridine	150.	<150.
Dibenz(a,h)anthracene	150.	<150.
Dibenzofuran	60.	<60.
1,2-Dichlorobenzene	60.	<60.
1,3-Dichlorobenzene	60.	<60.
1,4-Dichlorobenzene	60.	<60.
3,3'-Dichlorobenzidine	60.	<60.
Diethyl phthalate	60.	<60.
7,12-Dimethylbenz(a)anthracene	60.	<60.
Dimethyl phthalate	60.	<60.
Di-n-butyl phthalate	60.	<60.
2,4-Dinitrotoluene	60.	<60.
2,6-Dinitrotoluene	60.	<60.
Di-n-octyl phthalate	60.	<60.
1,2-Diphenylhydrazine	60.	<60.
Fluoranthene	60.	<60.
Fluorene	60.	<60.
Hexachlorobenzene	60.	<60.
Hexachlorobutadiene	60.	<60.
Hexachlorocyclopentadiene	60.	<60.
Hexachloroethane	60.	<60.
Indene	60.	<60.
Indeno(1,2,3-cd)pyrene	150.	<150.
Isophorone	60.	<60.

Report Date 6/17/93

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Lab Sample ID. Number: 14368-03

Field Sample ID. Number: Project #30-2025-160.01/Dugway OB/OD/DPG 693 S73

Analytical Results — BASE/NEUTRAL COMPOUNDS

Units = µg/kg (ppb) †

Compound:	Detection Limit:	Amount Detected:
1-Methylnaphthalene	60.	<60.
2-Methylnaphthalene	60.	<60.
7-Methyl chrysene	60.	<60.
Naphthalene	60.	<60.
2-Nitroaniline	60.	<60.
3-Nitroaniline	60.	<60.
4-Nitroaniline	60.	<60.
Nitrobenzene	60.	<60.
N-Nitrosodimethylamine	60.	<60.
N-Nitrosodi-n-propylamine	60.	<60.
N-Nitrosodiphenylamine	60.	<60.
Phenanthrene	60.	<60.
Pyrene	60.	<60.
Quinoline	60.	<60.
1,2,4-Trichlorobenzene	60.	<60.

Analytical Results — TENTATIVELY IDENTIFIED COMPOUNDS

Units = µg/kg (ppb)

Compound:	Detection Limit:	Amount Detected:
Total Aliphatic Hydrocarbons	1,000.	2,000. A

< Value = None detected above the specified method detection limit, or a value that reflects a reasonable limit due to interferences.

T = Trace. Detectable amount is lower than the practical quantitation limit for this compound.

† = All compounds are reported in Dry Weight Basis.

A = Approximation based on relative response or a 1:1 response factor with the appropriate internal standard.

Released by: [signature]
Laboratory Supervisor

Report Date 6/17/93

QUALITY CONTROL REPORT

Client: Kleinfelder
Date Received: June 30, 1993
Sample Number: 14637

Contact: Renee Zollinger
Received By: Elona Hayward
Set Description: Five Water Samples

Quality Control Results

Units = (ppm)

Sample #	Compound	Original Concentration (SR)	Spike Added (SA)	Spike Result (SSR)	Spike Dup Result (SDR)	% Spike Recovery (%SR)	% Spike Dup Recovery (%SDR)	% Duplicate Difference (RPD)
14637-01	Arsenic	0.0	0.067	0.070	0.070	104.5	104.5	0.0
14637-01	Barium	0.004	1.1	1.13	1.07	102.4	96.9	5.5
14637-01	Cadmium	0.0	1.1	1.22	1.17	110.9	106.4	4.2
14637-01	Chromium	0.0	1.1	1.19	1.13	108.2	102.7	5.2
14637-01	Lead	0.0	1.1	1.14	1.12	103.6	101.8	1.8
14637-01	Mercury	0.0	0.005	0.00417	0.00457	83.4	91.4	-9.2
14637-01	Selenium	0.0	0.067	0.077	0.077	114.9	114.9	0.0
14637-01	Silver	0.0	1.1	1.09	1.05	99.1	95.5	3.7
14637-02	RDX	0.00	5.00	4.51	4.52	90.2	90.4	-0.2

$$RPD = \frac{(SSR - SDR)}{\left(\frac{SSR + SDR}{2}\right)} * 100$$

$$\%SR = \frac{(SSR - SR)}{SA} * 100$$

$$\%SDR = \frac{(SDR - SR)}{SA} * 100$$

Released by: ______________________
Laboratory Supervisor

Report Date 7/7/93

II.H. PROTECTION OF SURFACE WATER: 264.601(b); R315-8-16

All information concerning the occurrence of surface water in the vicinity of the OB/OD Area and the methods used to prevent the migration of waste to surface waters is presented in Section III.B4.

II.I. **OTHER APPLICABLE REGULATIONS**: 270.14(b)(20), 270.3; R315-3-5(b)(20)

Other federal laws, as as required by R315-3-5(b)(20), 40 CFR 270.14(b)(20) and and 40 CFR 270.3, were reviewed for their applicability to DPG. Several of these laws are not applicable to DPG due to the absence of permanent bodies of surface water within the boundaries of DPG and its location in the Great Salt Lake Desert, the Cedar Mountains, and an upland portion of Skull Valley. The only surface water at DPG may be found in intermittent streams, which flow from the surrounding mountain ranges, and occasionally in shallow playas that form in the Great Salt Lake Desert during times of high precipitation. For these reasons, the Wild and Scenic Rivers Act, the Coastal Zone Management Act, and the Fish and Wildlife Coordination Act are not applicable to DPG.

The Endangered Species Act requires that the EPA ensure any action, which it authorizes, is not likely to jeopardize the continued existence of any endangered or threatened species, or adversely affect its critical habitat. Species lists from the U.S. Fish and Wildlife Service indicate that there are two endangered species in Tooele County where DPG is located. These two species are the Bald Eagle (Haliaeetus leucocephalus) and the Peregrine Falcon (Falco peregrinus). Mr. Bob Benton, a biologist with the U.S. Fish and Wildlife Service in Salt Lake City, was contacted 27 September 1990 to determine whether the U.S. Fish and Wildlife Service had any concerns for the two endangered species in this area. Mr. Benton did not have any special concerns regarding the endangered species. He believed that the hazardous waste management activities at DPG will not further jeopardize the continued existence of either of these endangered species or adversely affect their critical habitat.

The National Historic Preservation Act of 1966 requires that the EPA, before issuing a RCRA permit, adopt measures when feasible to mitigate potential adverse effects of the permitted activity on properties listed, or eligible for listing, in the National Register of Historic Places (NRHP). Review of *An Archeological Overview and Management Plan for the Dugway Proving Ground* indicates that there are a number of archeological sites at DPG. The known sites are located near Wig Mountain, in the Cedar Mountains, along Pismire Wash, and in the sand dune area. The Lincoln Highway Bridge, located in Ditto, was listed on the NRHP on 12 May 1975. None of these sites, however, are located in areas that are likely to be affected by the hazardous waste management activities at DPG.

II.I1 **Unit is Classified as a "Miscellaneous Unit"**: 264.600

With this application, DPG is seeking a RCRA operating permit to thermally treat reactive hazardous waste by OB/OD. Units used to treat reactive wastes in this manner are classified as miscellaneous (Subpart X) units and are regulated by the State of Utah under R315-8-16. DPG is seeking to permit one Subpart X unit that will be used to demilitarize waste propellants, explosives, and pyrotechnics (PEP) by either OB within burn pans or OD on the ground surface.

II.I2 **Unit is Classified as a Process Vent**: 264.1030

The Process Vent requirements of Part 264 Subpart AA are not applicable to the OB/OD Area.

II.I3 **Unit is Subject to Equipment Leaks**: 264.1050

The Equipment Leaks requirements of Part 264 Subpart BB are not applicable to the OB/OD Area.