

REPORTS

YEAR(S):





Intera Incorporated One Park Square

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DEC 2 4 2003 Environmental Bureau Oil Conservation Division

December 22, 2003

Ms. Martyne J. Kieling Environmental Geologist New Mexico Oil Conservation Division 1220 South Saint Francis Drive Santa Fe, NM 87505

RE: Phase I Investigation and Remediation – Araho, Inc. Former Injection Well Disposal Facility - Final Report

Ms. Kieling:

INTERA Inc. (INTERA) appreciates the opportunity to work with the New Mexico Oil Conservation Division. Enclosed you will find three original copies of the final letter report "*Phase I Investigation and Remediation – Araho, Inc. Former Injection Well Disposal Facility*". INTERA does not anticipate any other project activities after the completion of the enclosed report and considers the project completed at this time.

If you have any questions regarding the enclosed report, please do not hesitate to contact me at (505) 246-1600 ext. 219. Thank you very much.

Sincerely, **INTERA Inc.**

Joseph Tracy, RG Project Manager

Enclosure: Summary Report – Araho, Facility in Lea County, New Mexico (3 copies)



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DEC 2 4 2003 Environmental Bureau Oil Conservation Division INTERA Incorporated One Park Square 6501 Americas Parkway NE Suite 820 Albuquerque, NM 87110 Telephone: 505 246 1600 Fax: 505 246 2600

December 19, 2003

Ms. Martyne J. Kieling Environmental Geologist New Mexico Oil Conservation Division 1220 South Saint Francis Drive Santa Fe, NM 87505

RE: Phase I Investigation and Remediation – Araho, Inc. Former Injection Well Disposal Facility, Lea County, New Mexico

Ms. Kieling:

The New Mexico Oil Conservation Division (NMOCD) contracted INTERA Incorporated (INTERA) to perform a Phase I Environmental Site Investigation and Preliminary Remediation Measures at the Araho, Inc. former injection well disposal facility (Site) located in Lea County, New Mexico. The location of the Site is shown on Figure 1. INTERA performed the work under the State of New Mexico General Services Department Purchasing Division Price Agreement No. 30-805-09-18056. The original INTERA Scope of Work (SOW) as authorized by NMOCD included the following action items:

- Contact One-Call (New Mexico underground utility locating service) and map the buried pipelines and electrical hazards on the Site based upon the One-Call service markings;
- Perform a naturally occurring radioactive materials (NORM) survey of all pipes and equipment prior to disposal. A registered NORM surveyor must perform the NORM surveys;
- Remove material within the tanks for recycling, approximately 1,600 barrels (bbl);
- Remove the tanks for recycling or disposal;
- Remove trash at the Site to include barrels, buckets, batteries, pipes (buried and surface), electrical meters, and other trash items;
- Investigate the nature and extent of contamination beneath the tank footprints by trenching with a backhoe;
- Investigate the extent of chloride contamination in the surface soils at the Site (per the NMOCD SOW, 10 6-inch compost samples will be taken);
- Provide an estimate for the volume and cost to remove the contaminated soil material (based on the results of the trenching and sample analysis);



Ms. Martyne Kieling New Mexico Oil Conservation Division December 19, 2003 Page 2

- Provide an estimate for the volume and cost to excavate and construct compost piles on the Site (according to NMOCD SOW specifications);
- Propose any additional remediation techniques which would be cost effective (based on Phase I findings); and
- Prepare a final report.

SUMMARY OF ACTIVITIES

Task 1 – Project Development and Coordination

INTERA developed a project schedule, site-specific health and safety plan (HASP), and an internal work plan in order to safely and effectively complete the project. The project planning was coordinated with the NMOCD Project Manager, Ms. Martyne Kieling. A complete copy of INTERA's HASP is included in Attachment A.

Task 2 - Utility Locate

INTERA contacted New Mexico One-Call on September 29 and October 9, 2003, to perform utility markings of buried utilities located at the Site. (A second utility locate was requested because of a delay in the start date of the remediation work. Utility markings are only valid for a period of two weeks after the markings have been made on the ground surface). INTERA was issued the following ticket numbers from the New Mexico One-Call Center:

2003400562 – September 29, 2003 **2003413085** – October 9, 2003

The New Mexico One-Call Center contacted utility owners EOTT-Texas/New Mexico, Gasco of Lovington, and Duke Energy Field Services. These companies are registered with New Mexico One-Call Center as owning and operating underground utilities in the area of the Site. INTERA was not advised of other utilities companies which may have subsurface utilities in the area by the New Mexico One-Call Center.

No subsurface utilities were observed to be present at the Site or transecting it. One buried natural gas line is located adjacent to the east boundary of the Site and is orient parallel to it. The location of the buried natural line is shown on Figure 2. It is believed that this natural gas line is operated by PNM. No other subsurface utilities were located on or near the Site.



Task 2 - NORM Survey

INTERA was authorized by the NMOCD to perform a NORM survey of all "pipes and equipment" scheduled to be removed from the Site. INTERA subcontracted the NORM Survey work to Mr. James Allen of Safety and Environmental Solutions, Inc. (SESI), located in Hobbs, New Mexico, to perform the NORM Survey. Mr. Allen is registered in accordance with Part 2 of the New Mexico Radiation Control Bureau Protection Regulations (New Mexico Administrative Code [NMAC] 20.3.2). Mr. Allen's Registration Numbers are No. 398-6N (Radiation Safety Consultant to Oil and Gas NORM) and No. 434-9N (Radiation Safety Training and Oil and Gas NORM).

Mr. Konrad Clark of INTERA mobilized to the Site on October 8, 2003 to oversee Mr. Allen as he performed the NORM survey. During this initial mobilization to the Site, only the tanks located at the Site were surveyed; other equipment and piping was surveyed at a later date. A total of eight tanks were surveyed. The locations of Tank 1 through Tank 8 are shown on Figure 2. The results of the initial NORM survey are shown on Table 1.

October 6, 2005		
Tank Designation	NORM Survey Reading (mR)	
Tank 1, 3000 bbl	58	
Tank 2, 210 bbl	24	
Tank 3, 750 bbl	52	
Tank 4, 500 bbl	18	
Tank 5, 500 bbl	28	
Tank 6, 200 bbl	46	
Tank 7, 200 bbl	26	
Tank 8, 750 bbl	30	

Table 1 – Initial NORM Survey ResultsOctober 8, 2003

All NORM Survey results shown in microroentgens per hour (mR/hr)

Initial NORM Survey results showed relatively elevated levels of NORM within Tank 1, Tank 3, and Tank 6. The background NORM Survey readings taken by Mr. Allen on October 8, 2003, were between 10 -14 microroentgens per hour (mR/hr). The background readings were taken 10-feet within the southern fence line. Sludges and scales contained in oil, gas, and water production equipment containing more than 50 mR/hr are required to be handled and disposed of as NORM regulated waste (New Mexico Administrative Code [NMAC] 20.3.14.1403.A). Because the tanks which showed elevated readings still contained liquids, it was assumed that the presence of these liquids caused NORM levels to increase in these specific tanks. Mr. Allen stated that these NORM levels would most likely decrease once all fluids were removed from the



tanks. The NORM Survey was scheduled to continue once the fluid from these tanks was removed. The NORM Survey was also scheduled to be conducted on all underground piping (associated with the disposal injection facility) after it was removed from the subsurface and placed in a staging area.

Mr. Allen returned to the Site on October 22, 2003. At that time, all subsurface piping had been removed and staged in one area. Also, all fluids and sludges had been removed from the on-site tanks. Mr. Allen performed a NORM survey of the piping and scrap metal and indicated the level of radiation to be <20 mR/hr. Tank 1, Tank 3, and Tank 6 were also re-surveyed by Mr. Allen. The radiation levels of Tank 1 and Tank 6 was indicated to be <20 mR/hr. The radiation level of Tank 3 indicated the level of Tank

On October 22, 2003, Mr. Allen also performed a NORM survey of the sludge material removed from Tank 1 for disposal at the Rhino Facility. The sludge/soil mix contained a reading of 25 mR/hr, which is below the regulatory level, and therefore the sludge/soil material was determined to be suitable for land farming.

On October 23, 2003, Mr. Allen returned to the Site and performed an external NORM survey of two 6-inch diameter PVC pipes. These pipes were removed from the subsurface after Mr. Allen left the Site on October 22, 2003. The survey results indicated the level of radiation to be <20 mR/hr. The results of the NORM Survey conducted on October 22 and October 23, 2003, are outlined below. A complete copy of the NORM survey report is included in Attachment B.

Tank Designation	NORM Survey Reading (mR)	
Tank 1, 3000 bbl	<20	
Tank 3, 750 bbl	46	
Tank 6, 200 bbl	<20	
All piping, scrap metal*	<20	
Sludge (disposal – landfarming)	25	

Table 2 – Additional NORM Survey ResultsOctober 22 and 23, 2003

All NORM Survey results shown in microroentgens per hour (mR/hr)

* - scrap metal survey consisted of small pieces of piping and miscellaneous metal pieces

Task 3 - Field Investigation and Phase I Site Remediation

INTERA conducted the field investigation and Phase I Site Remediation at the Araho Facility in October 2003. A photograph log depicting the various field activities conducted is included in Attachment C.



Removal of Material from Tanks

Approximately 3,565 bbls of liquid (petroleum product mixed with water) were removed from the Site and disposed of at the Sundance Services in Eunice, Lea County, New Mexico. The waste material was classified as "produced water/tank bottoms" and complete copies of each liquid waste manifest are included in Attachment D. Sundance Services is an OCD-approved facility and the 3,565 bbls of liquid were disposed of in accordance with the regulations of NMOCD.

The liquid waste material accepted at Sundance Services is processed by heating the waste before it is sent through a centrifuge. The centrifuge separates waste and generates reclaimable oil, waste water, and solids. The reclaimable oils are re-used, the waste water is evaporated in evaporation ponds, and the solids are landfilled.

Approximately 500 bbls of a semi-solid liquid located in the bottom of Tank 1 (3,000 bbl tank) proved too viscous to be pumped from the tank, and was also unable to be liquefied by adding high-pressure water and/or hot water. It was determined that this material would have to be mixed with sand and disposed of as a sludge. The semi-solid petroleum liquid was mixed with sand within the tank (the top of the tank was removed and the bottom third of the tank remained in place) using a Trackhoe excavator. This semi-solid petroleum material was mixed with sand until it was near a solid state and then transported from the Site. A total of 443 cubic yards of sludge (petroleum semi-solid/sand mixture) was transported from the Site to the Rhino Goo Yea South Disposal Facility eight miles south of Hobbs, New Mexico. The waste material is disposed of by the process of landfarming at the Rhino Goo Yea South Disposal Facility. The waste material was classified as "mix bottom soils", "dry-mixed bottoms", "mixed soil dry" or "hydrocarbon impacted soils"; and copies of each manifest are included in Attachment E.

It should be noted that the tank bottoms of Tank 1 (3,000 bbl) and Tank 3 (750 bbl) contained 12- to 14-inches of concrete in the bottom of each tank. It is believed that the elevated NORM Survey results observed at the bottoms of these tanks was caused by the presence of the concrete. Tank 1 and Tank 3 were disassembled on Site, and the concrete was removed from the bottom of each tank and disposed of separately.

Removal and Disposal of Tanks

A total of eight tanks were present at the Site at the initiation of the remediation work. The tanks present at the Site, the size of each tank, and the approximate volume estimates of waste material contained in each tank at the beginning of remedial activities are outlined in Table 3.



Tank Designation Size Initial Contents NMO				
Zum 205-Binton		Volume Estimates		
Tank 1	3000 bbl	2000 bbls of material		
Tank 2	210 bbl	50 bbls of material		
Tank 3	750 bbl	250 bbls of material		
Tank 4	500 bbl	empty		
Tank 5	500 bbl	100 bbls of material		
Tank 6 (fiberglass)	200 bbl	200 bbls of material		
Tank 7	200 bbl	empty		
Tank 8	750 bbl	empty		

Table 3 – Tank Designation and Size

The tanks were removed from the Site on October 22 and October 23, 2003, following the removal of petroleum material (if applicable). In addition, the interior of tanks containing residues were steam-cleaned prior to removal from the Site. The steel tanks were transported from the Site to Hobbs Iron & Metal, Inc. of Hobbs, New Mexico. A complete copy of the tank acceptance manifest is included in Attachment F. These tanks are scheduled to be recycled. The fiberglass tank was demolished on-site and disposed of with the miscellaneous waste taken from the Site in roll-off dumpsters.

Prior to disposal, NMOCD has sampled the paint on the tanks for the presence of lead-based paint (LBP). Copies of the LBP analytical results were provided to Rhino for use during consideration of disposal options for the tanks. A complete copy of the LBP analytical results are included in Attachment G.

Removal and Disposal of Piping

Figure 3 is a Site facility map showing the locations of the subsurface piping removed from the Site. The amount of piping removed is a substantial increase from NMOCD's estimated amount of piping present at the facility prior to remedial work. The piping was removed from the surface and subsurface and placed in a stockpile for the NORM Survey prior to placement in roll-off waste containers. All piping present on the ground surface was removed from the Site. Where indications of piping entering the ground surface were observed, the piping runs were excavated and removed from the subsurface for disposal. The NMOCD provided a map of subsurface piping that was used as a guide, as well as visual observations of subsurface piping identified in the field. All above- and below-ground piping associated with the former Araho Injection Well Disposal facility was removed from the Site to be recycled.



Removal of Trash (barrels, buckets, pipes, electric meters, miscellaneous debris)

A total of 44 cubic yards of miscellaneous debris were removed from the Site and transported for disposal. The waste material was classified as "below grade pipe and associated trash from pipe and tank removal" and disposed of at Controlled Recovery, Inc. of Hobbs, New Mexico and Camino Real Environmental Center of Sunland Park, New Mexico. The majority of this waste was a non-metallic type of waste (i.e. plastics, rags, paper, wood, etc.). Copies of the waste tickets are included in Attachment H.

Task 3 - Investigate the Nature and Extent of Contamination

INTERA documented the locations of the heavy surface soil-stained areas at the Site (see Figure 4). The stained areas, as well as the tank footprints, were investigated by backhoe trenching. Trenches were constructed across the diameters of the tank footprints as well as through heavily stained areas.

The locations and depth of the petroleum-impacted soil samples are shown on Figure 5. Efforts were made to collect representative samples of the conditions within each tank footprint as well as within each stained area and along the former major piping runs.

Prior to sample submission to the analytical laboratory, the samples were split and analyzed with a photoionization detector (PID). The PID was equipped with a 10.5 electron-volt (eV) ionization potential electron-volt (eV) lamp and was used to screen the subsurface soil samples for total volatile organic compounds (VOCs) following heated headspace techniques.

INTERA followed the New Mexico Environment Department (NMED) Petroleum Storage Tank Bureau (PSTB) Standard Operating Procedure (SOP) for heated headspace reading collection. The 10.5 eV lamp gave the PID the sensitivity required to identify the kinds of organic compounds suspected of being present in Site soils. The PID screens ionizable organic compound concentrations in air and gives direct measurement readouts in parts per million (ppm). The PID determines the concentration of total ionizable organic compounds, but does not differentiate between specific compounds. The operational range of the PID is 0 to 2,000 ppm, with a minimum instrument detection of 0.1 ppm. Soil samples were placed in glass jars and covered with aluminum foil. The aluminum foil was secured on each jar with a rubber band. The jars were placed in direct sunlight to warm to ambient air temperature. The tip of the PID probe was then used to pierce the foil and inserted into the jar above the soil sample. The VOC concentration in the air above the soil sample (or headspace) was analyzed using the PID. No PID headspace readings were detected in any of the subsurface soil samples screened, with the



exception of soil samples T3-4' and T1-3'. The PID detected VOCs at concentrations of 65 ppm in soil sample T3-4' and 650 ppm in soil sample T1-3'.

An approximate 80-feet x 120-feet 10 point grid was constructed and 10 sample points were plotted at the Site for the collection of chloride samples. Per the NMOCD SOW, INTERA was to construct a grid and collect 10 6-inch "compost" (i.e., composite) soil samples and submit them for chloride analysis. The chloride samplings locations are shown in Figure 6.

A total of 23 (20 primary samples and 3 duplicate samples) soil samples were submitted for laboratory analysis. Each soil sample was submitted for analysis of total petroleum hydrocarbons (TPH) by EPA Method 8015; modified for diesel fuel and for benzene, toluene, ethyl benzene, and total xylenes (BTEX) by EPA Method 8021; and chloride content by EPA Method 325.2. An additional 12 (10 primary samples and 2 duplicate samples) soil samples were submitted for chloride analysis only. The soil samples were submitted to Pinnacle Laboratories, Inc. in Albuquerque, New Mexico, for analysis. The soil sample analytical results are outlined in Table 4 and Table 5. A complete copy of the laboratory analytical report is included in Attachment I. Collection of the soils samples on October 25, 2003, was witnessed by Mr. Eddie Seay of Consulting Services, Hobbs, New Mexico. Mr. Seay is a consultant representing the City of Lovington, New Mexico.

Sample Designation	Results EPA Method 8015	
• •	Total Petroleum Hydrocarbons	
T3-2'	3880	
T3-4'	480	
T1W-1'	4050	
T1E-1'	338	
RS1-3'	106	
RS2-2'	2923	
T2-3'	7270	
T1/3-3'	177	
RS3-3'	470	
T4-2'	898	
T4-2B' (duplicate)	180	
T5-2'	1228	
Тб-3'	32	
T6-3B' (duplicate)	63	
S6-2'	10,970	

Table 4 – Soil Sample Results EPA Method 8015 – Total Petroleum Hydrocarbons



Sample Designation	Results EPA Method 8015 Total Petroleum Hydrocarbons
RS4-3.5'	<10
RS5-1'	1200
DL1-2'	7490
DL1-2B' (duplicate)	9770
S9-2'	1150
S1-0.5'	4800
S1-1N'	440
S8-0.5'	1000
NMED TPH Industrial Direct	2000
Exposure Guideline (NMED,	
2003)	
NMOCD TPH Remediation	100
Guideline (NMOCD, 1993)*	

Table Notes:All TPH results shown in milligrams per kilogram (mg/Kg)* - TPH Remediation Guideline based on a total ranking score of 30

NMED has developed TPH soil screening guidelines (*NMED TPH Screening Guidelines*, dated June 24, 2003) to assess areas of soil contamination that are the result of the releases of petroleum products. The TPH analysis conducted on soil samples from the Site are to be used to delineate the extent of petroleum-related contamination at the Site that could represent an unacceptable risk to the future users of the Site. Laboratory analysis of the soil samples showed that the petroleum carbon range indicated petroleum products present; including mineral oil, diesel fuel, No. 3 and No. 6 fuel oil, kerosene, and unknown oil. The majority of the soil samples indicated the petroleum hydrocarbon range for diesel fuel/kerosene, but because other potential petroleum products were indicated to be present, the most conservative TPH soil screening guideline will be used to evaluate TPH contaminated soils. A TPH soil screening Industrial Direct Exposure guideline of 2,000 mg/Kg will be used.

NMOCD established "Guidelines for Remediation of Leaks, Spills, and Releases", dated August 13, 1993, to guide the remediation of contaminants on all federal, state, and fee lands resulting from leaks, spills and releases of oilfield wastes or products. According to the document, NMOCD requires that corrective actions be taken for leaks, spills, or releases of any material which has a reasonable probability to injure or be detrimental to public health, fresh waters, animal or plant life, or property or unreasonably interfere with the public welfare or use of the property (NMOCD, 1993). NMOCD guidelines recommend that all highlycontaminated/saturated soils be remediated in place or excavated to the maximum extent practicable. Since none of the petroleum-impacted soil was observed to be saturated, INTERA



followed the NMOCD guidelines for unsaturated contaminated soils to determine the appropriate soil remediation action levels. The NMOCD established a ranking criteria to determine the relative threat to public health, fresh waters, and the environment.

Depth to Ground Water:	Ranking Score	
<50 feet	20	
50 – 99 feet	10	
>100 feet	0	

Based on conversations with the NMOCD Project Manger, ground water at the Site is known to be approximately 72-feet bgs. This would give the Site a score of **10** for the depth to ground water criteria.

Wellhead Protection Area:	Ranking Score	
<1000 feet from a water source	Yes = 20, No = 0	
<200 feet from a private domestic water source	Yes = 20, $No = 0$	

INTERA performed a search of the New Mexico State Engineer "WATERS" database and determined that several irrigation wells were located within the immediate area of the Site and that two irrigation wells were within a 1,000 foot radius of the Site. See Attachment J for a Site map which plots nearby wells based on New Mexico State Engineer well location information. The location of the irrigation wells (within 1,000 feet) would give the Site a score of **20** for the wellhead protection area criteria.

Distance to a Surface Water Body:	Ranking Score	
<200 horizontal feet	20	
200 – 1,000 horizontal feet	10	
>1,000 horizontal feet	0	

No surface water body are known to be present within 1,000 horizontal feet of the Site, therefore, this would give the Site a score of 0 for the distance to a surface water body criteria.

The cumulative NMOCD remediation guideline ranking score for the Site is **30**. According to the NMOCD guidelines, a ranking score of great than 19 equals a TPH remediation guideline of 100 ppm. NMOCD states that the TPH concentration is the concentration above "background",



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON Governor Joanna Prukop Cabinet Secretary

December 30, 2003

Lori Wrotenbery Director Oil Conservation Division Mr. Pat Wise City Manager City of Lovington P.O. Box 1269 Lovington, NM 88260

RE: Araho, Inc. Former Injection Well Disposal Facility – Phase I Investigation and Remediation Final Report.

Dear Mr. Wise:

The New Mexico Oil Conservation Division (OCD) has completed the Phase I investigation and remediation of the Araho, Inc. former injection well disposal facility. Enclosed please find a copy of the final report for Phase I. If you should have any questions regarding this report please give me a call at 505-476-3488.

Sincerely,

Martyne J. Kieling Environmental Geologist

cc: File GW-037



however; background is not defined by NMOCD. It is understood that "natural background" for TPH would be zero, and since contamination is not attributable to a trespassing plume, INTERA assumes background to be zero for TPH. This score also results in a benzene remediation guideline of 10 ppm and a total BTEX remediation guideline of 50 ppm.

A total of 7 of the 23 soil samples submitted for laboratory analysis were identified to contain concentrations of TPH above the NMED TPH soil screening Industrial Direct Exposure guideline of 2,000 mg/Kg. Soil samples T3-2', T1W-1', RS2-2', T2-3', S6-2', DL1-2', and S1-0.5' were identified to contain TPH concentrations greater than 2,000 mg/Kg. However, a greater area is contaminated above the NMOCD guideline, resulting in a larger, more conservative area to be remediated. A total of 21 of the 23 soil samples submitted for laboratory analysis were identified to contain concentration of TPH above the NMOCD guideline of 100 ppm. The only soil samples identified with TPH concentrations of less than 100 ppm were soil samples T6-3' and RS4-3.5'; all others exceeded 100 ppm. The areas from which these soil samples were collected should be remediated by the removal of the petroleum-contaminated soils. Confirmation soil samples should be taken and submitted for analysis to assure that the subsurface soils remaining in place have TPH concentrations of less than 100 ppm.

EPA Method 8021 – Benzene, Toluene, Ethyl Benzene, Total Xylenes (BTEX)				
Sample Designation	Benzene	Toluene	Ethyl Benzene	Total Xylenes
T6-3B' (duplicate)	< 0.025	< 0.025	<0.025	<0.050
T3-2'	0.15	0.24	0.78	0.73
T3-4'	<0.025	<0.025	<0.025	< 0.050
T1W-1'	<0.025	<0.025	<0.025	<0.050
T1E-1'	<0.025	< 0.025	0.030	< 0.050
RS1-3'	< 0.050	< 0.050	< 0.050	<0.10
RS2-2'	<0.025	<0.025	<0.025	< 0.050
T2-3'	0.43	0.17	3.6	8.6
T1/3-3'	< 0.025	<0.025	<0.025	<0.050
T4-2B' (duplicate)	<0.050	<0.050	< 0.050	<0.10
RS3-3'	<0.025	<0.025	<0.025	< 0.050
T4-2'	<0.050	<0.050	<0.050	<0.10
T5-2'	<0.050	< 0.050	0.074	<0.10
T6-3'	<0.050	< 0.050	<0.050	<0.10
S6-2'	< 0.025	<0.025	0.046	0.12
RS4-3.5'	<0.025	<0.025	<0.025	< 0.050
RS5-1'	<0.025	<0.025	<0.025	<0.050
DL1-2'	< 0.13	<0.13	0.61	1.8

Table 5 – Soil Sample Results		
Mathod 9071	Banzana Taluana Ethyl Danzana	Total Vylanas (DT



Sample Designation	Benzene	Toluene	Ethyl Benzene	Total Xylenes
S9-2'	< 0.025	<0.025	< 0.025	< 0.050
\$1-0.5 [']	< 0.025	<0.025	<0.025	< 0.050
\$1-1N'	<0.025	<0.025	<0.025	< 0.050
S8-0.5'	< 0.025	<0.025	<0.025	< 0.050
DL1-2B' (duplicate)	<0.13	<0.13	1.9	5.8
NMED BTEX	14.0	180.0	68.0	63.0
Industrial Direct				
Exposure Guideline				
(NMED, 2003)				
NMOCD Benzene	10.0	N/A	N/A	N/A
Remediation Guideline				
(NMOCD, 1993)*				
NMED Industrial Soil	5.6	180.0	68.0	63.0
Screening Levels				
(NMED, 2000)				

Table Notes: All TPH results shown in milligrams per kilogram (mg/Kg)

Table 5 outlines the results of the soil samples submitted for analysis of total BTEX by EPA Method 8021. NMED has developed "Petroleum-Related Contaminants Screening Guidelines" for use pertaining to petroleum-impacted soils, and outlines soil screening levels for benzene, toluene, ethyl benzene, and total xylenes (NMED, 2003). In addition, NMED has established a *"Soil Screening Guidance Technical Background Document"*, (NMED, 2000) which establishes soil screening levels to be used at remediation sites. These levels are similar to the "Petroleum-Related Contaminants Screening Guidelines" with the exception of the industrial soil screening level for benzene. The latest NMED guidance increases the soil screening level for benzene. The NMOCD remediation guideline for benzene is also included in the table. This value is outlined in the NMOCD remediation guidance document discussed earlier (NMOCD, 1993). All remediation guidance discussed herein and soil screening levels for BTEX are outlined in Table 5. No BTEX compounds were identified in any of the soil samples submitted for laboratory BTEX analysis above the NMED BTEX Industrial Soil Screening Guidelines, the NMED Soil Screening Levels, or the NMOCD remediation guidance for benzene concentrations and/or total BTEX.



EPA Method 525.2 - Chioride		
Sample Designation	Chloride Results – EPA Method 325.2	
T6-3B' (duplicate)	7300	
T3-2'	2700	
T3-4'	5800	
T1W-1'	990	
T1E-1'	2700	
RS1-3'	1300	
RS2-2'	2800	
T2-3'	3600	
T1/3-3'	5600	
T4-2B' (duplicate)	9700	
RS3-3'	6500	
T4-2'	11,000	
T5-2'	6300	
T6-3'	8000	
S6-2'	2800	
RS4-3.5'	2100	
RS5-1'	630	
DL1-2'	1500	
S9-2'	5400	
S1-0.5'	11,000	
S1-1N'	3400	
\$8-0.5'	1100	
DL1-2B' (duplicate)	1400	
C-1	1800	
C-2	11,000	
C-3	4100	
C-4	3000	
C-5	9300	
C-6	3900	
C-7	730	
C-8	2400	
C-9	820	
C-10	3000	
C-11 (duplicate of C-8)	2600	
C-13 (duplicate of C-2)	8900	

Table 6 – Soil Sample Results EPA Method 325.2 - Chloride

Table Notes: All TPH results shown in milligrams per kilogram (mg/Kg)



There are no NMED soil screening levels and/or NMOCD remediation guidance for concentrations of chloride in surface and subsurface soils. No other regulated or suggested levels for chloride content in soils are recognized by New Mexico state regulatory agencies. Based on discussions with the NMOCD Project Manager, the New Mexico Water Quality Control Commission Standard for chloride in ground water (250 milligrams per liter [mg/L]) has been used as a guideline for chloride in soils remediation. Background chloride concentrations in soil are not known; however, chloride soil samples C-1 and C-7 were taken in areas believed to be representative of "background" (i.e. areas believed to not have been impacted by past Site operations). The chloride concentration identified in soil sample C-1 was 1,800 mg/Kg, and the chloride concentration identified in soil sample C-7 was 730 mg/Kg. All chloride analytical results indicated that the soil samples contain more than 250 mg/Kg of chloride, and 25 soil samples were identified above the concentrations believed to be "background" levels (i.e. greater than 1,800 mg/Kg) for chloride in soils.

Quality Assurance/Quality Control (QA/QC)

QA samples were collected to measure precision and accuracy. For this project, five duplicate soil samples were collected (sample designations T6-3B', T4-2B', DL1-2B', C-11, and C-13).

Duplicates for soil samples were collected to assess sampling and analytical reproducibility. Three soil duplicate samples were analyzed for TPH and BTEX and NMWQCC-regulated metals, via the EPA Methods used for the primary samples. Five duplicate soil samples were analyzed for chloride, via the EPA Method used for the primary samples. The duplicate surface soil samples were collected from T6-3', T4-2B', DL1-2', C-8, and C-2. The relative percent difference (RPD) between the original sample and the duplicate sample for T6-3' TPH analysis was 65%. The RPD between the original sample and the duplicate sample for DL1-2' TPH analysis was 133%. The RPD between the original sample and the duplicate sample for DL1-2' TPH analysis was 26%, for ethyl benzene it was 103%, and for total xylenes it was 105%. A RPD above 25% is normally considered inadequate, and therefore, the sample date should be considered estimated due to poor laboratory precision. This phenomenon may be attributable to uneven distribution of petroleum-contamination throughout the soil samples. RPDs between the original samples of samples and the duplicate sample and the duplicate sample date should be considered estimated due to poor laboratory precision. This phenomenon may be attributable to uneven distribution of petroleum-contamination throughout the soil samples. RPDs between the original samples and the duplicate samples and the duplicate samples for Chloride analysis were at a minimum 7% and at a maximum of 21%; the reproducibility for these analyses is considered adequate.

Remedial Option 1 - Removal of Petroleum-Impacted Soil and Placement of Clean Fill

An estimated 5,300 cubic yards of petroleum-impacted soil is present at the Site. This is based on the soil sample analytical results for those soil samples collected in October 2003. This is also based on using a value of 100 mg/Kg total TPH as a site remediation value (based on the NMOCD remediation guidance). It is proposed that all soils containing total TPH above 100



mg/Kg be removed from the Site and be transported to an OCD-approved facility for disposal. An estimated 6,095 cubic yards of clean fill will be needed to be transported to the Site and placed in the areas of soil excavation. The clean fill will be required to be compacted and the Site contoured to the original grade (pre-remedial activities). A map showing the approximate location of the proposed excavated area is included in Attachment K.

Excavation of Petroleum-Impacted Soil - \$18,550 Loading - \$7,950 Transportation, Treatment and Disposal - \$103,350 Backfill, Placement, and Wheel Rolled Compaction - \$22,856 **Total Estimated Cost – Remedial Option 1 - \$152,706**

These costs assume the following:

- A total of 5,300 cubic yards of petroleum-contaminated soil will be removed from the Site. The average depth of all excavations of petroleum-contaminated soil is four feet. Any excavation exceeding this depth will be considered a change in scope.
- All petroleum-contaminated soil removed from the Site is "exempted oilfield impacted soil" and can be disposed of by landfarming at the Rhino Goo Yea South Disposal Facility located eight miles south of Hobbs, New Mexico.
- The excavation area to address the petroleum-contaminated soil at the Site is assumed to be approximately 35,575 square feet. Any additional area excavated will be considered a change in scope.
- Construction testing practices will be implemented during the backfill of the excavation with clean fill to assure that subsidence will not occur. Construction testing costs are not included in the above costs.
- It is assumed that an additional 15% of material will be required in order to backfill the excavated area. An estimated 6,095 cubic yards of clean fill material will be required.
- New Mexico Gross Receipts Tax (NMGRT) is not applied to these costs.

These costs are preliminary only and do not include costs to develop a site-specific work plan and/or conduct excavation contractor oversite. INTERA assumed NMOCD would perform these duties. In addition, other remedial options (soil vapor extraction, treatment in place, etc.) were not considered when developing these costs.



Remedial Option 2 – Excavate Petroleum-Impacted Soils and Construct Compost Piles

An estimated 5,300 cubic yards of petroleum-impacted soil is present at the Site. Originally, INTERA was to generate costs to excavate all contaminated soil at the Site and to construct compost piles at the Site. The City of Lovington, the Site owner, has communicated to the NMOCD Project Manager that the City of Lovington will not permit compost piles to be constructed at the Site. Therefore, this option was not considered and costs were not generated to perform this original Remedial Option as outlined in the NMOCD SOW.

INTERA appreciates the opportunity to work with the New Mexico Oil Conservation Division. If you have any questions please do not hesitate to contact us at (505) 246-1600. Thank you very much.

Sincerely, **INTERA Inc.**

Joseph Tracy, RG Project Manager

Figures:

Figures 1 – Site Location Map Figure 2 – Site Map Figure 3 – Removed Piping Map Figure 4 – Heavy Surface Staining Map Figure 5 – Soil Sample Location Map Figure 6 – Chloride Grid Sample Location Map

Attachments: Attachment A – Site-Specific Health and Safety Plan (HASP) Attachment B – NORM Survey Report Attachment C - Photograph Log Attachment D – Waste Disposal Manifests – Tank Contents - Liquid Attachment E – Waste Disposal Manifests – Tank Contents - Solids Attachment F – Tank (Steel) Receipt Attachment G – Lead-Based Paint Sampling Results (paint samples from Site tanks) Attachment H – Miscellaneous Debris Waste Tickets Attachment I – Laboratory Analytical Results Attachment J – Wellhead Protection Area Map Attachment K – Estimated Area of Petroleum-Contaminated Soil

Stacy Sabol Sector Manager

Figures

Figures



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Attachment A

Attachment A Site-Specific Health and Safety Plan (HASP)

Health and Safety Plan for

Fluid Removal, Tank Decommissioning, Excavation and Soil Sampling Activities at

Araho Inc. Former Injection Well Disposal Facility, Lea County, New Mexico



One Park Square 6501 Americas Parkway NE Suite 820 Albuquerque, New Mexico 87110

October 2003

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Attachment A	Site Personnel Acknowledgement
Attachment B	Site Visitor Log
Attachment C	Hospital Location Map
Attachment D	Air Monitoring Log
Attachment E	Safety Meeting Attendance Form

. 1

Appendices

Appendix AExcavation SafetyAppendix BRespirator Fit Testing InformationAppendix DMaterial Safety Data Sheets (MSDSs)

ARAHO FACILITY SITE SPECIFIC HEALTH AND SAFETY PLAN

This plan applies to the Araho Inc. Former Injection Well Facility, Lea County New Mexico. This Site Specific Health and Safety Plan (SHSP) is a dynamic document and is subject to change during the performance of the scope of work. This SHSP applies to all personnel involved activities performed at the Former Injection Well Facility Site. Site activities under this SHSP include removal of fluid from tanks, removal of tanks, removal of surface and buried piping, Conduct Naturally Occurring Radioactive Materials Survey (NORM), exploratory excavation of soils and soil sampling. A new SHSP must be in place before any activities out of the scope of this SHSP occur. If at any time an employee is not following the guidelines of this SHSP, they may be escorted off the site and further investigation or action will be taken.

Sector Manager: Stacy Sabol – INTERA - Albuquerque (505) 246-1600

Project Manager: Joe Tracy - INTERA Albuquerque 505/246-1600

On-Site Project Manager/Site Health and Safety Officer: Konrad Clark Mobile: 505-239-7978

Health and Safety Officer: Tricia Johnson -- INTERA Albuquerque 505/246-1600

Site Location: Located in the NE quarter of the SE quarter of section 1, township 17 south, range 36 east, Lea County NM

Site Description: The site operated from 1974 to 1993 as an injection well disposal facility

1.0 SCOPE OF WORK

The contaminants of concern at the site are:

Crude Oils, gasoline, diesel fuels, and possibly oils and grease.

The following activities will be performed during site work:

- Removal of the tank fluids, tanks, equipment and piping, trash, and excavation for delineation of contamination
- Conduct NORM Survey
- Soil sampling

ALL EXCAVATION ACTIVITIES SHALL BE PERFORMED ACCORDING TO THE REGULATIONS AND REQUIREMENTS FOUND IN APPENDIX A AND BY OSHA 29 CFR PART 1926.650, SUBPART P (EXCAVATION UNDER THE OSHA CONSTRUCTION STANDARDS).

WORK PROCEDURES:

- Begin working in LEVEL D (standard work clothes, boots, hard hat, safety glasses).
- No smoking, eating or drinking in exclusion zone and contamination reduction zone.

- Wear hearing protection if operating or working near heavy equipment or other source of loud noise (Safety procedures associated with working on or near heavy equipment is included as Appendix C).
- Wear chemical resistant gloves when handling soil samples and/or contaminated soil.
- Monitor soils and breathing zones with the PID or OVM.
- If soils contaminated with oil and/or gasoline at or above the Action Levels in Section 7 are encountered, discontinue work or proceed with MODIFIED LEVEL C protection, as appropriate (Tyvek suit, latex gloves, cartridge respirator, etc.), and monitor the breathing zone as well as soils with the OVM or PID (record air monitoring readings on the Air Monitoring Log included as Attachment D).
- No personnel are to enter the excavation hole unless the walls meet excavation safety requirements.

2.0 SITE HAZARDS

CHEMICAL HAZARDS:

• possibility of gasoline/diesel fuel, crude oil contaminated soil and petroleum hydrocarbon vapors.

SOURCE AND EXPECTED LOCATION OF CHEMICAL CONTAMINATION:

• Above ground storage tanks and associated piping

ROUTES OF EXPOSURE, SYMPTOMS, HEALTH EFFECTS:

- Fuel oils are generally low in toxicity, they have low volatility, and are not readily absorbed through the skin, however they may cause skin irritation, or "dermatitis", upon contact. Waste oils may contain certain cancer-causing components such as heavy metals and oil derivatives which can be absorbed through the skin. Precautions should be taken and gloves should be worn when handling either fuel oils or waste oils.
- Gasoline is considered more toxic than oils, it has relatively high volatility, and certain components are readily absorbed through the skin. Gasoline contains certain components, such as benzene, which are classified as potential carcinogens. Inhalation of vapors and contact with gasoline contaminated soils should be avoided and proper personal protective equipment will be worn to avoid contact with these soils.
- The symptoms of inhalation over-exposure to petroleum products include dizziness, loss of coordination, general malaise, headaches, and nausea. If any of these symptoms occur, the project manager and the nearest hospital should be contacted. The dangers associated with over exposure to petroleum products should be acknowledged and taken seriously.

IMPORTANT NOTE: IF SITE OBSERVATIONS, SAMPLING RESULTS, OR OTHER INFORMATION INDICATES THE PRESENCE OF CHEMICAL CONTAMINANTS OTHER THAN PETROLEUM PRODUCTS, THIS HEALTH & SAFETY PLAN BECOMES VOID, AND A NEW PLAN MUST BE PREPARED AND APPROVED!

PHYSICAL HAZARDS:

- Construction zone and excavation area conditions (slips, trips and falls),
- Heavy equipment traffic,
- Underground utilities,
- Overhead Utilities,

- Biological hazards insect stings and snakes, and
- Adverse weather conditions.

NOISE HAZARDS:

Operation of heavy equipment (drill rig, track hoes, loaders, tandem trucks, etc.).
 Hearing protection is to be worn when working near heavy equipment.

3.0 HEAVY/LIGHT EQUIPMENT

Possible	Personal injury
Hazards	Property damage
	Equipment damage

General

- Ensure operators have demonstrated skills and/or have attended training on the safe operation of heavy/light equipment.
- Operate equipment according to Department of Transportation (DOT) regulations.
- Meet manufacturer's minimum requirements for safe operation of equipment.
- Daily inspect heavy/light equipment before use. Identify defective equipment, remove it from service, and do not use it until repaired.
- Before operating heavy/light equipment, inspect work areas, and provide safeguards for identified hazards.
- Ensure operator's manual is accessible for all heavy/light equipment.
- Before operating heavy/light equipment greater than 20 horsepower with an operator's seat (excluding trucks), ensure it is equipped with approved roll over protection safety (ROPS), if required.
- Ensure heavy/light equipment with an operator's seat and equipped with roll over protection safety (ROPS) is equipped with a seat belt.
- When operating heavy/light equipment, wear a seat belt where provided.
- Before exiting operator's seat from all heavy/light equipment, lower attachments to the ground and apply parking brake.
- When riding on heavy/light equipment, ride only on designated positions.
- Do not use heavy/light equipment as a lifting device unless the equipment and rigging have been load-tested.
- Ensure all equipment operated during poor visibility or inclement weather is equipped with proper lighting and appropriate safety devices (e.g., windshield wipers, defroster).
- If it creates a hazard to persons in the immediate work area, do not operate equipment.
- Operate all heavy/light equipment within manufacturer's recommended operating parameters.
- When digging, drilling, driving objects, or trenching close to energized circuits, locate underground utilities (e.g., electrical lines, telephone, water, natural gas, and other piping systems) and take measures to prevent damage.
- Be careful when using ladders, handrails, steps, etc., to climb on or off heavy/light equipment.
- Chock all vehicles with dual wheels. Chock medium-and heavy-duty vehicles (one ton or greater) and, on extremely hilly and mountainous terrain, chock smaller vehicles (1/2-ton pickups and ³/₄-ton service vehicles).
- Wear footwear appropriate for the environment and for the equipment being used.

Operation of Light Equipment (Mowers, Tractors, Chain Saws, Tamps, Etc.)

- For manual opening of tailgates on dump trucks, install and use handgrips.
- Ensure farm tractors used with bush hogs are equipped with heavy-metal mesh guards for personal protection.
- When engaged in a winching operation with light equipment, be positioned safely (e.g., behind the door).
- When working in the bucket of an aerial lift, wear a fall protection harness.
- When operating a chain saw, wear eye and face protection and, except when working from a bucket truck or wood pole, wear chaps.
- When operating a weedeater with a blade (brushsaw), wear leggings or chaps and eye and face protection.
- When operating a tamp (except for pole tamps), wear foot protection including toe and metatarsal guards.
- Use the following required personal protective equipment:
 - Hard hats
 - Hearing protection
 - Safety glasses
 - Work gloves

Operation of Heavy Equipment (Bulldozers, Motor Graders, Packers, Core Drills, Etc.)

- When engaged in a winching operation, use heavy equipment equipped with heavy-metal mesh guards for protection.
- Ensure all heavy equipment is equipped with back-up alarms and warning devices.
- Ensure all heavy equipment is equipped with a fire extinguisher.
- When clearing wooded areas, use heavy equipment equipped with closed clearing cab.
- Safety glasses and hard hat are not required in the enclosed cab of bulldozers.
- Use the following required personal protective equipment:
 - Hard hats
 - Hearing protection
 - Safety glasses

4.0 MOTOR VEHICLE SAFETY

Possible	Vehicle accidents
Hazards	Personal injury

Operation

- Operate all vehicles according to applicable Department of Transportation (DOT) regulations.
- Do not operate a vehicle until windows are free of dirt, ice, snow, frost, or anything that obstructs clear vision.
- Do not operate a motor vehicle without authorization and a valid state operators license or permit applicable for the type of vehicle operated.
- Before operating a vehicle, visually inspect it to determine whether the vehicle is safe to operate.
- Before operating a vehicle, become familiar with the vehicle's controls.
- When driving a commercial motor vehicle, perform and document a pre-operational and

post-operational inspections according to current DOT regulations.

- When riding in a vehicle, use the provided seats, and wear seat belts.
- Ensure all passengers are secured (e.g., seat belts fastened, doors closed) before moving vehicle.
- While operating a motor vehicle, observe all traffic rules and regulations.
- Before opening doors, observe traffic conditions.
- Do not carry loose items on front floors, front seat, rear window, or dash.
- Do not ride in trailers or other similar equipment being towed.
- Report any defects noted while operating a vehicle. Correct unsafe operating conditions before further use.
- Do not tow mobile equipment without using a approved hitch and safety chains adequate for the load.
- Always remain alert to other vehicle movements.
- During refueling, turn vehicle ignition off, and do not smoke.
- During refueling, attend the gas nozzle.
- When possible, position vehicle to eliminate need to back up.
- When backing is necessary, back slowly, check blind areas and clearances, and seek aid of another when possible.
- Set the parking brake on all parked vehicles.
- If you are involved in an accident while on company business or while operating a company vehicle, immediately notify your supervisor/management. Management shall notify the INTERA Safety Officer.
- Chock all vehicles with dual wheels. Chock medium-and heavy-duty vehicles (one ton or greater) and, on extremely hilly and mountainous terrains, chock smaller vehicles (1/2-ton pickups and ³/₄-ton service vehicles).

Emergencies

- In case of any vehicle trouble (e.g., a flat tire), pull off to the right side of the road, if possible, and use emergency flashers and warning signals.
- In case of an accident:
- Stop the vehicle immediately or as near the accident as practical.
- Put on a traffic vest if one is available.
- Give assistance, and obtain medical aid.
- Call the police, and notify supervisor as soon as possible.
- Exchange names, addresses, and vehicle insurance information.
- Do not discuss who is at fault.
- Get names of any witnesses to the accident.
- Remain at the scene until you are no longer needed.

Truck Operators

• Ensure all required flags (18 x 18 in. minimum), lights, and other warning devices are properly placed on loads and vehicles.

Work Zone Safety

- Follow the Work Zone Safety Program when performing work within or over:
 - The right-of-way of city, county, state, or federal streets and highways.
 - Any street or access road where potential exposure to vehicular traffic exists.
5.0 USE OF TOOLS

Possible	Personal Injury
Hazards	Tool and equipment
	damage

General

- Before they use tools, ensure users are qualified and/or have demonstrated skills.
- Use tools only for their intended purposes.
- Inspect tools before and after each use, and clean them as required.
- Immediately tag and remove defective tools from service, and do not use until they are repaired.
- Do not bypass or disable safety devices on any tools (See Welding/Cutting/Brazing/Grinding" on page 122.)
- Disconnect portable power tools from their energy sources when either the:
- Tools are not in use, left unattended, cleaned, or being serviced.
- Tool components are being changed (e.g., drill bits, saw blades).
- When working inclined, elevated, or grated surfaces, safeguard tools to prevent their falling to a lower level.
- Use appropriate personal protection equipment to avoid the hazards associated with the use of the tool and work materials. (See "Personal Protective Equipment" on page 74.) Note: *Exercise extreme caution to prevent PPE and clothing from getting entangled in rotary equipment, e.g., saws, grinders, etc.*
- Properly secure any work piece so that both hands are free to control the tool.
- Ensure only qualified persons sharpen, adjust, and repair tools.
- Store tools to prevent damage or degradation.
- Make manufacturer instructions available to the user.
- Do not use electrically conductive hoses near energized equipment.

Hand Tools

- Always use a tool designed for the job.
- Ensure all hand files have protective handles.
- Keep impact tools (e.g., drift ping chisels, wedges) properly dressed and free of mushroom heads.
- When one tool is held by an employee and struck by another (e.g., chisels, drills), hold the tool with a suitable holder, not with the hands.
- Ensure wooden handles are free of cracks and splinters and fit tightly in the tool.
- Do not use hand/palms to strike tools.
- Direct cutting edges away from the body.
- Use the following required personal protective equipment:
 - Safety glasses
 - Work gloves

Power-Operated Hand Tools

- Use only electrical power-operated tools that are either:
- Approved double-insulated
- Properly grounded

- Do not use electrical cords to transport, suspend, hoist, or lower tools
- Use the proper tools (e.g., chuck key, wrench) to change components.
- In a flammable or explosive atmosphere, use UL/FM-approved (explosion proof) tools.
- In wet locations, use only tools approved for those locations, or use a GFCI (ground fault circuit interrupter).
- During welding operations, ensure portable electrical equipment does not provide ground paths. Remove or unplug equipment.
- Test portable and plug-connected tools for assured grounding.
- Use only approved attachments (e.g., sockets, grinding wheels, bits) on tools.
- Use the following required personal protective equipment:
 - Safety glasses
 - Work gloves

Pneumatic Power Tools

- Secure tools to the hose or whip by some positive means to prevent accidental disconnection.
- Securely install and maintain safety clips or retainers on pneumatic impact or percussion tools to prevent attachments from being accidentally expelled.
- Do not use supply hoses to hoist or lower tools.
- Ensure all hoses exceeding 1/2 in. inside diameter have either:
- A safety device at the source of supply to reduce pressure
- In case of hose failure, an anti-whipping device and an anti-whipping device at each additional connection
- Do not exceed manufacturer's recommended operating pressure.
- Use only compressed air to operate tools.
- Ensure portable air manifolds (sow bellies) have appropriate safety devices (e.g., outlet cutoffs, relief valves).
- Use only approved attachments (e.g., sockets, grinding wheels, bits) on tools.
- Use only proper tools (e.g., chuck keys, wrench) to change attachments (e.g., sockets, grinding wheels, bits).
- Do not use compressed air to clean persons.
- Before using compressed air to clean equipment, do the following:
- Evaluate for airborne hazards and safeguard against.
- Wear appropriate personal protective equipment.
- Control access to work area.
- Reduce air pressure to <30 PSI.
- Use the following required personal protective equipment.
 - Safety glasses
 - Hearing protection
 - Work gloves

Fuel-Powered Tools

- Before refueling, servicing, or maintenance, stop and cool engine.
- Use tools in well-ventilated areas to eliminate accumulation of toxic or noxious fumes.
- Do not use tools in a flammable or explosive atmosphere.
- Equip engines with spark-arresting mufflers.
- Avoid contact with hot engine components.
- Use the following required personal protective equipment:
 - Safety glasses

- Hearing protection
- Work gloves

Hydraulic Power Tools

- Ensure all components meet or exceed manufacturer's recommended capacities for the job.
- Before and during operation, inspect all hoses and connections for kinks and leakage.
- Keep hands clear of moving components.
- When tool design does not protect the operator, wear a full-face shield to protect from hydraulic failure.
- After the load is raised, immediately crib, block, or otherwise secure it.
- Restrict personnel access to work areas where high-pressure hydraulics are being used.
- Use the following required personal protective equipment:
 - Safety glasses
 - Work gloves

Power-Actuated Tools

- Train operators in the proper use of power-actuated tools
- Do not use tools in a flammable or explosive atmosphere.
- Do not load tools unless preparing them for immediate use.
- Do not leave tools unattended where they would be available to unauthorized persons.
- Do not point loaded/unloaded tools at any person, and keep hands clear of open barrel end.
- Do not drive fasteners into easily penetrated materials unless properly safeguarded.
- Before disposing of misfired cartridges, submerge them in water for 24 hours.
- Use the following required personal protective equipment:
 - Full-face shields
 - Safety glasses
 - Hard hats
 - Hearing protection
 - Gloves

Wood-Working Tools

- Ensure operator controls the saw until the blade comes to a complete stop.
- To keep hands away from the blade, use push blocks on table saws when needed.
- Adjust blade to minimum height required to cut the work piece.
- Use the following required personal protective equipment:
 - Safety glasses
 - Hearing protection
 - Work gloves

Portable Machine/Power Tools

- Do not wear loose clothing and jewelry around operating rotating tools.
- Secure long hair so that it will not become a hazard around rotating tools.
- In case a power failure occurs, use a secondary means to restrain magnetic-based tools.
- Do not service or clean tools while operating them.
- Before relocating, servicing, or cleaning, disconnect rotating tools from the power source.
- Use the following required personal protective equipment.
 - Safety gloves
 - Work gloves (when cleaning metal shavings/cuttings from machining processes).

High Pressure Water Cleaning Devices

- Before leaving the nozzle of pressure washers or hydrolazers unattended, do the following:
- De-energize the machine.
- Relieve all stored energy.
- Always keep two hands on the nozzle where designed to ensure positive control of the nozzle.
- Before operating, safeguard the area to:
- Keep persons out of the danger area.
- During blasting operations, prevent projectiles from endangering or injuring persons.
- Do not use high pressure water cleaning devices on energized, electrical equipment where water spray can contact energized conductors.
- If chemical additives are used during the cleaning process, be aware of all hazards associated with the chemical, and take the necessary precautions to prevent injury to anyone who may contact the chemical.
- Use the following required personal protective equipment:
 - Protective gloves
 - Hard hats
 - Safety glasses
 - Face shields

Special Tools

 Ensure shop-built or modified tools made to fit special applications are designed by a qualified person designated by management.

6.0 TRENCHING/EXCAVATIONS

	Entrapment
Possible	Asphyxiation
Hazards	Poor air quality
	Trauma

General

- Before doing any work, conduct a pre-job safety meeting, and communicate with all parties.
- Before performing any work within the trench or excavation deeper than 5 ft., ensure a competent person has inspected the trench.
- Ensure a competent person:
- Makes daily inspections
- Inspects after significant events such as rainstorms
- Specifies use of sharing, shield, or sloping.
- To keep soil piles from falling into the trench, clear edges of excavations back to at least 2 ft.
- Ensure underground utilities are identified and measures are taken to prevent possible damage.
- For trenches less than 5 ft. deep, ensure a competent person assures no potential injury from cave-in exists.
- Barricade open, unattended excavations. Warning tape alone may be used only temporarily until adequate physical protection is installed.
- If an excavation is 6 feet or more deep and cannot be readily seen because of plant growth

or other visual barrier, protect employees near the edge from falling by using guardrails, barricades, or covers.

Definition

Competent person – A person who:

- Is capable of identifying existing and predictable unsanitary or hazardous conditions in the work environment
- Is authorized to initiate the corrective measures to eliminate hazards
- Has been trained in the correct trenching applications and rules and whose training has been documented.

7.0 WELDING/CUTTING/BRAZING/GRINDING

	Electrical shock	٦
	Burns	
Possible	Radiant burns	
Hazards	Fires	
	Physical illness	

General

- Before performing welding, cutting, or grinding, evaluate and safeguard the work area for combustible items.
- Assign a fire watch with a suitable fire extinguisher to welding, cutting, and grinding operations in work areas with combustible materials or where fire or sparks cannot be contained in the immediate work area.
- When using a fire watch, maintain it for 30 minutes after the work is complete.
- When welding, cutting, or grinding in elevated areas, cover the grating as much as possible and post a fire watch below as needed.
- Before applying heat, thoroughly clean, decontaminate, and/or purge machinery, tanks, drums, etc. that could contain explosives or combustible/flammable materials.
- Use welding screens whenever other persons could be exposed to welding, cutting, or grinding operations.
- Keep welding, cutting, and grinding areas clean and free from accumulations of trash, rags, and other combustible items.
- For all hot-work processes in congested areas, (e.g., boilers, preheaters, feed-water heaters, moisture-separator reheaters) wear clothing appropriate for welding.
- When extreme conditions exist, wear leather sleeves, aprons, and welding coats.
- Note: Clothing that is **not** appropriate for welding includes:
 - Synthetics such as nylon, polyester, acetate, and rayon
 - Blends of these synthetics such as polyester/cotton
 - Flame-resistant clothing intended for electrical work (including light weight Nomex and PBI-Kevlar
- While performing any hot-work operation, dress appropriately to protect exposed skin from sparks, radiant heat, and hot surfaces.
- When performing welding/cutting operations, eliminate the possibility of sparks being caught in cuffed pants.
- When welding on a crane or suspended load, establish an independent ground.
- Where air contaminants exceed permissible exposure limits, use proper

ventilation/respiratory protection.

• For stationary manifold systems, follow manufacturer system design criteria.

Grinding

- Inspect grinders before use to ensure the grinder is in good repair and all safety guard devices are properly attached.
- Ensure guards on 90-degree grinders are between the user and the wheel.
- Before operating a grinder, ensure guards are in place unless you are guarded from the wheel by the work object.
- Before installing a grinding wheel, check the grinder to ensure the spindle speed does not exceed the maximum operating speed indicated on the wheel.
- Before changing wheels or rocks, disconnect grinders from energy source.
- Keep hand-held grinders in control until the wheel or rock comes to a complete stop.
- Operate and control grinders according to manufacturer's recommendations (1 hand-2 handoperations).
- Do not make adjustments to tool rests while the wheel is in motion.
- Where tool rests are required, adjust them to a maximum of 1/8 in. from the wheel. Ensure the distance between the wheel periphery and the adjustable tongue on the end of the peripheral member at the top never exceeds 1/4 in.
- Before installing wheels on stationary grinders, ring-test them to ensure integrity.
- On pedestal or bench grinders, ensure wheel or rock comes to a complete stop before you leave the area.
- Use the following required personal protective equipment:
 - Gloves (except when grinding tooling bits too small to be handled with gloves)
 - Full-face shields
 - Hearing protection
 - Safety glasses

Note: Wear monogoggles if the severity of the tasks requires additional protection to ensure against eye injury. See "Personal Protective Equipment" on page 74.

Arc and Tig Welding

- Inspect electrical welding equipment before and after each use. Immediately remove defective electrical welding equipment from service, identify it, and do not use it until repaired.
- Use manufacturer's approved methods to repair damaged welding cables.
- Do not use cables with splices within 10 ft. of the electrode holder.
- When electrode holders are not in use, place them so that they cannot make electrical contact with persons or conducting objects.
- When filler wire is not in use, remove it from the electrode holder.
- When tungsten is not in use, push it inside the cup, or remove it.
- Dispose of all used filler material in a designated container.
- When tig welding in a confined or congested area, wear clothing appropriate for welding.
- When arc welding in an overhead position or in a confined area, wear clothing appropriate for welding.
- When air arcing, wear hearing protection and clothing appropriate for welding.
- Note: Clothing that is **not** appropriate for welding includes:
- Synthetics such as nylon, polyester, acetate, and rayon
- Blends of these synthetics such as polyester/cotton

- Flame-resistant clothing intended for electrical work (including light weight Nomex and PBI-Kevlar).
- When ventilation does not reduce airborne contaminants below the permissible exposure limits, wear respiratory protection.
- Wear welding gloves in all welding operations.
- Wear full-face welding hoods. (Other shields may be used if the work cannot be performed with a full-face hood.)
- When in a confined space or area, ventilate space as needed to maintain a safe atmosphere.
- Note: Welding in a confined space involving the following metals require mechanical ventilation: zinc-bearing base or filler metals, zinc-coated metals, lead base metals, cadmium-bearing filler materials, chromium-bearing metals or metals coated with chromium-bearing materials.
- Welding in a confined space involving the following metals require local exhaust ventilation: metals containing lead, other than as an impurity, metals coated with lead-bearing materials, cadmium-bearing metals, cadmium-coated base metals, metals coated with mercury-bearing materials, beryllium-containing base or filler metals. <u>An airline respirator shall also be used</u> when welding on metal involving beryllium.
- Use the following required personal protective equipment:
 - Welding gloves
 - Safety glasses
 - Approved welding shields

Oxy/Acetylene Safety

- Inspect oxy/acetylene equipment before use. Immediately remove defective equipment from service, identify it and do not use it until repaired.
- Do not permit oil or grease to come in contact with regulators, fittings, valves, gauges, and the torch assembly.
- Ensure the pressure of the oxygen and the acetylene does not exceed manufacturer's recommendation for the particular cutting or brazing operation being performed.
- When opening the valves on a regulator, always stand to one side and away from the valve opening.
- Before installing a regulator, crack the valve to remove any dirt or trash that could damage the regulator.
- When installing regulators, use the proper tool and do not over-tighten connections.
- Before opening the cylinder valve, back out the regulator handle. Then slowly adjust the regulator pressure.
- Before removing a regulator, close the cylinder valve and release all gas from the hose and regulator.
- When oxy/acetylene equipment is not in use, close cylinder valves and release the pressure in the hose.
- Always open the oxygen cylinder valve slowly, allowing it to backseat.
- Do not use acetylene at pressure exceeding 15 psig (pounds per square inch gauge).
- Always use and store acetylene cylinders in an upright position.
- Use a friction or stationary striker to light a torch. Do not light torches with matches, cigarette lighters, or hot work.
- To protect against flashback, ensure all oxy/acetylene equipment is equipped with flashback arresters at the regulator outlet and at the torch for both gases.
- Remove gauges and replace caps on oxy/acetylene cylinders when they are not in use if the

valve may be damaged by being bumped or knocked over.

- Ensure valve handles and/or wrenches are in place and use.
- When ventilation does not reduce airborne contaminants below the permissible exposure limits, wear respiratory protection.
- Use the following required personal protective equipment.
- Burning goggles
- Welding gloves

Compressed Gas Safety

- Securely store compressed gas cylinders upright with the valve caps in place. Use substantial means suitable for the conditions. (Tape, string, cord, or ribbons are not acceptable for securing.)
- When using compressed gas cylinders, keep them far enough away from actual welding or cutting operations to prevent hog slag or flames from reaching them.
- Do not store oxygen cylinders within 20 ft. of acetylene cylinders unless they are separated by a ½-hour fire-resistant barrier 5 ft. high.
- Tag empty cylinders EMPTY, and keep valves closed and protective caps in place.
- Before lifting or moving cylinders, ensure valve protection caps are in place.
- Note: Cylinders secured in carts may be moved short distances over level surfaces without removing the regulator and adding valve protection caps.

8.0 SITE PERSONNEL REQUIREMENTS

HEALTH & SAFETY TRAINING: Site personnel must have had 40 hour OSHA 1910.120 HAZWOPER training and experience which included coverage of hazard recognition, use of site monitoring instruments, use of personal protective equipment, etc. Proof of this training shall be submitted to the Site Project Manager or Site Safety Officer before commencement of work. If the donning of a respirator is necessary, proof of participation in a medical monitoring program shall be submitted to the on-site safety officer.

9.0 SITE HEALTH & SAFETY PROCEDURES

Prior to beginning on-site field work the following will occur:

- All personnel (INTERA and any associated subcontractors) will review INTERA's Site Health and Safety Plan (SHSP) and sign a consent form (included as Attachment A) stating the plan has been read and understood.
- All training certification and documentation of personnel will be submitted to the Site Manager.

Upon arrival at the site:

- General site orientation and walk-over.
- Locate ONE-CALL identification of underground utilities.
- ONE-CALL NOTIFICATION: Location of power, gas, phone, and cable lines will be verified with the individual utility departments.
- Site work zones and control measures will be discussed and identified if necessary (exclusion zone, contamination reduction zone, support zone, and location of emergency equipment),

- Establish a command center, and
- A Site Health and Safety meeting will be held to answer any questions concerning the SHSP. (A Safety Meeting Attendance Form, included as Attachment E, will be filled out during the meeting)
- All personnel will be informed of the locations of the following safety items: first-aid equipment, mobile phone, map to the hospital, copies of the SHSP, eye wash station, drinking water source, and Material Safety Data Sheets (MSDS) for any chemicals brought on site for use in operations. The referenced safety items will be available to all personnel while working on site.
- Review emergency procedures and the location of the hospital map.
- Discuss location and use of nearest phone(s).
- Determine soil type (for slope requirements in excavation area).

Daily activities:

- A health and safety meeting will be held at the beginning of each day during which all personnel will sign a meeting form (included as Attachment E) acknowledging attendance and understanding of topics discussed.
- Breathing zone monitoring with organic vapor meter (OVM) and recording of those readings on the air Monitoring Log (Attachment D).

10.0 HAZARD COMMUNICATION PLAN (HAZCOM)

	Burns
	Spills
Possible	Respiratory
Hazards	Explosion
	Poison
	1 013011
	Combustible
	Trauma
	Acute/chronic illness

General Statement

 Guidance given for hazardous chemicals/substances and atmospheric hazards is based on good industrial hygiene practices. Consult specific work procedures, Material Data Safety Sheets (MSDS), labels, and/or safety and IH professionals. In each case, individuals and supervisors ensure hazards are eliminated if possible and at a minimum safeguarded.

MSDSs are located in Appendix D.

General

- Before starting work, identify **ALL** hazardous substances involved with the work task. (Hazardous substances can be chemicals involved in the work process, materials used, or coatings and insulation to be installed or removed.)
- Observe the following work practices where hazardous substances (materials and chemicals) are present:
- Do not eat or drink; do not use tobacco products.
- Wash hands and face at breaks. (When appropriate, shower at the end of work task or shift.)
- Never blow on or shake off contaminated clothing, and never use compressed air to clean it.

- Using approved methods to reduce/eliminate the spread of contamination, clean contaminated work area.
- To prevent unnecessary personnel exposure, mark off the work area as necessary with ribbons, tapes, signs, or barriers.
- When a splash hazard exists, verify availability and location of eye-wash water, and shower before performing tasks.
- When working with hazardous materials/chemicals, be able to perform the following in an emergency situation.
- Identify an emergency situation.
- Know how and when to report the chemical emergency.
- Know local places of refuge/how to evacuate the area.
- Know appropriate decontamination procedures.
- Conduct atmospheric monitoring as necessary to ensure a safe work environment.
- Where hazardous chemicals/materials are used, stored, or disposed of in the work place, use engineering controls (e.g., natural, forced, or local exhaust ventilation) to eliminate or reduce airborne concentrations of hazardous substances.
- Ensure respiratory protection equipment and personal protective equipment (including clothing) are specified by work procedures or trained and qualified persons based on an evaluation of the hazard and the exposure levels.

Hazard Communication

- Ensure individuals are trained and have demonstrated appropriate knowledge of:
- Key elements of the Hazard Communication Program.
- Specific hazards of substances (e.g., chemicals/materials) to which individuals may be exposed.
- Before using hazardous substances be aware of the following:
- Exposure effects
- Physical hazards (e.g., flammable, explosives)
- Health hazards
- Routes of entry
- Emergency procedures (e.g., first aid, spills, releases)
- Personal protective equipment requirements
- Use only materials/chemicals that are appropriately labeled, and follow the label instructions for chemical use and storage.
- Ensure individuals know how and where to obtain MSDS.
- Use (e.g., handle/transport/store/dispose of) hazardous substances according to Material Safety Data Sheets or specific work practices.
- If a real or suspected exposure to hazardous substances exists:
- Evacuate and isolate area.
- Notify appropriate location personnel.

Definitions:

- Hazardous material—Any substance (e.g., material/chemical) with a health or physical hazard
- Exposure—To submit or subject an individual to a hazardous substance (e.g., material/chemical) through inhaling, ingesting, injecting, skin contact, or absorption. The occurrence may be suspected or confirmed.

Exposure to Lead

- Some work tasks including, but not limited to, the following may increase lead exposure above acceptable limits:
- Scraping, painting, or cleaning surfaces with lead coating
- Welding, cutting, or abrasive blasting of lead-containing metals or materials and/or coatings.
- Contact your supervisor or location Safety/Industrial Hygiene professional to determine whether tasks you perform cause lead exposure to exceed acceptable limits.
- Note: Certain regulatory standards have specific training requirements beyond Hazard Communication. Consult with your SST representative or Safety and Industrial Hygiene.

Refrigerant Safety

- Note: Work with refrigerants only if you have the appropriate EPA certifications.
- Observe the safe work practices below when working with refrigerants.
- Use safety glasses and protective gloves.
- Avoid inhaling refrigerant vapors.
- Ensure adequate ventilation in the area and forced ventilation at the service location to disperse all remaining refrigerant vapors.
- Do not use oxygen or compressed air to pressurize appliances to check for leaks.
- Use only nitrogen when purging equipment to remove remaining refrigerant and lubricant.
- Always use a pressure regulator when charging a system with nitrogen.
- Do not light torches or use open flames in areas where refrigerant vapors are present.
- Refer to the Material Safety Data Sheet and equipment manufacturer's recommendations for detailed information.
- Know the proper operating and limits of refrigerant recovery machines.
- Ensure refrigerant charging lines/hoses are constructed of materials compatible with refrigerant used.
- Store containers in a cool place away from direct sunlight and other heat sources and weather conditions.
- Avoid placing containers in positions where falling could cause ruptures.
- Close container valve and replace outlet with cap and gasket when not in use.
- Do not reuse disposable containers for any purpose.
- To prevent rupture, ensure that when charging, refrigerant containers are not connected to any system of higher pressure to prevent backflow and overfilling.
- Do not use direct heating (e.g., flames, radiant heaters) to increase the rate of discharge of refrigerant from a container. Use only approved methods such as controlled blanket heaters.
- Do not overfill storage containers. Leave room for expansion.
- Do not mix refrigerants. Put in only containers marked for that particular refrigerant.
- Transfer/store refrigerant only in a container structurally suitable for that refrigerant.
- Before transferring a refrigerant, inspect container for corrosion or damage that may weaken it.
- Never leave refrigerant cylinders exposed to direct sunlight.
- Recover liquid trapped in tank liquid line used with recovery unit to prevent rupture of line and to prevent injuries from accidental liquid release.

11.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

MODIFIED LEVEL D: hard hat, work boots, long sleeves, and long pants will be required at all times. Gloves are required any time direct contact with contaminated soils is expected. Hearing protection is required for equipment operators and anyone working near heavy equipment.

CONTINGENCY LEVEL OF PROTECTION: All site personnel shall be prepared for MODIFIED LEVEL C which includes MODIFIED LEVEL D PPE plus a cartridge respirator (with cartridges intended for work with volatiles). Personnel will go to MODIFIED LEVEL C when the action levels in section VII are detected with a PID/OVM. To fulfill this requirement, respirator training and fit testing should have been completed by personnel before work commences. In the instance that a respirator is required to be worn, in addition to the prior fit testing, on-site daily fit testing will be performed on personnel and recorded in the log book. Appendix B outlines the requirements for the fit testing of a respirator. Each employee shall have his/her own respirator to ensure proper fit. Proof of prior respirator training and fit testing should be submitted to the site project manager.

PPE AND EQUIPMENT DECONTAMINATION:

- Remove gross contamination from tools, respirator, monitoring equipment, boots, etc. prior to leaving the work-site, using Alconox/water solution,
- Either completely decontaminate soiled equipment at the work-site using detergent & water (if possible), or wrap equipment in plastic bag for transport until complete decontamination is possible,
- Dispose of contaminated gloves, Tyvek suits, used cartridges, paper towels, etc. by placing in a plastic bag and discarding in a designated waste container for the site, and
- Wash hands and face thoroughly with soap and water before lunch or coffee breaks, and after finishing work for the day.

12.0 MONITORING EQUIPMENT

The following specifications for air monitoring will be followed during all field activities including:

- vapor sampling activities,
- trenching,
- excavation

ORGANIC VAPOR METER (OVM):

The OVM meter will be used to monitor the breathing zones of personnel, the soils, and the contamination reduction zone for volatiles. These measurements will be recorded in the field logbook or on the Air Monitoring Log included as Attachment D.

ACTION LEVELS:

- 1. Organic Vapor Meter (OVM)- breathing zone readings:
 - 0 to 25 parts per million (ppm) remain in MODIFIED LEVEL D.
 - Greater than 25 ppm and less than 100 ppm discontinue work until personnel working in exposure areas are prepared in MODIFIED LEVEL C PPE.
 - At levels consistently above 100 ppm in the breathing zone, discontinue work and wait for notification to either proceed or evacuate site. (Site Project Manager shall notify the Corporate Health and Safety Officer of OVM readings of more than 100 ppm).
- 2. Detection through senses -

If soils contaminated with oil and/or gasoline are detected with visual or olfactory senses by an employee, personnel shall move upwind of the odor and inform the Site Project Manager of the location of the odor.

13.0 CONFINED SPACES

Confined spaces are not anticipated on-site. If a confined space is encountered, a sign stating that "Entry is Prohibited" will be posted and the Project Manager and Health and Safety Officer will be notified. No one shall enter a confined space without the proper training and documentation needed to perform confined space work activities. If the excavation area is not sloped for entry and exit, personnel shall consider the excavation area a confined space and shall NOT enter the area.

14.0 SITE CONTROL

All site visitors will sign in on a SITE VISITOR LOG (included as Attachment B). Site visitors are allowed in the support zone and command center only. Material suppliers will have a designated area for delivery of material. Exclusion zones will be marked off with CAUTION tape. Excavation areas will be designated and entered into by authorized personnel only. No visitors shall enter the exclusion zone or excavation area without prior approval of the site project manager. A sign reading "Authorized Personnel Only" shall be posted at the entry area of the site during work and off-work hours. Entry and exit to the site area will be controlled during work and off-work hours.

15.0 TRANSPORTATION OF SITE MATERIALS

Waste and contaminated site materials shall be disposed of and transported in the proper manner and shall not be transported by site personnel.

16.0 EMERGENCY CONTACTS/PROCEDURES:

EMERGENCY PHONE NUMBERS: AMBULANCE: 911 FIRE: 911 POLICE: 911 HOSPITAL: Lea Regional Medical Center 5419 N Lovington Hwy, Hobbs NM (map to hospital included as Attachment C)

Hospital Phone Number: 492-5000

LOCATION OF NEAREST PHONE: (on-Site) INTERA cellular phone 505/239-7987 INTERA Office in Albuquerque 505/246-1600 INTERA Health and Safety Officer - Tricia Johnson 505/246-1600

Any incident or accident must be reported to the Project Manager and the Health and Safety Officer immediately.

PERSONAL INJURY - Administer appropriate first aid. If injury is serious, transport the victim to the nearest hospital. If possible, notify hospital in advance of incoming patient and nature of injury. If there is a question about whether it is safe to move the victim, DO NOT move the victim; instead, make him/her as comfortable as possible, and summon emergency assistance. CHEMICAL EXPOSURE - If site personnel show signs of inhalation exposure, retreat to fresh air for recovery. If symptoms are serious, such as nausea or fainting, bring the victim to the nearest hospital for observation, and discontinue work at that location until further notice.

In case of skin or eye irritation due to chemical contact, wash affected skin with soap and water, or flush eyes with generous amounts of water. Seek medical attention if deemed necessary.

FIRE - If fire occurs, the fire department shall be notified immediately. If the fire can be easily contained and extinguished, do so with fire extinguisher. If explosion risk is present, evacuate all personnel to a safe area and call fire department.

EMERGENCY SITUATIONS: If an emergency exists, notify local emergency facilities immediately.

IMPORTANT:

IF SITE PERSONNEL SHOW SIGNS AND SYMPTOMS OF CHEMICAL EXPOSURE, DISCONTINUE WORK AND FOLLOW APPROPRIATE EMERGENCY PROCEDURES!

IF SITE OBSERVATIONS, ODORS, OR ANY OTHER INFORMATION INDICATES THAT CONTAMINANTS OTHER THAN PETROLEUM PRODUCTS ARE PRESENT, STOP WORK, AND DISCONTINUE WORK UNTIL FURTHER NOTICE.

ATTACHMENT A SITE PERSONNEL ACKNOWLEDGMENT

By signing the following I acknowledge that I have read, understood, and agree to comply with the provided site specific Health and Safety Plan.

Printed Name	Signature	Date
Justin Roberts	Lythi	10/15/03
Mike Jennings	Makan	10-15-03
SERGIOGARIA	Quilline	10/15/03
here Contentes	Ser Com	10-15-03
Dusty Aunkin	Turk phi	10-15-03
brinn Ellas	BELLAS	10-15=03
Luis Bennena	Luns Handa	10-15-03
Martine Kicling	That the second	10-15-03
Genny Rivers	a de	10-15-03
Paul Sheeley	Mallun	10-15-03
LARTY JOHNSON <	Delson	10-15-03
Silvin Cent	Silvis mat	10-17-03
Pedro Inanco	Poder France	10-17-03
PATPICK MCMAHON	PAHB M'Mdm	10-17-03

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I.

ATTACHMENT B SITE VISITOR LOG

Date T	ime In/Out	Name Organization	Purpose of Visit
10.22-03	2:70 0-1	PATMYMAHON City	View
10-22-63	2:30 p2	Chake Jackson City	Vieu
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Health and Safety Plan for Activities at Araho Facility

ATTACHMENT C MAP TO HOSPITAL

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Send To Printer Back to Map

5419 N Lovington Hwy Hobbs NM 88240-9100 US

Notes:



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ATTACHMENT D AIR MONITORING LOG

Date	Time	Reading (ppm)	Location and Comments	Calibration Date and Time	Initials
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		······································		-	

ATTACHMENT E SAFETY MEETING ATTENDANCE FORM

DATE:	PROJECT	NO.:
PROJECT TITLE:		
PROJECT TASK:		
SAFETY TOPICS PRESENTED: Protective Clothing/Equipment Emergency Procedures Chemical Hazards Location of Nearest Hospital Physical Hazards Location of Mobile Phone Special Equipment Other		
ATTENDEES: NAME (PRINTED)		SIGNATURE
, 		
Meeting Conducted by:		
Name Printed		Signature

APPENDIX A EXCAVATION SAFETY

Trenching/Excavations Category

	Trenching/Excavations							
Intent Prevent injury when working in or around any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal.								
Applicability	Employees and suppliers who dig or work in trenches							
Hazards	 Entrapment Asphyxiation Poor air quality Trauma 							
Subcategory	General Safe Work Practices							

General Safe Work Practices

1. Before doing any work, conduct a pre-job safety meeting, and communicate with all parties.

Note: In Power Generation, refer to the trench permit.

- 2. Before performing any work within the trench or excavation deeper than 5 ft., ensure a competent person has inspected the trench.
- 3. Ensure a competent person:
 - Makes daily inspections
 - Inspects after significant events such as rainstorms
 - Specifies use of shoring, shielding, or sloping
- 4. To keep soil piles from falling into the trench, clear edges of excavations back to at least 2 ft.
- 5. Ensure underground utilities are identified and measures are taken to prevent possible damage.
- 6. For trenches less than 5 ft. deep, ensure a competent person assures no potential injury from cave-in exists.
- 7. Barricade open excavations.

Definition: Competent person – A person who:

- Is capable of identifying existing and predictable unsanitary or hazardous conditions in the work environment
- · Is authorized to initiate the corrective measures to eliminate hazards
- Has been trained in the correct trenching applications and rules and whose training has been documented

Note: Follow Duke Power Trenching Guidelines.

Subpart P-Excavations

Subject P-Excavations

119 36.550 Scope, application, and definitions applicable 10 and

JUDGACE

(a) Scope and application. This industry (a) where we approached this scout typics to all of in an available made in the splites to all of in available are defined to atths surface. Encavathers are defined to include trenemes.

(b) Definitions applicable to this sub-

Accepted engineering practices means part. dest requirements which its compatible the requirements of practice required by a registered professional engineer.

Aluminum Hydraulie Shoring means a neuninered shoring system contracted a slaminum bydraulie cylinders (crossirat es) mention compaction with vertical rails (uprights) or hurizontal rails (wales) Such information in the state of the the necessity of an exclosion and bleach cave-las.

Bell bottom pier hole means a type of shall or bottom excitation, the bottom of which is made far ser than the cross section ation is more as set that to above to form a bellint shape.

Benching (Benching system) means a method of protecting employees from cave-ins by excavating the sides of an excavation In by excerning the antes of threading by the set of th to torm one or a series or surround to read or active to a series of active the series of the series unlaces between levels.

Cate-in means the separation of a mass d rate rock material from the side of all a sat or toos marchar from the sate in sat areavaluat, or the loss of soil from under a excavation, or the ioss of soft from chairs a tenth shield or support system, and its when movement into the excavation, and the op follong of shines, in sufficient space thy so that it could entrop, bury, or other decomposition of the states of the states. where and country in a person

Competent percent means one who is ca-Comparent period means one who is Ca-path of identifying ensing and predict-tole hazards in the surroun three or maning conditions which are unsultary hardous or dangerous to end over the horizon or dangerous to end over the algebras authorization to take product corrective measures to chiminate them.

Gross braces mean the borlasmial memkets of a shoring system installed tertain bestar to the piles of the excavation, the stude of which loar against entire again, and w weics.

Excusation means any man-mailer cut, tavity, trench, or depression in an earth whate, formed by partn removal.

Faces or sides means the vertical or in clined earth surfaces formed as a result of STERAR MOLET

Failure means the breakage, displacement, or permanent deformation of a struc-tural member or connection 50 as to reduce its intractural integrity and its supportive Capabilities.

Hazardous atmosphere means an atmos tracardous atmosphore means at atmosphere phere which by reason of leng extinsive, flammable, paisonaus, corroster, paintains, futuring, oxygen deficient, toxic, or other-tics beneficient. the harmfol, may cause death, threes, of winty.

Kickon means the accidental release or failure of a cross brace.

Protective system means a method of Molecting employees from cave-ins, from an material that could fall or roll from an article treavation face or into an excavation, or

from the solution of a point and the so Protective systems of a straight of a straight showing and benchmark assisted as straights terms and other spreads that provide neuronary projects as

Ramp means an incluted salaring of NUMP means an occurrence automation working influence that is as to be a capture to one grant from story of the story of the structed from such of the story of the SECULAR CONTRACTOR CON

Registered Protessonal Engineer means Registeres (rolesse tag negater means a torset with is registered as a to freshed engineer in the state where the a registeres arrormed. However, a professional engine ners, registered in a registeres in an engine ners, registered in any state a community for en constant an and and an arrained a megisteren professionen et soule sources the meaning of the standard some spiror ing designs for meantischer of needer systems of metodate data is to used in interstate commerce

Sheeting means the members if a shoring system that retain the carton of a short and in turn are supported by after contacts of

the shoring system. Shield (Shield system) means a structure that is after to writeraute to a resource of the second se on it us a cavent are managed in these and ployees within the structure Should rate. buyees within the structure discussion at a terminent structures of carlos, respect to be portable and moved along as well of fresses. Additionally, smith car is either premanticatured of forbuilt in sciencia, each time of the science to exclude each premanutaceares ar constant or reaction and with § 1920.032(c)(3) or reaction 2007 in transition are galatly returned to 15 received to 250 or transition and in.

Shoring (Shoring system) mains a struc-ture such as a metal hydraune, demanical or finiter shoring system that sciences the while of an excavation and when is designed to recommission

to prevent coverina.

Sides See "Faces"

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Securital ramp means a party built of net. steel of weak, usually used for remire ac-cess. Ramps made of sub of the are not

considered structural railies. Support system means a structure such

Support System means a security and the suffer as indergramme, fractisk, of the soft, which provides support to an autor of stracture, untergrammed metabolism, of the tides of an

excavation. Tabulateel data means takes and charts approved by a refraction professional and next and used to describe and lastration protective system.

Trench (Trench extavation) means a nar-Concernential and a second second a marnucle below the seriace of the ground. In where we do not a second of the scheme the second the week of a second s

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Trend loss file remeld.

Trench saleld, See "Smeld."

Uprights means the vertical members of Consists means the sectors memory of a trench shorts system placed in contact with the earth and usually positioned so that introduce memory do not contact each other. Constitution of the transition of memory contact, page memory in event the meters are presented with a meter al memory in lossy spaced, in curtact with or interformation to each other, are uiten Called "sterning

White means nuticontal members of a where insure including memory of a shoring system pared marginelistic to the system values face where this bear against the vertical memorie in the shoring system or work. eatth

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requirements.

(a) Surface metimbrances. All surface encampraters inter are located so as to cre-ate a nazard to some overs shall be removed or supported, as necessary, to safeguard only

(1) Underground installations, (1) The devers. (1) Gitterground installations, (1) the estimated assists at guilty installations, with as rewrite test inner (ind), decities water inner, or any other underground in-stallations installations with may be expected in the environment satisfie excertation work, that for testernic weithout to investor an stral to reterm of first to sponting an

(3) Unitive companies or geners shall be excanation. collected within all-basited or customary local respirate times, advised of the pre-Add response tonics, advised of the pre-based works and cases to establish the loca-tion of the utility of actual excerning. Which the definition of actual excerning which the definition of a works cannot response to a rescale of locate underground endowed to the excerning of works (unless a longer ball of a rescale of the state or locat and these results) is to the ender location of these results of endowed into equipment of which and the end balance of with aution, and the end balance of with autions and the end balance of with autions and the end balance of the end of which acception of the ender locate unity matched acception of means to locate unity institutions and cases.

أرتصب تارف وتصلعا المالعا (3) A representation obstations appliance the estimated section of understound instatistics, the second section of the instal-tation's call be alternined by sale and

acceptable means. (a) While the excavation is open, underen mille die staavation is open, under around millen na mat be protected sup-parted of rom word as necessary to salegeard employees

(c) Access and egross. (1) Structural names to Structural ramps that are used soleto to other the state of access of erros tran excertans shell be designed by a competent teram. Structural comparison with the access of caress of equipment shall to descend to a unificient person mali-flet in structure, testen, and shall be constructure in accur and with the design.

(ii) Ramps and runways constructed of two or more structural members shall have the structural mentions connected together to prevent displacement.

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(iii) Structural members used for ramps and runways shall be of uniform thickness.

(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(2) Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(d) Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(c) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded diven the vehicles are equipped, in accordance with § 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

(f) Warning system for mobile equipment. When mobile equipment is operated adjacent to an extravation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g) Hazardous atmospheres. (1) Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926:50-1926:107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavation.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

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(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) Emergency rescue equipment. (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

(h) Protection from hazards associated with water accumulation. (1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removat to control the level of accumulating water, or use of a safety harness and lifeline.

(2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runuif from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)2) of this section.

(i) Stability of adjacent structures. (1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(2) Excavation below the level of the base or fouring of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(ii) The excavation is in stable rock; or

(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or (iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(3) Sidewalks, pavements and appurte, nant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(j) Protection of employees from loose rock or soil. (1) Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.6) m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k) Inspections. (1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmuspheres, or other hazardous conduitions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(1) Fall protection. (1) Walkways shall be provided where employees or equipment are required or permitted to cross over extavations. Guardrails which comply with § 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

(2) Adequate barrier physical protection shall be provided at all remutely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and other similar operations, temporary wells, pits, shafts, etc., shall be backfilled.

§ 1926.652 Requirements for protective systems.

(a) Protection of employees in excavations. (1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when: (i) Excavations are made e ble rock; or

(ii) Excavations are less that m) in depth and examination by a competent person proviction of a potential cave-in.

(2) Protective systems shall pacity to resist without fail that are intended or could r expected to be applied or trans system.

(b) Design of sloping ai pysems. The slopes and cont sloping and benching systems leeted and constructed by the bis designee and shall be in acc the requirements of paragraph the alternative, paragraph (bX alternative, paragraph (bX); ternative, paragraph (bX4), as

(1) Option (1)—Allowable c: and slopes. (i) Excavations sh. at an angle not steeper than a ball horizontal to one vertical messured from the horizontal employer uses one of the other a below.

(ii) Slopes specified in paragr of this section, shall be excave configurations that are in accuthe slopes shown for Type C sudix B to this subpart.

(2) Option (2)—Determinat. and configurations using Apper B. Maximum allowable slopes, ble configurations for sloping a systems, shall be determined in with the conditions and requi forth in appendices A and B to t

(3) Option (3)—Designs i tubulated data. (i) Designs of benching systems shall be select in accordance with tabulated d. ubles and charts.

(ii) The tabulated data shall t form and shall include all of the

(A) Identification of the para affect the selection of a sloping system drawn from such data;

(B) Identification of the limithe data, to include the magnitufiguration of slopes determined to

(C) Explanatory information necessary to aid the user in ma rect selection of a protective sy the data.

(iii) At least one copy of the data which identifies the regist sional engineer who approved thall be maintained at the job construction of the protective sy that time the data may be sto jobsite, but a copy of the data shi available to the Secretary upon re-

(4) Option (4)—Design by a professional engineer. (i) Sloping ing systems not utilizing Option tion (2) or Option (3) under par of this section shall be approved lered professional engineer.

(ii) Designs shall be in writter shall include at least the following

(A) The magnitude of the s were determined to be safe for the her project:

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dessional engineer ation that such istae a hacard ta 72

avenueuts and anjource. Gr undermined in. another method of protect employees ise of such struc-

of employees from ices ate protection shall mpiley res from love pose a hazard by in excavation face all consist of scaling to rital, installation of protervals as nucessary loctain failing mate provide equivalent

shall be protected from cruis of equipment d by failing or roll-Protection shaft 5. and keeping such ment at least 2 feet (6 of excavations, or by the es that are sufficient or equipment from Acavations, or by a eccasary.

3. (1) Daily inspections of djacent areas, and proteclude by a combenent situation that could esna, indications of stems, hazardous ator hazardous conditions, ad the conducted by the Sector start of work game space laspes faithe shift hayee haiter every ran-reard indiceasing it matheutions are only reoyee explanate can be rea

inerial return finds that could result in a acous of tailors of s, hazar toga atmostitutes, atantions, intered on ed from the hazarderessaly are dutions are their safety.

crion. (1) Walkways shall e contribly res on equipment. en to cruss over wea which contrily with provided where wate For more above lower

rier any sidal protection ail removely boated one mails, etc., s, prize sharts, even Lowered Upon comand other similar op cry wells, juits, shatts, etc.,

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n of employees in excavaeyee in an excavation n cave ins by an adein designed in accurn thi or (c) of this

(i) Encavations are made entirely in statie die die die

opol Estavations are less than 5 feet (1.52 m) in reput and examination of the ground by a pumperent person provides no indica-Den af a potential save-in.

(2) Protective systems shall have the capacty to resist without failure all loads that are intended or evalut reasonably the expected to be applied or transmitted to the system.

(b) Design of sloping and benching systems. The sloves and configurations of sloping and benching systems shall be seteried and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b.k.1), or, in the ulternative, paragraph (5,22), or, in the ulternative, paragraph (5,3), or, in the alternative, pariteraph (0,44, as follows:

(1: Option (1-Allowable configurations ind super the Excavations shall be slowed at an angle not steeper than one and onehalf horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed Leiu+

(ii) Slopes appendied in paragraph (b (134) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C and in Appendix 3 to this subject.

(2) Option (2)-Determination of slopes ind configurations using Appendices A and B. Macimum adowable stories, and allowatie contigurations for signing and benching systems, shall be determined in accordance with the conditions and requirements set funnin appendices A and B to this subpart.

(3) Option (3)-Cesigns using other ubulated data, (i) losigns of sloping or benching systems shall be selected from and in accordance with tabulated data, such as tables and charge.

(ii) The tabulatest data shall be in written form and shall include all of the following:

We Dontification of the transmeters that affect the selection of a scaling or benching Bystein drawn fruit soeth (242).

(B) Hentification of the limits of use of the fata, to include the magnitude and configuration of slopes determined to be safet

(C) Explanatory intermation as may be becksary to and the user in making a corfeet adjection of a projective system from the data.

(bii) At least one conv of the tabulated data which identifies the registered profesnonal engineer who approved the data, mail be maintained at the jobsite during construction of the protective system. After that time the ruta may be stored off Muste, but a copy of the data shall be made available to the Secretary opon request.

(4) Option (4)-Ovs go by a registered professional engineer of Slighting and benchind systems not utilizing option (1) or Op-tion (2) or Option (3) under paragraph (b) a this section shall be approved by a regisleted protessional engineer.

(ii) Designs shall be in written form and shall include at least the following:

(A) The magnitude of the slopes that ere determined to be sale for the particu-Fat brokect:

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(B) The cool of rations that were determined to be sate for the tathqular project. 104

(C) The identity of the registered professional engineer approving the design-

(iii) At least one logy of the design shall be maintained at the journe while the slope is hering constructed. After that time the design need not be up the posite, but a sign shall be made available to the Secretary upon request.

(c) Design of support systems, shield systems, and other protective systems. Designs of support systems shield systems, and other protective systems shall be selected and constructed by the employer or his designer and shall be in accordance with the requirements of paragraph (c (1), or, in the alternative, paragray, n < 2 < 2 < 60, in the alternative, paragray n < -2, n_1 in the alternative, paragray $n_1 < -2$, n_2 in the alternative, paragray $n_2 < 2$, n_3 in the alternative, paragray $n_2 < 2$, $n_3 < -2$, $n_4 < -2$, $n_5 < -2$ ternative, paragraphische, as follows.

(1) Option (1)—Exigns using aptendices A, C and F. Linugus bir timber shoring in trenches shall be determined in accordance with the conditions and requirementa set forth in attendices A and C to this subpart. Designs for aleminum by tradic shoring shall be in accordance with para-graph (CR2) of this section, but if manuface arer's tabulated data cannot be unuced, designs shall be in accordance with appendux D.

(2) Option (2)—Pessens Using Manufactuter's Tabulated Data, of Design of suppart systems, shald systems, or other protective systems that are drawn from manufacturer's tanuared data shall be in accordance with all specifications, recommendations, and indications record or mane by the manufacturer.

(h) Deviation from the somethetops. recommendations, and doctations bearing made by the manufacturer shart only ter anower after the manufacturer makes and efficientien at otstaal.

(iii) Manufacturer's specifications, reconimenetations, that antications, and manufacturer's approval of towards from the specifications, recommendations, and Hinstations shad or in written torm at the jobsite during construction of the protoclive system. After that there into outal may be stored off the junsite, but a copy shall be mane available of the Secretary usen regeest.

(3) Outon 3- Designs using other tabelited data (1) besigns of successful av-tents, smeld systems, or after protective systems shall be selected from and te in accondance with tabelated data, shift as tables and charts.

(ii) The tabulated data shall be in written form and include all of the following:

(A) Identification of the garameters that affect the selection of a protective system drawn from sech data:

(B) Identification of the limits of use of the data.

(C) Explanatory information as may be necessary to and the user of making a correct selection of a protective system from the data.

(iii) At least one copy of the tabulated data, which identities the registered profes-sional engineer who approved the data, shall be maintained at the posite during construction of the protective system. After that time the data may be stored off the

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jobsite, bon all loy of the data shall be made available to the Secretary spont reports (

can be a set foreign by a registered professional engineer (i) Suprove systems, shield o the is, and other processions systems Consince structure Option 1. Option 2 or Option 3 structure, shall be sportword by a registered processional engineer.

(di) Certains mail be in written form and shall include the following

(A) A t an indicating the sizes, types, and one's instants of the insterials to be used in the pritective system; and

(3) The mentify of the registered professional engineer approving the design-

(iii) At least one copy of the design shall be maintained at the jubiste during con-struction in the protective system. After that tures the pesign may be stored off the posite, but a copy of the design shall be made available to the Secretary upon request.

(d) Materials and equipment. (1) Materials and equipment used for protec-tive systems shall be free from damage or derects that might impair their proper function.

(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is onsistent with the recommendations of the manufacturer, and in a manner that will prevent entil oyee exposure to hazards.

is to When insticuted or component that is used for protective systems is damaged, a connected) cerson shall examine the material or e su ment and evaluate its untabl-tig for to success use. If the completent person of the assure the insterial or equipment is also to support the intended loads in its algorisher suitable for safe use, then sectionational of equipment shall be re-moved to in service, and shall be evaluated and aportional to a registered professional engineer tel relteing returned to service.

(e) Installation and removal of support, (1. Ceneral (i) Members of support. systems shall be securely connected to-gener to prevent sliding, failing, kickouts, Grother i redictable fanurel

(ii) Sultant systems shall be installed and removed in a manner that by included and removed in a manner that protects employees from dealering structural col-lapses, in them being struck by members of the subject system.

(iii) Les outlimembers of support systens she with a subjected to loads exceed-ing three which those members were those members were lesigned to substand.

(iv) Before temporary removal of individtial mentions begins, adoptional precautions shall be taken to ensure the safety of employers, seen as installing other structural members to tarry the loads imposed on the suppor aparent

(w) Romoval shall begin at, and progress from, the sation of the excavation. Memterts shall be released newly so its to note any initiation of possible failure of the remaining counters of the structure or possi-ble caveon of the sides of the excavation.

(vi) Buckfilling shall progress together with the removal of support systems from exeavations.

(2) Auditional requirements for support systems for trench ercavations, (i) Excava-tion of material to a level no greater than 2

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feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

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(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

(f) Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g) Shield systems. (1) General. (i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(2) Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is upen of a possible loss of soil from behind or below the bottom of the shield.

Appendix A to § 1926 Subpart P-Soil Classification

(a) Scope and application—(1) Scope. This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions, and on the structure and composition of the earth deposits. The appendix contains definitions, sets forth requirements, and describes acceptable visual and manual tests for use in classifying soils.

(2) Application. This appendix applies when a sloping or benching system is designed in accordance with the requirements set forth in § 1926.652(b)(2) as a method of protection for employees from caveins. This appendix also applies when timber shoring for excavations is designed as a method of protection from caveins in accordance with appendix to subpart P of part 1926, and when aluminum hydraulic shoring is designed in accordance with appendix 10. This appendic also applies when the protective systems are designed in accordance with appendix 10. This Appendix also applies if other protective systems are designed and selected for use from data prepared in accordance with appendix 1926.652(c), and the use of the data is predicated on the use of the solid casification system set forth in this appendix.

(b) Definitions. The definitions and examples given below are based on, in whole or in part, the following: American Society for Testing Materials (ASTM) Standards 1953-85 and 192488; The Unified Soils Classification System, The U.S. Department of Agriculture (USDA) Textural Class.

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sification Scheme; and The National Bureau of Standards Report BSS-121.

Cemented soil means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive soil means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

Dry soil means soil that does not exhibit visible signs of moisture content.

Fissured means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in a exposed surface.

Granular soil means gravel, sand, or silt, (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soil cannot be molded when moist and crumbles easily when dry.

Layered system means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

Moist soil means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

Saturated soil means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrumeter or sheer vane.

Suil classification system means, for the purpose of this subpart, a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

Stable rock means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Submerged soil means soil which is underwater or is free seeping.

Type A means cohesive soils with an unconfined compressive strength of 1.5 ton per square four (tsf) (144 KPa) or greater. Examples of cohesive soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

(i) The soil is fissured; or

(ii) The soil is subject to vibration from heavy traffic, pile driving, or similar ef. , fects; or

(iii) The soil has been previously disturbed; or

(iv) The soil is part of a sloped, layered ; system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or

(v) The material is subject to other fac. tors that would require it to be classified as a less stable material.

Type B means:

(i) Cohesive soil with an unconfined com. pressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or

(ii) Granular cohesionless soils including: angular gravel (similar to crushed rock), r silt, silt loam, sandy loam and, in some. cases, silty clay loam and sandy clay loam.

(iii) Previously disturbed soils except those which would otherwise be classed as Type C soil.

(iv) Soil that meets the unconfined compressive strength or cementation require: ments for Type A, but is fissured or subject y to vibration; or

(v) Dry rock that is not stable; or

(vi) Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C means:

(i) Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less or

(ii) Granular soils including gravel, sand, and loamy sand; or

(iii) Submerged soil or soil from which water is freety sceping; or

(iv) Submerged rock that is not stable, or (v) Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical

a hope of non-neutrality is the first strength means Unconfined compressive strength means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumbpenetration tests, and other methods.

Wet soil means soil that contains signifcantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to fluw when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cubesive properties when wet.

(c) Requirements—(1) Classification of soil and rock deposits. Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C in accordance with the definitions set forth in paragraph (b) of this appendix.

(2) Basis of classification. The classification of the deposits shall be made based on the results of a tleast one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using tests described in paragraph (d) below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture testural classification system. (3) Visual and manual. ual and manual analyse of this appendix, shall be a ducted to provide suffic: and qualitative information essary to identify properfactors, and conditions affecation of the deposits.

(4) Layered systems. I tem, the system shall be c: dance with its weakest each layer may be classi where a more stable layer stable layer.

(5) Reclassification. If, a deposit, the properties, it tions affecting its classific any way, the changes shall a competent person. The reclassified as necessary changed circumstances.

(d) Acceptable visua (ess.-(1) Visual tests. V conducted to determine q mation regarding the excav eral, the soil adjacent to the soil forming the sides of t. tion, and the soil taken a ercavated material.

(i) Observe samples of so vated and soil in the sides or Estimate the range of partirelative amounts of the pathat is primarily composed material is cohesive materia primarily of coarse-grained granular material.

 (ii) Observe soil as it is that remains in clumps wh cohesive. Soil that breaks up not stay in clumps is granul.

(iii) Observe the side of t vation and the surface area excavation. Crack-like openion cracks could indicate fitli chunks of soil spall off a v soil could be fissured. Smal dence of moving ground and of potentially hazardous situ

(iv) Observe the area adj; cavation and the excavatio dence of existing utilit underground structures, a previously disturbed soil.

(v) Observe the opened si vation to identify layered sys layered systems to identify slope toward the excavation degree of slope of the layers.

(vi) Observe the area adja cavation and the sides of th vation for evidence of surfac seeping from the sides of the the location of the level of the

(vii) Observe the area at excavation and the area with tion for sources of vibration t the stability of the excavation

(2) Manual tests. Manual tamples is conducted to detetative as well as qualitative toil and to provide more info der to classify soil property.

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ting When surmarse loads from stored material or equipment, operating equipmaterial in equilation operating energy person multipleterizing the degree to which person stati interforme the degree to which the initial solve this we reduced below the maximum allowance solve and shall assure that such reduct of solverend. Surcharge while the solver nach nach sealach in is ac neorach santaiste Baile troin achaich i christiares shaif ne erst-Bailent in choirde chroning 1926 obtion

(a) The action of our shall be less steep (11) the action over shall be less steep that the maximum abovable slots, when there are solve settings if that solution wates, the show will be cut back to ut interview. The setting of the solution of the solution. where the maximum state of the car back in the actual state state \sim at least 1/2 background to one vertical ($2724\,V$) less steep than the maximum 2...- auto slape.

(3) Actual survey of The actual slope shall not be steeper than the maximum allowable

(2) Maximum source for a solid of the maximum answer used for a solid or network poil and the poil and the solid of another the poil and the solid of another the poil and the solid of an of a solid of the solid of

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(a) Some and application. This appendix contains specifications for sliping and foncting sheet satisfies the sliping and ing entitiones as using in excavatoris from careens. The resulting in excavatoris from careens, the resulting in excavatoris from careens the test of shound some bench. auny and the iss shall signing and hench. Ing instantion and so an objing and bench-ing instantion because to be performed in activitizing and instantifements set (with in 3 (220/522.5/2)

Appendix B to (1005 Subpart P-Sieping and Benching

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(A) If the sample develops cracks as a cries, significant fissures are indicated.

(B) Samples that dry without cracking

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(B) Dry sciences. If the sol is lay and crumines while we at all deviate presure and relation we status of the powerer, it is granular carry initialization of gravel and, or step. If the static dry and falls and nante en servi a conservir a service and conservir and a service and a ser but the smaller clumus van only te broken op with drifts any it may be clay in any concernation with drawn, and drawn, and the still of out. If the dry soil preaks into comps which to not break up into small during and which can uny te broken with afficulty, and there is the visual indication the set is histored, the

or Planterry Most consist or websample di sud into a Sala di alternite to rod le into intreade as thin as i bouch in l'ameter. Cabeave material can be successfully collect our directory without from the providence of the second se Formeh thread satisfies selve as one end without learns, the out is lifet, a

(3) Visual and manual anarvies. The vis-(a) resonance manufacture many real rate size ar ine menter analyses, soon as conse said as being acceptable in incastophilid) of this appendix, shall be designed and condected to provide sufficient quantitative ind qualitative information as may be not estry to identify putpetily the properties, estry to memory property the properties, factors, and conditions affecting the classifiration of the deposits.

(4) Layered systems. In a layered sys-

(a) Educated sporeins and adjoiced sys-tem, the system shall be classified in accor-

ten, the system shart to classified in accor-dance with its weakest laper. However, each layer may be classified individually shere a more stable layer hes umber a less

(5) Reclassification 11, after classifying a

(2) Accussing and an an area cassing in a depait, the properties, factors, it condi-tions affecting its classification change in

iny say, the charges shall be evaluated by a conjector person. The dejust shall be

reclassified as necessary to reflect the

(d) Acceptable visual and manual

(d) Acceptance visitat and mattuar 1815.—(1) Visual tests, Visual analysis is

nation regarding the excavation are in gen-

mation regarding the sales and and an end of the sol he soil adjacent to the excitoration, the soil forming the sales of the open excitora-

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idative attoinita of the particle sizes. Sui matter anomal of the particle states on the barrier of fine gameric anternal softeners and emposed

subarity of metrocitants a solid of gravet is granting material.

(ii) (Reserve soil as it is even and. Soil that remains in themps, when even when its ensure and that here vie declars, and does be day in clumps is deat. Ja.

(iii) Observe the side of the monod occa-

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(v) Givenue the opened side of the exta-

terimory the operation of the exclusion when to dentify layered visiting. Examine layered systems to alerative if the layers done toward the exclusion. Estimate the

(vi) Observe the area adjacent to the ex-

We observe the area difference to the or-deation and the sides of the opened water water for evidence of service mater, water kening from the title of the encounter, water

the store of the sides of the exception, or

(vii) Observe the area adjacent to the

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Subpart P—Excavations

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Construction Standards

TABLE B-1

MAXIMUM ALLOWABLE SLOPES

Exception: Simple are 12 feet or less in (

2. All benched exca of ¼ to 1 and maximu

20' Max.

20' Max.

Soil or Rock Type	Maximum Allowable Slopes (H:V) ^[1] For Excavations Less Than 20 Feet Deep ^[3]			
Stable Rock	Vertical (90°) 3(4-1 (53°)			
Туре В Туре С	1:1 (45°) 1!/2:1 (34°)			

NOTES:

¹ Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

A short-term maximum allowable slope of $\frac{1}{2}$ H:1V (63°) is allowed in excavations in Type A'soil that are 12 feed (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be $\frac{3}{4}$ H:1V (53°).

³ Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of %:1.



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Construction Standards

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MULTIPLE BENCH

3. All excentions 20 feet or less in depth which have vertically aided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excentions shall have a maximum allowable slope of 1:1.



VERTICALLY SIDED LOWER PORTION

4. All other sloped excuvations shall be in accordance with the other options permitted in $\{1926,\delta22(n),$

B-1.3 Excavations Made in Type C Soil

1. All simple slope excavatious 20 feet or less in depth shall have a maximum allowable slope of 115:1.



SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a beight at least 18 inches above the top of the vertical side. All such accuvations shall have a maximum allowable slope of 1%:1.



VERTICAL SIDED LOWER PORTION

 $\mathbf{1},$ All other sloped excavations shall be in accordance with the other options permitted in §1925.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.

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Subpart P-Excavations



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Appendix C to § 1925 Subpart P-

State States

ge (1) Searce. This appendix contains informillion that can be used when timber shorby is provided as a method of protection from cave-ins in trenches that ito not exceed for careful in terreties that no not exceed 20 feet (0.1 m) in depth. This appendix must be used when dealsh of timber shoring just 60 bed when design of timber shoring pretrive systems is to be performed in iccordance with \$1026.652(cx1). Other unber shoring configurations; other systens of support such as hydraulic and preumatic systems; and other protective stiens such as sluping, benching, shield notices social as sociality, continue, sociality ind freezing systems must be designed ind income with the requirements icc forthing 1920 652(b) and § 1920 652(c).

(b) Sul Classification. In order to use the data presented in this appendix, the soil type of types in which the excavation is nuce must first be iletermined using the sol classification method set forth in appendix A of subpart P of this jure.

(c) Presentation of Information. Informaton is presented in several forms as follows: (1) Information is presented in tabular form in Tables C-1.1, C-1.2 and C-1.3, and Tables C-2.1, C-2.2 and C-2.3 following par-yraph (g) of the appendix, Each table presents the minimum sizes of timber mem-ers to use in a shoring continue memers to use in a shoring system, and each uble contains data only for the particular with the in which the excertation of fortion of the excavation is made. The data are arranged to allow the user the flexibility to wiert from among per erat acceptable configurations of members based on varying informations of memory based on varying the horizontal separing of the crossibaces, Budie took is exempt from shoring require-ments and therefore, no case are presented beine conditions. la mis condition.

(2) Internation concerning the hards of the tabular state and the forstations of the data is presented in paragraph (d) of this appendix, and on the factors themselves.

(3) Information explaining the use of the ucular data is presented in paragraph (e)

(4) Information illustrating the use of the tabular data is presented in paragraph (f) of this appendix.

(in appendix)
 (b) Miscellaneous instations regarding F2-bles C-11 through C-13 and Tames C-24 (hough C-23 are presented in paragraph (poliths Appendix)

(d) Basis and limitations of the data,-(d) basis and miniations of the initia-(l) Dimensions of timber members, for The ites of the timber members listed in Tables CLI through CLI, are taken from the Na-tional memory of Science and Sciences (Ional Bureau of Standards (NBS) repart, Recommended Technical Provisions for Accommented Technical Provisions on Construction Practice in Shoring and Sup-ing of Trenches and Secarations," In acti-tion, where NIRS and not recommend usering the NIRS and not recommend specific stees of members, member stees are bed on an analysis of the sizes required for use by existing cules and on empirical

(ii) The required dimensions of the memters listed in Tables Cell through Cells teler to actual dimensions and not nominal dimensions of the tunker. Employees wante the total of the tunner. Composed more ing to use tooning size shoring are directed to Tables C.2.1 through (1.2.3) or have this choice on the structure structure on the structure of the struct choice under \$1920.6526(\$3), and are re-ferred to The Corps of engineers. The Buread of Reclamation of data from other acceptable sources.

(2) Littletation of application, (i) It is not intended that the unifor shoring specificathe apply to every situation that thay be

experienced in the field. These data were developed to apply to the initiations that are must communily experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this adjunction must be designed as specifica in § 1920 032(c).

(ii) When any of the following conditions are present, the members steelined in the tables are not considered steepute. Either (anis) are not considered adequate. Eliner an alternate timber shoring system must be designed or adother type of protective sys-tem designed in alcoholance with § 1000.052.

(A) When loads imposed by structures or by stored material adjacent to the trench weigh in excess of the loss influent by a weigh in excess of the west influent by a two-foot soil surcharge. The term "adja-cent" as used note means the area within a horizontal critance from the evge of the transformer term into the transformer. trench equal to the depth of the trench.

(B) When vertical hards improved on stress braces exceed a 240-pvenu gravity load diatributed on a une-lost section of the center of the crossorace,

(C) When surcharge loads are present from equipment weighing in eacess of 20,000 photos

(D) When only the lower portion of a (D) when only the lower portion of a trench is shared and the remaining portion of the trench is sloped or tenched unless. The sloped numerical and an article less effects the trench tenched unless. steep than ince horizontal to one vortical; Steep than increasing to one variable of the members are exceed from the tables for use at lepith which is information from the top of the overall treas, and bot from the top of the overall treas. the tee of the stoped portion.

(e) Use of Tables. The members of the (c) Use of radies. The itembers of the shoring system that are to be refected using this information are the class braces, the uprefits, and the waves, where walks are specified for the ite uniform offers of soft. There are set tables of effected to be at information there are set tables of effected to be at information. Affective of the use of addressed Stress of soft There are sectables of addressed builds for each soft type. The soft syle must first be determined in accordance with the soft clasdetermines of an environment of a determine A to subject to a start determine an advertise A to subject to a start determine a determine a determine ale table, the selection of the star and space ate tame, the selection is the selection space-ing of the members is then made. The selection is based as the define and width of the trench where the members are to be the trench where the members are to be installed and, it must metatops, the selection is also based on the composital spacing the crussificates, Instances where a charge of horizonical spacing of crossbracing is available, the horizontal starting of considerates must be closed by the user biosonares must be chosen by the user hence the area if any mention can be deter-mined. When the soil type, the width and depth of the trench, and the horizontal specing of the clossbraces are known, the size and vertical specing if the clossbraces are known, the size and vertical bracers and are known, the size and vertical spacing of the ensubraces, the size and vertical spac-ing of the view, and the size and horizontal spacing of the oprights can be read from the appropriate table.

(I) Examples to Illustrate the Use of Ta-bles C-1 Through C-1.3 (1) Example 1.

A trench due in Trive A soil is 13 feet deep and tice feet wide.

From Table C.I.I. for acceptable are rangements of timber can be used. Arrangement A

Space 4 - 1 - rossonaces at six feet horizonstally and not feet vertically. Waves are not required.

13Ilv

Space 3x8 uprights at six feet horizon-tally. This arrangement is commonly called "skip choring." Arrangement 12

zentally and four feet vertically.

Space 2xd uprights at four feet horizontally

Arrangamant (1

Space 5. 7 crossbraces at 10 feet horizon-taily and four feet vertically. Space SociO wales at four feet vertically.

Spece 2x6 aprights at five feet horizontaily

Arransement ja

Space on 5 crossbraces at 12 feet horizontally and four feet vertically.

Space 10, 10 wales at four feet verifcally.

Space 3×5 uprights at six feet horizoncally.

(2) Enample 2.

A trench dug in Type B soil is 13 feet deep and five feet wide. From Table C-1.2 three acceptable arrangements of members are listery.

Arranşement 41

Space to 5 crossbraces at six feet lunizontaily in , two feet vertically,

Space 2. 3 wales at five feet vertically. Spare 2.40 uprights at two feet huridon-

tadv Ananzement 12

State C. S compliances at gight feet hurls Contrary in a time feet vertically.

Space 12% 10 wales at five feet vertically. Shall 2x3 aprights at two feet horizon-وإيها

Arrangement \$3

Sugar 3, 3 crossbraces at 10 leut horizontaily and the feet vertically. Space 11x12 wales at five feet vertically

Space 2x6 uprights at two lest verti-Cally

(3) Ziumple 3.

A trench day in Type C soil is 13 feet deep and five feet wide.

From Table C-1.3 two acceptable arfutizements of members can be used.

Arran, ement 31

Space 5 - 8 crossbruces at six feet horizontally and five feet vertically.

Space 10x12 wales at five feet vertically Praction 21 to uprights as closely together as pressioner

If water must be retained use special tongue and grouve aprights to form tight Artaisement #2

Space 2.c10 crossbraces at eight feet horicontaily and five feet vertically.

Space (2×12 wales at five feet vertically, Pontion 2×6 uprights in a close sheering

configuration unless water inessure must be consisting markes where include mine or resisted. Fight sheeting must be used where water must be retained.

(4) £.4mple 4.

A trench duy in Type C soil is 20 (set deen about 1) feet while. The size and sharing of measures for the section of trench that is § 1925 Subpart P App. C

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Space 4 - 5 crosbraces at eight feet huri-

Space 3x3 wales at four feet vertically.

Construction Standards

over 15 feet in depth is determined using Table C-1.3. Only one arrangement of members is provided.

Space 8×10 crossbraces at six feet horizontally and five feet vertically.

Space 12×12 wales at five feet vertically.

Use 3×6 light sheeting.

Use of Tables C-2.1 through C-2.3 would follow the same procedures.

(g) Notes for all Tables.

1. Member sizes at spacings other than indicated are to be determined as specified in § 1926.652(c), "Design of Protective Systems.

2. When conditions are saturated or sub-merged use Tight Sheeting. Tight Sheeting refers to the use of specially-edged timber

planks (e.g., tongue and groove) at least three inches thick, steel sheet piling, or similar construction that when driven or placed in position provide a tight wall to resist the lateral pressure of water and to prevent the loss of backfill material. Close Sheeting refers to the placement of planks side-by-side allowing as little space as possible between them.

3. All spacing indicated is measured center to center.

4. Wales to be installed with greater dimension horizontal.

5. If the vertical distance from the center of the lowest crossbrace to the bottom of the trench exceeds two and one-half feet, uprights shall be firmly embedded or a

mudsill shall be used. Where uprights are embedded, the vertical distance from the center of the lowest crossbrace to the box. tom of the trench shall not exceed 36 inches When mudsills are used, the vertical distance shall not exceed 42 inches. Mudsilla are wales that are installed at the tow of the trench side.

6. Trench jacks may be used in lieu of or in combination with timber crossbraces.

7. Placement of crossbraces. When the vertical spacing of crossbraces is four feet, place the top crossbrace no more than two feet below the top of the trench. When the vertical spacing of crossbraces is five (eet, place the top crossbrace no more than 25 feet below the top of the trench.

Table C-1.1

Timber Trench Shoring-Minimum Timber Requirements *

Soil Type A P = $25 \times H + 72$ psf (2 ft Surcharge)

					Size	(Actual)	ng of Merr	ibers **	·····					
Durch		Cross Braces						Wales			ιι	Jpright	s	
of Trench	Horiz. Suacing	<u></u> <u></u> <u></u>	Width Up to	of Trenc	h (feet) Up to	Unio	Vert. Soacing	Size	Vert. Spacing	Maximum Allowable Horizontal Spacing (feet)				
(feet)	(feet)	+	6	9	12	15	(feet)	(in)	(feet)	Close	4	5	6	8
5		4×4	4×4	4×6	6×6	6×6	4	Not Req'd					2×6	
To,	Up to 8	4×4	4×4	4×6	6×6	6×6	÷ 4	Not Req'd						2×8
10	Up to 10	4×6	4×6	4×6	6×6	6×6	4	8×8	4			2×6		
•••••••••••••••••••••••••••••••••••••••	Up to 12	4×6	4×4	4×6	6×6	6×6	4	8×8	4				2×6	
10	Upιο 6	4×4	4×4	4×6	6×6	6×6	4	Not Req'd					3×8	
То	Up to 8	4×6	4×6	6×6	6×6	6×6	4	8×8	4		2×6			
15	Up to 10	6×6	6×5	6×6	6×8	6×8	4	8×10	4			2×6		
-	Up to 12	6×6	6×6	6×6	6×8	6×8	4	10×10	4				3×8	
15	Սթ ւօ 6	6×6	6×6	6×6	6×8_	6×8	4	6×8	4	3×6				
To	Üριο 8	б×б	бхб	6×6	6×8	6×8	+	8×8	4	3×6				
20	Up ιο 10	8×8	8×8	8×8	8×8	8×10	4	8×10	4	3×6				
··	Up to 12	8×8	8×8	8×8	8×8	8×10	4	10×10	4	3×6				
Over 20	See Not	e 1										_		

Depth Horiz. Trench Ŭρι Spacing (feet) (leet) Up to 5 4×c 6 Up to То 8 б×ć Up ιο 10 i0 бхб See Note 1 **Up** ιο 10 6 бхб Սր ւօ 8_____ To 6х8 **Up** ιο 15 i0 8×8 See Note 1 Up ιο 15 6 6x8 Up to 8 Тο 8×8 **Up** ιο 20 10 8×10 See Note 1 Over 20 See Note 1

* Mixed oak or (** Manufactured

Mixed oak or equivalent with a bending strength not less than 850 psi.
 Manufactured members of equivalent strength may be substituted for wood.

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Subpart P-Excavations

L Where uprights are

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a succes is four feet as succes is four feet as to more than the the trench. When the osobraces is five feet as to more than 23

Horizontal .,)

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3×3

2-3

Table C-1.2

Timber Trench Shoring-Minimum Timber Requirements *

				Soil Typ	e B P, -	= 45 x 1	! <u>I + 72</u> ρ	si (2 ft St	(rcharge)					
					Size	(Actual)	and Space	iy of Mem	iers **					
			C	ross Brac	c8			W.	105			lprights		
Depta 01	Horiz.	1	Width	of Tree	n (feat) (///////		Vert.	e'n.	Vert.	Maz.	mu m A Sou	llowable cinz vier	Herizo O	ntal
(foet)	- tiesta	4	5	9 9	12	15	(leet)	0.05 (it.)	Geet)	Class	2	3	1	
5	Up to 6	425	4×6	675	5×5	6×6	5	6×3	5			2×5		
To	Up to B	うそう	6×6	óxó	<u>6×8</u>	<u>ó≍3</u>	5	3×10	5			2:×6		
10	ປັງ ເວ 10	526	óxó	62.5	6×8	όχδ	5	10x10	5		• 1 5	2×5		
	See Note I													
10	Up to 6	őxő	όχό	ด้หต่	6×8	რა ჭ	5	848	5		2.<5			
Τu	ປັງ ເບ ວ	143	<u>6×8</u>	चे स्र <u>व</u> े	373	823	5	10×10	5		2.5			
15	υρτο 10	3-3	8×8	<u>8×3</u>	3:<8	S×10	5	10x12	5		2::5			
	See Note 1						r							
15	Uptu R	for g	0.48	623	exe	8:3	5	3.17	3	3 16				
T.)	- 5р. ц. Я	3-3	343	323	Sed	3 - 14	5	10.12	5	36				
20	Upto 10	<u>3 10</u>	ax 10	<u>8,kt0 (</u>	3 - 10	105 It	5	12×12	:	3 - <u>-</u>		-		
	See Note 1													
Over	2 . V													

Mixed tak or symmalent with a bending strength not less than 650 juin.
 Manufactured memory of equivalent strength may be seasurated for work.

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Table C-1.3

Timber Trench Shoring-Minimum Timber Requirements *

				Soil Typ	ce C P	= 80 × E	H + 72 ps	f (2 ft St	rcharge)					
					Size	(Actual)	and Spacir	g of Mem	bers **					
Deput			C	cross Bra	ces		_	W	ales		U	Ipright	s	
	Horiz.		Width	of Trend	ch (feet)		Vert.		Vert.	Maxi	mum A	llowabl	e Horiz	ontal
french (feet)	(feet)	Up to 4	Üριο ό	Up to 9	Up to 12	0pto 15	Spacing (feet)	Size (in)	Spacing (feet)	Close			ie inole	
5	Upιο 6	6×8	6×8	6×8	8×8	8×8	5	8×10	5	2×6				
To	Up ιο 8	8×8	8×8	8×8	8×8	8×10	5	10×12	5	2×6				
10	Upιο 10	8×10	8×10	8×10	8×10	10×10	5	12×12	5	2×6				
	See Note 1													
10	-Up ιο 6	8×8	8×8	8×8	8×8	8×10	5	10×12	5	2×6				
To	Uρ το 8	8×10	8×10	8×10	8×10	10×10	5	12×12	5	2×6				
15	See Note I													
	See Note 1												'	
15	Up ia 6	8×10	8×10	8×10	8×10	10×10	<u>-</u> 5	12×12	5	3×6				
Τo	See Note 1													
20	See Note I													
	See Note 1													
Over 20	See Noi	e 1									-			

Mixed oak or equivalent with a bending strength not less than 850 psi. Manufactured members of equivalent strength may be substituted for wood.

Depth	Horiz	
Trench (feet)	Spacing (feet)	Up ↓
5	υριο δ	<u>4 ×</u>
To	Up to 8	4×
10	Upιο 10	4×
	Up ιο 12	4×
10	Uр to б	4 ×
To	Up το 8	4x
15	Մp ւօ 10	6x
	Upιο 12	6×
15	Up 10 6	б×
To	Up το 8	б×
20	Up to 10	6×
	Upιο 12	б×
Over 20	See Not	e 1

4

* Douglas fir c ** Manufactur

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Subpart P—Excavations

Table C-2.1 Timber Trench Shoring-Minimum Timber Requirements * Soil Type A $P_a = 25 \times H + 72$ psf (2 it Surcharge)

Uprights im Allowable Horizonial ng (leet) (See Note 2)

۰ų

	[Si	ze (S4S)	and Spacin	ng of Men	abers **					
	ļ		C	russ Brac	5			W	ales	1		Joright	.5	
Depth	Horiz.		Width	of Trenc	h (feet)	Linu	Vert.	Sian	Vert,	Max	ximum A Spa	llowabl	e Horizo cet)	ntal
french (feet)	(feet)	4	6	9	12	15	(leet)	(in)	(lect)	Cluse	4	5	j.	8
5	Uр tо б	+×+	4%4	4×4	4×4	4×6	4	Not Req'd	Not Reg'd	L		:	4×6	
Tυ	Մր ւս 8	4×4	4×4	4×4	+×ó	4×6	4	Not Req'd	Not Reg'd					4×8
10	Ŭp το 10	+×ό	4×6	4×6	ő×ő	6×6	4	8×8	4			4×6		
	Up to 12	4×ó	∔×ό	4×6	<u>όχ</u> ό	бхб	4	8×8	4				4×6	
10	Up το ό	4×4	4×4	4×4	όχο	6×6	-4	Not Reg'd	Nut Req'd				4×10	
To	Մp ւս 8	4×ó	4×6	4×0	óxó	6×6	4	óx8	+		4×6			
15	Up το 10	<u>ό</u> χό	óxó	6×0	óxó	6×6	+	8×8	4			+×8		
	Uр ю 12	δχό	άχά	б×б	óxó	5×6	4	8×10	+		4×6		4×10	
15	Մր to Ծ	бжб	6×6	6×6	óxó	ό ≍δ	-	_6×8	+	3×6				
ΤJ	Մթ.ա - 3	6×6	<u>6×6</u>	6×6	อี่มถ์	óxó	4	8×8	4	3×6	4×12			
20	Up to 10	6×6	6×5	бхб	6×6	6×8	+	8×10	4	3×6				
	Up to 12	6×б	őxó	6×ΰ	6×8	6×8	4	8×12	4	3×6	4×12			
Over 20	See Not	e 1												

Douglas fir or equivalent with a bending strength not less than 1500 psi,
 Manufactured members of equivalent strength may be substituted for wood

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Table C-2.2

Timber Trench Shoring—Minimum Timber Requirements * Soil Type B P. = 45 × H + 72 psf (2 ft Surcharge)

					Si	ze (S4S)	and Spaci	ng of Mer	nbers **					
Dearb			Cr	oss Brac	es			W:	iles			Uprights	;	
of Trench	Horiz. Spacing	<u></u> <u></u> <u></u>	Width Up to	ui Trenc Up to	h (ίσει) Πριο	<u></u> Up ιο	Vert. Spacing	Size	Vert. Spacing	Ma	^د . ximum Sp	llowable acing (fe	e Horizo et)	ontal
(feet)	(feet)	4	6	9	12	15	(feet)	(in)	(feet)	Close	2	3	4	6
5	Up το 6	4×6	4×6	4×6	6×6	6×6	5	6×8	5	•		3×12 4×8		4×12
To	Up to 8	4×6	4×6	6×6	6×6	6×6	5	8×8	5		3×8		4×8	
10	Up ιο 10	4×6	4×6	6×6	6×6	6×8	5	8×10	5			4×8		
	See Note 1													
10	Up ιο 6	6×6	6×6	6×6 6×6 6×8 6×8 6×8 6×8 8×8 8×8		ó×8	5	8×8	5	3×6	4×10			
To	Up ιο 8	6×8	6×8	<8 6×8 8×8 8×8		5	10×10	5	3×6	4×10				
15	Up ιο 10	6×8	6×8	6×8 6×8 8×8 8×8 6×8 8×8 8×8 8×8		5	10×12	5	3×ó	4×10		,		
	See Note 1					4								
15		6×8	6×8	6×8	6×8	8×8	5	8×10	5	4×ó				
To.	Uр to 8	6×8	6×8	6×8	8×8	8×8	5	10×12	5	+×ó				
20	Upιο 10	8×8	8×8	8×8	8×8	8×8	5	12×12	5	4×6				
	Se e Note 1								,					
Over 20	See Not	e 1												

Douglas fir or equivalent with a bending strength not less than 1500 psi.
 Manufactured members of equivalent strength may be substituted for wood.

·.·		
Depth of Trench (feet)	Horiz. Spacing (feet)	Up ιο 4
5	Upιο ό	6×6
:-To	Upιο 8	6×6
10	Upιο 10	6xó
	See Note 1	
10	Up 10 6	6×8
To	Uр to 8	8×8
15	See Note 1	
	See Note 1	
15	Uр to 6	8×8_
To	S ee Note 1	
20	: See Note 1	
ļ	See Note 1	
Over 20	See No	te 1

Douglas fir or Manufactured

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Subpart P-Excavations

Table C-2.3

Timber Trench Shoring-Minimum Timber Requirements * Soil Type C P₄ = $80 \times H + 72$ psf (2 ft Surcharge)

Uprights in Allowable Horizontal Spacing (feet) 2

> 3×12 4×8

4×8

3×8

10

<u>4×</u>10

10

1,44.5

4

4×8

6

4×12

:					Siz	e (S4S) ai	nd Spacing	of Membe	ers **					
			C	ross Bra	ces			W:	lies		l	Jpright	ŝ	
Depth of	Horiz.	Unio	Width	of Trend	th (feet)	. 10 10	Vert. Spacing	Size	Vert. Spacing	Maxi	mum A Spe	llowab icing (fe	e Horiz re l)	ontal
(feet)	(feet)	4	6	9	12	15	(ieet)	(in)	(feet)	Close		[1	
5	Upιο 6	6×6	6×6	6×6	6×6	8×8	5	8×8	5	3×6				
- To	Up to 8	6×6	6×6	6×6	8×8	8×8	5	10×10	5	3×6				
10	Up ιο 10	6×6	6×6	8×8	8×8	8×8	5	10×12	S	3×6				
	See Note I													
10	Սp ւo 6	6×8	6×8	6×8	8×8	8×8	5	10×10	5	4×6				
To	Up to 8	8×8	8×8	8×8	8×8	8×8	5	12×12	5	4×6				
15	See Note 1													
	See Note 1					Ŧ							,	
15	υριο 6	8×8	8×8	8×8	8×10	8×10	: 5	10×12	5	4×6				
To	See Note 1					, 								
20	See Note 1				•									
	See Note 1													
Over 20	See Nor	e 1												

Douglas fir or equivalent with a bending strength not less than 1500 psi. Manufactured members of equivalent strength may be substituted for wood.

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Appendix D to § 1926 Subpart P-Aluminum Hydraulic Shoring for Trenches

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(a) Scope. This appendix contains infor-ation that can be used when aluminum hydraulic shoring is provided as a method of protection against cave-ins in trenches that do not exceed 20 feet (6.1m) in depth. This appendix must be used when design of the aluminum hydraulic protective system cannot be performed in accordance with § 1926.652(cX2).

(b) Soil Classification. In order to use data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil classification method set forth in appendix A of subpart P of part 1926.

(c) Presentation of Information. Information is presented in several forms as follows:

(1) Information is presented in tabular form in Tables D-1.1, D-1.2, D-1.3 and D-1.4. Each table presents the maximum vertical and horizontal spacings that may be used with various aluminum member sizes and various hydraulic cylinder sizes. Each table contains data only for the par-ticular soil type in which the excavation or portion of the excavation is made. Tables D-1.1 and D-1.2 are for vertical shores in Types A and B soil. Tables D-1.3 and D-1.4 are for horizontal waler systems in Types B and C soil.

(2) Information concerning the basis of the tabular data and the limitations of the data is presented in paragraph (d) of this appendix.

(3) Information explaining the use of the tabular data is presented in paragraph (e) of this appendix.

(4) Information illustrating the use of the tabular data is presented in paragraph (i) of this appendix.

(5) Miscellaneous notations (Footnotes) regarding Table D-1.1 through D-1.4 are presented in paragraph (g) of this appendix.

(6) Figures, illustrating typical installations of hydraulic shoring, are included just prior to the Tables. The illustrations page is entitled "Aluminum Hydraulic Shoring: Typical Installations."

(d) Basis and limitations of the data.

(1) Vertical shore rails and horizontal wales are those that meet the Section Modulus requirements in the D-1 Tables. Aluminum material is 6001-T6 or material of equivalent strength and properties.

(2) Hydraulic cylinders specifications. (i) 2 inch cylinders shall be a minimum 2 inch inside diameter with a minimum safe working capacity of no less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimum 3-inch inside diameter with a safe working capacity of not less than 30,000 pounds axial compressive load at extensions as recommended by product manufacturer.

(3) Limitation of application.

(i) It is not intended that the aluminum hydraulic specification apply to every situation that may be experienced in the field. These data were developed to apply to the situations that are most commonly experienced in current trenching practice. Shoring systems for use in situations that are not covered by the data in this appendix

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must be otherwise designed as specified in § 1926.652(c).

(ii) When any of the following conditions are present, the members specified in the Tables are not considered adequate. In this case, an alternative aluminum hydraulic shoring system or other type of protective system must be designed in accordance with § 1926.652.

(A) When vertical loads imposed on cross braces exceed a 100 Pound gravity load distributed on a one foot section of the center of the hydraulic cylinder.

(B) When surcharge loads are present from equipment weighing in excess of 20,000 counds.

(C) When only the lower portion of a trench is shored and the remaining portion of the trench is sloped or benched unless: The sloped portion is sloped at an angle less steep than three horizontal to one vertical; or the members are selected from the tables for use at a depth which is determined from the top of the overall trench, and not from the toe of the sloped portion.

(e) Use of Tables D-1.1, D-1.2, D-1.3 and D-1.4. The members of the shoring system that are to be selected using this informa-tion are the hydraulic cylinders, and either the vertical shores or the horizontal wales. When a waler system is used the vertical timber sheeting to be used is also selected from these tables. The Tables D-1.1 and D-1.2 for vertical shores are used in Type A and B soils that do not require sheeting ype B soils that may require sheeting, and Type C soils that always require sheeting. are found in the horizontal wale Tables D-1.3 and D-1.4. The soil type must first be determined in accordance with the soil classification system described in appendix A to subpart P of part 1926. Using the appropriare table, the selection of the size and spac-ing of the members is made. The selection is based on the depth and width of the trench where the members are to be installed. In these tables the vertical spacing is held constant at four feet on center. The tables show the maximum horizontal spacing of cylinders allowed for each size of wale in the waler system tables, and in the vertical shore tables, the hydraulic cylinder horizontal spacing is the same as the vertical shore spacing.

(f) Example to Illustrate the Use of the Tables:

(1) Example 1:

A trench dug in Type A soil is 6 feet deep and 3 feet wide. From Table D-1.1: Find vertical shores and 2 inch diameter cylinders spaced 8 feet on center (o.c.) horizontally and 4 feet on center (o.c.) vertically. (See Figures 1 & 3 for typical installations.)

(2) Example 2:

A trench is dug in Type B soil that does not require sheeting, 13 feet deep and 5 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinders spaced 6.5 feet o.c. horizontally and 4 feet o.c. vertically. (See Figures 1 & 3 for typical installations.)

(3) A trench is dug in Type B soil that does not require sheeting, but does experi-ence some minor reveling of the trench face. the trench is 16 feet deep and 9 feet wide. From Table D-1.2: Find vertical shores and 2 inch diameter cylinder (with special over sleeves as designated by Footnote ¥2) spaced 5.5 feet o.c. horizontally and 4 feet

o.c. vertically. Plywood (per Footnote (gX7) to the D-I Table) should be used behind the shores. (See Figures 2 & 3 for typical installations.)

(4) Example 4: A trench is dug in previ-ously disturbed Type B soil, with character-istics of a Type C soil, and will require sheeting. The trench is 18 feet deep, and 12 feet wide 8 foot horizontal spacing between cylinders is desired for working space. From Table D-1.3: Find horizontal wale with a section modulus of 14.0 spaced at 4 feet o.c. vertically and 3 inch diameter cylinder spaced at 9 feet maximum o.c. horizontally 3 x 12 timber sheeting is required at close spacing vertically. (See Figure 4 for typical installation.)

(5) Example 5: A trench is dug in Type C soil, 9 feet deep and 4 feet wide. Horizontal cylinder spacing in excess of 6 feet is de-sired for working space. From Table D-14: Find horizontal wale with a section module of 7.0 and 2 inch diameter cylinders spaced at 6.5 feet o.c. horizontally. Or, find horiontal wale with a 14.0 section modulus and 3 inch diameter cylinder spaced at 10 feet o.c. horizontally. Both wales are spaced 4 feet o.c. vertically. 3 x 12 timber sheeting is 1 required at close spacing vertically. (See Figure 4 for typical installation.)

(g) Fournotes, and general notes, for Tables D-1.1, D-1.2, D-1.3, and D-1.4.

(1) For applications other than the listed in the tables, refer to § 1926.652(cX2) for use of manufacturer's tabulated data. For trench depths in excess of 20 feet, refer to § 1926.652(cX2) and § 1926.652(cX3).

(2) 2-inch diameter cylinders, at this width, shall have structural steel tube (3.5 x 3.5 x 0.1875) oversleeves, or structural oversleeves of manufacturer's specification, extending the full, collapsed length.

(3) Hydraulic cylinders capacities. (i) (3) Hydraulic cylinders capacities, (6) 2-inch cylinders shall be a minimu 2-inch inside diameter with a safe working capac-ity of not less than 18,000 pounds axial compressive load at maximum extension. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(ii) 3-inch cylinders shall be a minimur 3-inch inside diameter with a safe work capacity of not less than 30,000 pounds axial compressive load at maximum exten-1 sion. Maximum extension is to include full range of cylinder extensions as recommended by product manufacturer.

(4) All spacing indicated is measured center to center.

(5) Vertical shoring rails shall have a minimum section modulus of 0.40 inch.

(6) When vertical shores are used, there must be a minimum of three shores spaced equally, horizontally, in a group.

(7) Plywood shall be 1.125 inch thick softwood or 0.75 inch thick, 14 ply, arctic white birch (Finland form). Please note that plywood is not intended as a structural member, but only for prevention of local raveling (sloughing of the trench face) between shores.

(8) See appendix C for timber specifications.

(9) Wales are calculated for simple span conditions.

(10) See appendix D, item (d), for basis and limitations of the data.

FIGURE NO. 1 MALLE STORES (mot much

XOITZOXTAL

1 CLC





2 '

XAX.

FIGURE NO. ۲۲۵۹۱۲۵ کالعامل ۲۲۵۹۰۱۳۵ کالعام (3145410)

+0+120+1

SPACING

Subpart P-Excavations

ALUMINUM HYDRAULIC SHORING

any. Plywood (per Footnote (gX7) i Table) should be used behind the ee Figures 2 & 3 for typical instal ng!!

an ee 4: A trench is dug in prevut ad Type B soil, with character. a Type C soil, and will require The trench is 18 feet deep, and 12 8 feet horizontal spacing between is sisted for working space. From 1. Find horizontal wale with a course of 14.0 spaced at 4 feet o.c. / and 3 inch diameter cylinder 9 feet maximum o.c. horizontally, mber sheeting is required at close regally. (See Figure 4 for typical

induct 5: A trench is dug in Type C t deep and 4 feet wide. Horizontal spacing in excess of 6 feet is dewriging space. From Table D.1.4; ztu 1 wale with a section modulus d thch diameter cylinders spaced et the horizontally. Or, find horiile with a 14.0 section modulus and ameter cylinder spuced at 10 feet iontally. Both wales are spaced 4 re tally, 3 x 12 timber sheeting is a lose spacing vertically. (See for pical installation.)

otnotes, and general notes, for Ta. 1, D-1.2, D-1.3, and D-1.4.

or polications other than those the obles, refer to § 1926.652(c χ) of mulacturer's tabulated data, it depths in excess of 20 feet, refer >.652(c χ 2) and § 1926.652(c χ 3), i

in the providence of the second secon

ydraulie cylinders capacities. (i) di frs shall be a minimum 2-inch ar er with a safe working capacid as than 18,000 pounds azial sive bud at maximum extension, m extension is to include full range, ler extensions as recommended by manufacturer.

in cylinders shall be a minimum as diameter with a safe work of not less than 30,000 pounds mpressive load at maximum extenatimum extension is to include full if minder extensions as recom-

by oduct manufacturer.

Il macing indicated is measured o center.

ertical shoring rails shall have a minimum from modulus of 0.40 inch.

here bertical shores are used, there a minimum of three shores spaced horizontally, in a group.

lywood shall be 1.125 inch thick 1 + 0.75 inch thick, 14 ply, arctie re Finland form). Please note that 1 + but intended as a structural 2 + but only for prevention of local 3 (sloughing of the trench face) bebures.

re pendix C for timber specifica-

fales are calculated for simple span

empopendix D, item (d), for basis



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Table D-1.1 Aluminum Hydraulic Shoring Vertical Shores For Soil Type A

Timber Uprights

Table D.1.3 Aluminum Hydraulic Shoring Waler Systems For Soil Type B

Hydraulic Cylinders

W'ales

			Hydraulic Cylinder	S			
Death	Maximum	Maximum		Width of Trench (fee	:)		
of Trench (ieet)	Horizontal Spacing (feet)	Vertical Spacing (feet)	Up to 8	Over 8 Up to 12	Over 12 Up to 15		
Over 5 Up to 10	8				3 inch Diameter		
Over 10 Up to 15	8	4	2 inch Diameter	2 inch Diameter Note (2)			
Over 15 Up to 20	7						
Over 20	Noti	e (1)					

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g) Note (1): See Appendix D, Item (g)(1) Note (2): See Appendix D, Item (g)(2)

Table D-1.2

Aluminum Hydraulic Shoring Vertical Shores For Soil Type B

	1	Hydraulic Cylinders									
Denth	Marimum	Marimum		Width of Trench (iee	:)						
of Trench (feet)	Horizontal Spacing (feet)	Vertical Spacing (leet)	Up 10 8	Оver 8 Up 10 12	Over 12 Up to 15						
Over 5 Up to 10	8										
Over 10 Up to 15	6.5	4	2 inch Diameter	2 inch Diameter Note (2)	3 inch Diameter						
Over 15 Up 10 20	5.5										
Over 20	Not	e (1)									

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D. Item (g) Note (1): See Appendix D. Item (gX1) Note (2): See Appendix D. Item (gX2)

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0xer 12 Up to 15

3 iach Diameter

Over 12 Up to 15

3 inch Diamster

-15

	-	alcs			Hydraeth	e Cyhnders				aner Uprug	nts .
Derich					Width of 7	l'rench (feet)) Alax. (Horiz, Spa on Center)	cing
Trench	Vertical Spacing	Section Micdulus	1	10.5	Over 8	Up to 12	Over 12	Up to 15	Solid Sheet	2 h.	3 ft.
(feet)	(teet)	(111)	Hurr	Cylinder Duameter	Horiz Specinic	Cylinder Diameter	Horiz. Spacing	Cylinder Dismeter			
		3.5	8.0	2 iii	03	2 in Note(2)	8.0	3 in			
Over 5 Up to 10	×۳ 	2.0	0.0	u c	0.6	2 in Flore (2)	9.0	3 in		-	3×12
		1:0	12.0	3 in	12.0	3 in	12.0	3 in			
		3.5	6.0	ei c	0.9	2 in Note(2)	6.0	3 in			
Оver 10 Пр но 15	* 7	7.0	8.0	3 in	8.0	3 in	8.0	3 in		3×12	
		0.1-1	10.0	3 in	10.0	3 in	10.0	3 in			
		3.5	5.5	2 in	5.5	2 in Note(2)	5.5	3 in			
0ver 15 Up to 20		2.0	0.0	3 in	0.0	3 in	6.0	3 in	3512	:	i
		14.0	0.0	3 in	9.0	3 in	9.0	3 in			
Over 20			Note(1)								
Footnotes to Notes (1) Se Notes (2), Se Notes (2), Se	tables, and ge e Appendix D v Appendix D stuet manufac	eneral mates of 1, Iten: (g.K.I.) 1, Iten: (g.K.2.) 1, Iten: (g.K.2.) 1, Iten: and/or	dydraulic sh qualified eag	oring, are foun inect for Sectio	d in Appendi n Medulus of	o. I), Item (g) I available wale	vi				

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 Table D-1.4
 Aluminum Hydraulic Shoring Waler Systems For Soil Type C

	₽,/I	a les			Hydrauli	ic Cylinders			Tin	nber Uprig	hts
Depth					Width of 1	French (feet)			MBX.	Horiz. Sp.	acing)
of Trench	Vertical Spacing	Section Medulus	đ	108	Over 8	Up to 12	Over Iž	: Up 10 15	Solid Sheet	2 fi.	3 <i>1</i> 1.
(leel)	(leet)	(in ³)	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter	Horiz. Spacing	Cylinder Diameter			
		3.5	6.0	2 in	6.0	2 in Note(2)	6.0	3 in			
0ver 5 Jp 10 10	4	7.0	6.5	2 in	6.5	2 in Note (2)	6.5	3 in	3×12	1	1
		14.0	10.0	3 in	10.0	3 in	10.0	3 in	,	-	
		3.5	4.0	2 in	4.0	2 in Note(2)	4.0	3 in			
Ver 10 p to 15	4	7.0	5.5	3 in	5.5	3 in	5.5	3 in	3×12	١.	ł
		14.0	8.0	3 in	8.0	3 in	8.0	3 in			
		3.5	3.5	2 in	3.5	2 in Note(2)	3.5	3 in			
ver 15 p to 20	4	7.0	5.0	3 in	5.0	3 in	5.0	3 in	3×12	ł	ł
		14.0	6.0	3 in	6.0	3 in	6.0	3 in			
iver 20			Note(1)].		
tnotes to t es (1): See es (2): See insult proc	ables, and gen Appendix D, Appendix D, luct manufact	neral notes on Item (gX1) Item (gX2) turer and/or q	hydraulic shc ualified engiv	oring, are found neer for Sectior	d in Appendi	x D, Item (g) available wale:	Ś				

Construction Standards

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Subpart P—Excavations

designed by a registered professional engineer in accordance with § 1926.052(b) and (c). Appendix F to \$ 1926 Subpart P-Selection of Protective Systems part $P_{\rm c}$ for excavations 20 feet or less in depth. Protective systems for use in excavations more than 20 feet in Jepth must be The following figures are a graphic sum-mary of the requirements contained in sub-Is the excavation more than 5 feet in deptn? Is there potential for cave-in? is the excavation entirely in stable rock? NO YES Excavation may be made with YES NO vertical sides. Excuvation must be YES NO sloped, shored, or shielded. Shoring or shortling. Sloping setected. selected. Gu to Figure 3 Go to Figure 2

FIGURE 1-PRELIMINARY DECISIONS

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§ 1926.652(bX+) which requires the excavation to be designed by a registered professional engineer.

§ 1926 Subpart P App. F



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APPENDIX B RESPIRATOR FIT TESTING

RESERATOR FIT TEST FORM

This form is used to document the results of a respirator fit test. The wearer must first read the attached zes, which are a copy of the OSHA Qualitative and Quantitative Fit Testing Procedures [Appendix E to 29 FR 1910.1028(Ch. XVII, 7-1-91 Edition, pp. 213-219)]. The guidelines listed below should be followed for the Irritant Smoke and Banana Oil fit testing methods. Use the bottom section of this form to document the respirator fit test results. Give this completed form to the INTERA corporate Health and Safety Officer for placement in your file.

Irritant Smoke

1. The wearer must don a respirator equipped with HEPA (high efficiency) filters.

2. The wearer must close eyes tightly.

3. The tester must bread the ends of the smoke tube and insert one end of the tube into a squeeze bulb. 4. Squeeze the bulb to create a cloud of smoke near the wearer's face. The wearer should perform the

exercises listed below for 60 seconds each. If the wearer coughs, sneezes; or complains of irritation, ry repositioning the facepiece and headband to eliminate the leak.

5. If, in two attempts, the wearer has not stopped the leak, the test has failed and the wearer must try another size.

Banana Oil

I. The wearer must don a respirator equipped with organic vapor cartridges.

2. The tester must crush the ampoule between thumb and forefinger:

B. Hold ampoule approximately 1 to 2 inches from the wearer's face. Pass ampoule around the face seal area and exhalation valve. The wearer should perform the exercises listed below for 60 seconds each.

Leakage will be noted by a 'banana-like' odor in the facepiece.

i, in two attempts, the wearer has not stopped the leak, the test has failed and the wearer must try another size.

FTT TEST RESULTS

Employee (wearer):

Company:

Fit Test Method: Irritant Smoke _____ Banana Oil _____ [†]Other _____

Respirator: Manufacturer & Model No. ______ Size _____

Positive Pressure Test: ______ Negative Pressure Test: _____

- Move Head Up & Down: _____ Move Head Side to Side: _____ Normal Breath: _____

Bend At Waist: _____ Deep Breath: _____ Talk: _____ Grimace: _____

Fit Test Results: Pass _____ Fail _____

Comments:

	· · ·
Employee's Signature:	Date:
ter's Printed Name & Signature:	Date:

If other fit test method is used, describe method including testing substance and cartridges/filters used on the back of this form. "The Employee's signature states that the attached rare pages have been read and the above tests have been completed.

Occupational Safety and Health Admin., Labor

1.1. Detection limit-Bulk Samples

The detection limit for the analytical proordure for bulk samples 15 0.88 µr. with a coindent of variation of 0.019 at this level rais amount provided a chromatographic post that could be identifiable in the presence of possible interferences. The detection Healt date were obtained by making 10 µL miccilons of 1 0.10% by volume standard.

Infaction Area Cours 45386 44214 10822 8-440; Sports 11062 4272 0.019

§ 1910.1028

8.2 Pooled coefficient of variation-Bulk Samples

The pooled conflicient of variation for ansivilal propedure was determined by 50 µL replication jections of analytical standards. The stindards were 0.01, 0.02, 0.04, 0.10, 1.0, 20% benzene by volume. 2 🛹

AREA DOUNT (PERCENT)

kylocion Ho.	0.01	0.02	مەر	0.10	م۱	2.0
	45386 44241 43822 44062 44006	84737 84000 83835 84381 80012	166097 170832 164160 164445 166536	443497 441289 443719 443719 44442 442564	4395380 4550800 4557200 4642350 4642350	9319150 9484900 9557580 9577060 9766240
	42724 440401 8525 0.0194 0.017	81957 87701.6 1042.2 0.0125	173002 167572 15893 0.0213	4(3975 44(149 2458-1 0.0055	4646260 4585767 96829.3 0.0211	9564986 166233 0,0174

ATTENDER E TO \$ 1910.1028-QUALITATIVE IND QUANTILATIVE FTT TESTING PROCEDURES

I. Fit Test Protocols

A The employer shall include the followhe provisions in the fit test procedures. Ince provisions apply to both gualitative fit testing (OLFT) and quantitative fit test A(QNFT)

The test subject shall be allowed to pick most comfortable respirator from a seetten including respirators of various sizes from different manufacturers. The selection chell include at least three sizes of elastomeric facepleces of the type of respirator Cashis to be tested, i.e., three sizes of half nict or three sizes of full facepiece; and mits from at least two manufacturers.

2 Prior to the selection process, the test schleet shall be shown how to put on a respirator, how it should be positioned on the has how to set strap tendon and how to detraine a comfortable fit. A mirror shall be stillable to accist the subject in evaluating the fit and positioning the respirator. This betraction may not constitute the subject's fermal training on respirator use, at it is aly a review.

1. The test subject shall be informed that Whe is being asked to select the respirawhich provides the most comfortable fit. Ach respirator represents a different size and mape, and if fitted and used property. I provide adoquate protection.

4. The test subject shall be instructed to hold each faceplece up to the face and climinate those which obviously do not give a comfortable fit.

5. The more comfortable facepleces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in excessing comfort can be given by discussing the points in item 6 below. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to ajust the straps each time to become adept at setting proper tencion on the straps.

6. Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirators

(a) Position of the mask on the nose.

(b) Room for eye protection.

(c) Room to talk.

(d) Position of mask on face and checks.

7. The following criteria shall be used to help determine the adequacy of the respirator fit

(a) Chin property placed:

(b) Adequate strap tendon, not overly tightened-

(c) Fit across nose bridge (d) Respirator of proper size to span dis-

tance from nose to chin:

(c) Tendency of respirator to slip;



§ 1910.1028

(1) Self-observation in mirror to evaluate fit and respirator position.

& The test subject shall conduct the negative and positive pressure fit checks as described helow or ANSI Z88.2-1980. Before conducting the negative or positive pressure test, the subject shall be told to scat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another faceplece shall be selected and retested if the test subject fails the fit check tests.

(2) <u>Positive pressure lest</u> Close off the exhalation value and exhale gently onto the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the scal. For most respirators this method of leak testing requires the wearer to first remove the exhalation value cover before closing off the exhalation value and then carefully replacing it after the test.

(b) <u>Negative pressure (csf.</u> Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter scal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece scaling surface, such as stubble beard growth, beard, or long sideburns which cross the respirator scaling surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory disease or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

IL The test subject shall be given the opportunity to wear the successfully fitted respirator for a period of two weeks. If at any time during this period the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

12. The employer shall certify that a successful fit test has been administered to the employee. The certification shall include the following information:

(a) Name of employee;

(b) Type, brand and size of respirator, and

(c) Date of test.

Where QNPT is used, the fit factor, strip chart, or other recording of the results of the test, shall be retained with the certification. The certification shall be maintained until the next fit test is administered. 13. Exercise regimen. Prior to the commencement of the lit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worm for at least 5 minutes before the star of the fit test.

14. Test Exercises. The test subject shall perform exercises. In the test environment in the manner described below:

(a) <u>Normal breathing</u>. In a normal stand, ing position, without talking, the subject shall breathe normally.

(b) <u>Deep breathing</u>. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as to not hyperventilate.

(c) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(d) <u>Moving head up and down</u> Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e. when looking toward the celling).

(c) <u>Talking</u>. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the <u>Rainbow Passage</u>, count backward SEC attached from 100, or recite a memorized poem or sene.

(f) Grimace. The test subject shall grimace by smiling or frowning.

(g) <u>Bending over</u>. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT units which prohibit bending at the waist.

(h) Normal breathing. Same as exercise L

Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds.

The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

B. Qualitative Fit Test (QLFT) Protocols. L. General

(a) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator qualitative fit test program.

(b) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid



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he same enclosure

ject shall wear the respi-) minutes before starting

ll don the enclosure stor selected in secrespirator shall be propad equipped with a

y not cat, drink thew gum for 15 -

Tilbiss Model 40 Inhala er is used to spray the enclosure. This y marked to distinains less solution

white is prepared by u saocharia iu 100

bject shall breathe the extended

is increat into the bole sure and the fit test the enclosure using . or the taste thread ٠, same number of ... A LASIC POSTONIS (See B8 through B10

of the scrosol read of is to the test sub- is Il perform the care T : 🛋

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culves. These take ut arch with its and its two couls appar-'b srince There is accord-? put of guid at one oue ever finds 12.7d eching beyond his is is hoking for the 12

a of the minhow.

Stall At the beginning of each exercise, the Second concentration shall be replenished Malilally described in C9.

The less subject shall indicate to the productor if at any time during the fit inter the taske of saccharia is detected.

ATIN If the machania is detocted the fit is deemal insitisfactory and a different res-Fpirator shall be tried

torought. At least two facepioces shall be serotocol. The test subject shall be given the Topportunity to wear them for one choose the one which is more comfortable to

Successful completion of the test pro-toool dual allow the use of the half mask interested respirator in contaminated atmo-repheres up to 10 times the PEL of asbestoe. Pepheres up to 10 times the PEL of asbestos. In other words this protocol may be used to In other words this protocol may be used to be any protocol of actors no higher than ten. "Which any have be conducted if "Which any hair proven be word the skin "There is any hair proven between the skin "The target any have realing surface." "Which is attisfactory fit, then they shall be altered or removed so as to eliminate inter-

altered or removed so as to eliminate inter-ference and allow a satisfactory fit. If a "satisfactory fit is still not attained, the test to subject must use a positive-pressure respira-tion such as powered air-purifying respira-ter facers - supplied air respirator, or self-Decontribut breaching apparetus

E18. If a test subject exhibits difficulty in breathing during the tests, she or be shall be Freiered to a physician trained in respirator discussion pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his du Licitid high 1. · · · · ·

219. Ovalicative fit testing shall be re-period at least every at months.

To addition, because the scaling of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has at

(1) Weight change of 20 pounds or more, (2) Significant facial sciencing in the area C(1be (acepiece acel,

The balance of the second seco

(14) Raconstructive or assentic surgary, 1.1.1

EXS) Any other condition that may interere with facebiers scaling.

David AnD Roordbarping

ACA summary of all test results shall be

maintained in each office for 3 years. The ammary shall include >

(1) Name of Lesi subject.

(2) Dave of initian

(3) Name of Lest cooductor.

tel(4) Respirators selected (indicate manu-(S) Toxing agent facturer, model, size and approval number).

The second secon

B. Fit test

smoke to familiarize the subject with the characteristic odor.

2. The test subject shall properly don the respirator selected as above, and wear it for at least 10 minutes before starting the fit لصد

J. The test conductor shall review this protocol with the test subject before testing.

ventional positive pressure and negative pressure fit checks (see ANSI 228.2 1980). Failure of either there that the 4. The test subject shall perform the conselect an alternate respirator.

5. Break both ends of a ventilation smoke tube containing stannic axychloride, such as the MSA part 15645, or equivalent Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver 200 milliliters per minute.

6. Advise the test subject that the smoke can be initiating to the eyes and instruct the subject to keep the eyes closed while the test is performed.

7. The test conductor shall direct the, stream of irritant smoke from the tube tovards the facescal area of the test subject The person conducting the test shall begin the tube at least 12 inches from the rich facepiece and gradually move to within one inch, moving around the whole perimeter of the mask

8. The test subject shall be instructed to do the following exercises while the respira-tor is being challenged by the smoke. Each exercise shall be performed for one minute.

L Breathe portnally.

IL Breathe deeply. Be certain breaths are deep and regular.

iii. Turn head all the way from one side to the other. Be certain movement is com-plete. Inhale on each side. Do not bump the respirator against the shoulders.

iv Nod head up-and-down. Be certain motions are complete and made every secoud."Inhale when head is in the full up position (looking toward ceiling). Do not bump the respirator against the chest :

v. Talking. Talk aloud and slowly for several minutes. The following paragraph is called the Rainbow Passage. Repeating it after the test conductor (keeping eyes closed) will result in a wide range of facial unvements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used

Rainbow Passage

When the sunlight strikes rulndroos in the sir, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends appar-ently beyond the borizon. There is, accordto legend, a boiling pot of gold at one L People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

VL Jogging in Place

vii. Breathe pormally.

9. The test subject shall indicate to the test conductor if the initiant smoke is detected. If smoke is detected, the test con-ductor shall stop the test. In this case, the tested respirator is rejected and another respirator shall be selected.

10. Each test subject passing the smoke test (i.e. without detecting the smoke) shall be given a sensitivity check of amoke from the same tube to determine if the test subject reacts to the smoke. Failure to evoke a response shall void the fit test.

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11. Sceps B4, B9, B10 of this fit test protocol shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agents.

12. At least two facepieces shall be aclected by the irritant fume test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

13. Respirators successfully tested by the protocol may be used in contaminated atmospheres up to ten times the PEL of asperror

14. The test shall not be conducted if there is any hair growth between the skin and the facepiece scaling surface.

15. If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied air respirator, or self-contained breathing apparature.

16. If a test subject exhibits difficulty in breaching during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear respirator while performing her or his du-

17. Qualitative fit testing shall be repeated at least every six months. 18. In addition, because the scaling of the

respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a: 5 2 1

(1) Weight change of 20 pounds or more,

of the face piece seal,

ple extractions without prothesis, or acquirng dearment.

...

(5) Any other condition that may interfore with facepioce scaling.

A summary of all test results shall be maintained in each office for 3 years. The summary shall include

(2) Dete of testing

(3) NAME of LEST CONDUCTOR.

(4) Respirators selected (indicate manu-facturer, model, size and approval number).

(5) Taxing again

Quantitative Fit Test Procedures

1. General

a. The method applies to the negativepressure nonpowered air-purifying respiraiors only.

b. The employer shall assign one individual who shall assume the full responsibility for implementing the respirator quantitative fit test program.

2. Definition

§1910.1001 App. C

(2) Significant facial scarring in the area

(3) Significant dental changer, Le.; multi-

(4) Reconstructive or cosmestic surgery

C. Rocordkoeping

(1) Name of test subject.

General Industry Standards

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Service Providence

A. TOWARDARINE FR Test" means the measurement of the effectiveness of a return rator seal in excluding the ambient atmosphere. The test is performed by dending the measured concentration of challenge agent in a test mainter by the measured concentration of the challenge agent mulde the respirator facepiece when the normal air purifying element has been replaced by an essentially perfect purifying elements

b. "Challenge Agent" means the air contaminant introduced into a test chamber so that its concentration inside and outside the respirator may be compared.

e. "Test Subject" means the person wearing the respirator for quantitative fit testing.

d. "Normal Standing Position" means standing erect and straight with arms fown along the slogg and looking straight ahead.

c. "Fit Factor" means the ratio of challenge agent concentration outside with respeet to the inside of a respirator inlet covering (facepiece or enclosure).

3. Apparetus

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 Instrumentation. Corn oil. willum chloride er sener appropriate aerosol gener-ation, dilution, and measurement systema shall be used for quantitative fit test."

b. Test enamber. The test chamber shall be large enough to permit all test subjects to freely perform all required exercises without distributing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isslated from the ambient air yet uniform in concentration throughout the chamter.

C. When testing kir-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particu-Lite filter supplied by the same manufacturer.

& The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fail of challenge areas concentration with each inspiration and expiration at fit factors of at least 2 000

e. The combination of substitute air-purifying elements (if apy), challenge agent, and challenge agent concentration in the test chantier shall be such that the test subject is set expand in enters of PEL to the challenge agent at any time during the testing prodess

I. The sampling port on the test specimen respirator shall be placed and constructed so that there is no detectable leak around the part a free air flow is allowed into the sampling line at all times and so there is no interference with the fit or performance of the respirator.

5. The test chamber and test set-up shall permit the person administering the test to disserve one test subject inside the chamber during the test

h. The couldment generating the chal-lenge atmosphere shall maintain the concontration of challenge agent constant within a 10 percent variation for the duration of the sect

L The time lag (interval between an event and its being recorded on the strip chart) of the instrumentation may not excool ? seconde

). The tubing for the test chamber at mospliere and for the repirator sampling port anall be the same diameter, konstn and ma-It shall be hept as another provide The smallest diameter tables, recommended by the manufacturer shall be used

& The exhaust flow from the test chamber shall pass through a high-efficiency filter before release to the room.

l When william chloride kerssol is used, the relative humidity inside the test chamber mall not exceed 50 percent.

A. Procedural Requiremental

a. The fitting of half-mask respirators multi-se started with those having multipre-sizes and a variety of interchangeable cartifizers and canisters such as the Camia II-M, North M, Survivair M, A-O M, or Scott-M. Use either of the tests outlined below to assure that the facepiece is property adjusted.

(1) Pusitive pressure tast. With the exust port(s) blocked, the negative pressure of silenc initialation should remain constant for several seconds.

(2) Negacive pressure test. With the intake port(s) blocked, the negative pressure digné incatation should remain constant for serveral seconds.

b. After a facebiece is adjusted, the test subject shall wear the facepiece for at least S minutes before conducting a qualitative test by using either of the methods de-Articled below and using the exercise regime described in S.a., b., c., d. and c.

(1) Iwanyl acetate test. When using orgame vapor carteidges, the test subject who can smell the ader should be unable to de-tect the ader of issumy! sectate squirted into the air near the must vulnerable portions of the faceblece seal. In a location which is reparated from the fast area, the test subject shall be instructed to close her/ his eyes during the test period. A combination cartridge or canister with organic va-per and high-efficiency filters shall be used stag available for the particular mask being tested. The test subject shall be given an opportunity to smell the ador of isoamy acetate before the test is conducted.

(2) Instance funce task. When using highefficiency filters, the test subject should be multe to detect the odde of initiant forms (stannic chloride or titanium tetrachluride ventilation smoke (ubes) squirted into the air near the most vulnerable portions of the freepiece scal. The test subject shall be in-structed to close her/his eyes during the test peri 🛋

e. The test subject may enter the quantitative testing champer only if the or be bas obtained a matisfactory fit as stated in 4.5. of this Appendix.

d. Before the subject enters the test chamber, a reasonably stable challenge agent concentration shall be measured in the test of ender-

e. Immediately after the subject enters the test chamber, the challenge agent con-contration inside the respirator shall be measured to easure that the peak penetra-tion does not exceed 5 percent for a halfmask and I percent for a full facepiece.

I. A stable diallenge agent concentration shall be obtained prior to the actual start of lasing.

(1) Respirator restraining straps may not te overlightened for testing. The straps shall be adjusted by the wearer to give a reasonably comfortable fit typical of normal 115-

S. Exercise Regime, Prior to entering the test chamber, the test subject shall be given complete instructions as to ber/his per in be test procedures in the other perform the following secretizes, in the other performs the following secretizes, in the other performances the test of the other performances and the other performances are the other performances and the other performances are the

performance independent and a state of a state of the second state THE REAL PROPERTY IN

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moute. 5 Breaching (D). In the normal structure position the subject shall do deep structure these we minute penning for a bare constitute. 12 not to hyperventiliste.

C Turning head side to side (CS). Stand-3 c luming near not not not not not not in ing in place the subject shall slowly turn we have here head from side between the caterone positions to each side. The head shall be held at each extreme position for at least 5 woonds. Perform for at least three complete creter

i slowing bead up and down (UD). Standing in place, the subject shall showly the the extreme position straight up and the estreme publica straight down. The bead stateme president activation of the local shall be beid at each extreme position for at heast 5 seconds. Perform for at least three

complete cycles. a Raiding (R). The test subject (Leopler cyce desed) shall repeat after the test on cutor the 'raidbox pattage' at the end of the ordina. The subject shall take short this section. The subject shall talk slowly the and aloud so as to be beard clearly by the test conductor of manitor.

L. Grimace (G). The test subject shall have primace, smile, frown, and ponerally contart of the face using the facial muscler. Continue of the face at least 15 seconds.

5. Send over and which was (B). The weet # subject shall bend at the waist and teach we and recurs to upright partition Report \$ for it least 20 monde 1000

a. Jogging in place (J). The test subject states and the states of the state of the states of the st

Provide a second of the second light into many besutile before. There take the mentance of a barg round arch, with the second path high above, and its (we ends applied ently beyond the buriase. There is, accord muy beyond the avoid of gold at one states ing to keyond, a building pix of gold at one states only Pouple work, but no one ever finds it. When a man build for wheething beyond states much, his friends say be is looking for the the pot of good at the and of the rainform, which are

6. The test shall be terminated whenever any single peak penetration exceeds 5 perinterpieces. The test subject may be relited and retested. If two of the three required tests are terminated, the fit shall be deemed -Lindogune ليغير المدر .

ر سایت میں درور باری میں 7. Calculation of Fit Factors. 1990 N a. The fit lacar determined by the quant for the start of the start of

b. The average test charitier concentra-tion is the arithmetic average of the test chamber concentration at the beginning and of the end of the test.

a The average peak concentration of the challenge agent inside the respirator shall be the initiancie iverige park association

§1910.1001 App. C

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APPENDIX C Material Safety Data Sheets MSDSs



Compliance Today and Beyond

First Aid Measures Personal Protection Handling/Storage

Fire Fighting Measures **Chemical Ingredients**

Manufacturer/Responsible Party Physical-Chemical Properites Accidental Release Measures HAZCOM Label

Product Identification

Product ID: DIESEL FUEL MSDS Date: 12/12/1993 Tech Review: 12/25/1994 FSC: 9140 NIIN: 00-000-0185 LIIN: MSDS Number: 154825 Submitter: D DG Status Cd: C **MFN:** 01 Article: N Kit Part: N

Manufacturer-Responsible Party

Company Name: MOBIL OIL CORP Address: 3225 GALLONS ROAD Box: N/K City: FAIRFAX State: VA ZIP: 22037-0001 Country: US Info Phone Num: 800-662-4525/800-227-0707 X3265 Emergency Phone Num: 609-737-4411/CHEMTREC 800-424-9300 **Resp. Party Other MSDS Num.:** Preparer's Name: N/P **Chemtrec Ind/Phone: Proprietary Ind:** N **Review Ind:** Y **Published:** Y **CAGE: 3U728** Special Project Cd: N

Contractor Identification

Company Name: MOBIL OIL CORP Address: 3225 GALLOWS ROAD Box: City: FAIRFAX State: VA ZIP: 22037 Country: US Phone: 800-662-4525 **Contract Num: CAGE: 3U728**

DIESEL FUEL : MOBIL OIL CORP

Item Description Information

Item Name: USED TO BE 26648 Item Manager: NK Specification Num: NK Type/Grade/Class: NK Unit of Issue: GL Quantitative Expression: NK UI Container Qty: NK Type of Container:

CHEMICAL INGREDIENTS

Ingred Name: NO. 2 DIESEL FUEL CAS: 68334-30-5 Cd: M RTECS #: HZ1800000 Cd: M **= Wt:** Cd: = Vol: Cd: > Wt: Cd: >Vol: Cd: < Wt: Cd: <Vol: Cd: % Low Wt: Cd: % High Wt: Cd: % Low Vol: Cd: % High Vol: Cd: % Text: 100 **Environmental Wt: Other REC Limits: NONE RECOMMENDED OSHA PEL:** NOT ESTABLISHED Cd: M **OSHA STEL:** Cd: ACGIH TLV: NOT ESTABLISHED Cd: M ACGIH STEL: N/P Cd: **EPA Rpt Qty: DOT Rpt Oty: Ozone Depleting Chemical:** N

Hazards Identification

LD50 LC50 Mixture : ORAL LD50 (RAT) IS >2000 MG/KG Route of Entry Inds -Inhalation: YES Skin: YES Ingestion: YES Carcinogenicity Inds -NTP: NO IARC: NO OSHA: NO Health Hazards Acute and Chronic PRODUCT IS MILDLY IRRITATING TO BODY TISSUES. BREATHING VAPORS MAY PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION, AND PROLONGED AND/OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

Explanation of Carcinogenicity

THE COMPONENTS OF THIS PRODUCT HAVE NOT SHOWN ANY EVIDENCE OF BEING CARCINOGENIC.

Signs and Symptions of Overexposure

EYE:IRRITATION, SKIN:MILD IRRITATION, POSSIBLE DERMATITIS WITH PROLONGED/REPEATED CONTACT. INHALED:RESPIRATORY IRRITATION, NAUSEA, DIZZINESS, HEADACHE. ASPIRATION OF LIQUID INTO LUNGS MAY CAUSE CHEMICAL PNEUMONIA. INGESTED:G/I IRRITTATION, NAUSEA, VOMITIN.

Medical Cond Aggravated by Exposure

NONE SPECIFIED BY MANUFACTURER.

First Aid Measures

First Aid

EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN. SKIN:WASH WITH SOAP & WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE. INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY. INGESTED:DO NOT INDUCE VOMITING. GIVE 11 TO 2 OF WA TER AND GET IMEDIATE MEDICAL CARE. GIVE NOTHING BY MOUTH IF UNCONSCIOUS. IF IRRITATION PERSISTS OR IS SEVERE,SEE A DOCTOR.

Accidental Release Measures

Spill Release Procedures

ELIMINATE SOURCES OF IGNITION. MINOR: ABSORB MATERIAL WITH CLAY, VERMICULITE, OR SIMILAR ABSORBENT MATERIAL. PLACE IN DISPOSAL CONTAINERS. MAJOR: DIKE & CONTAIN SPILL. SHUT OFF LEAKS. RECOVER LIQUID FOR RECLAIM. ABSORB REMAINDDER FOR DISPOSA L. Neutralizing Agent NOT APPLICABLE

Disposal Considerations

Waste Disposal Methods

DISPOSE I/A/W ALL FEDERAL, STATE AND LOCAL REGULATIONS. MANUFACTURER SUGGESTS THAT DISPOSAL MAY BE DONE BY INCINERATION.

Handling and Storage

Handling and Storage Precautions

STORE IN FLAMMABLE/COMBUSTIBLE LIQUIDS AREA. KEEP CONTAINERS CLOSED WHEN NOT IN USE.

Other Precautions

'EMPTY' CONTAINERS MAY CONTAIN RESIDUE OR VAPOR. TREATTHEM WITH THE RESPECT DUE FULL ONES. DO NOT CUT,WELD,ETC. ON THEM. GROUNDCONTAINERS

BEFORE TRANSFERRING LIQUID. AVOID HAVING OPEN ELECTRICALEQUIPMENT IN VAPOR AREAS.

Fire Fighting Measures

Flash Point Method: PMCC Flash Point: Flash Point Text: >125F,>52C Autoignition Temp: Autoignition Temp Text: N/A Lower Limits: 0.6 Upper Limits: 7.0 Extinguishing Media USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL. Fire Fighting Procedures WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY. PREVENT RUNOFF. Unusual Fire/Explosion Hazard COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS. USE SCBA GEAR.

Personal Protection

Respiratory Protection

RESPIRATOR WILL NOT NORMALLY BE NECESSARY. USE NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR OR RESPIRATOR FOR ORGANIC VAPOR IF EXPOSURE IS ABOVE THE TLV/PEL. SEE 29 CFR 1910.134 FOR REGULATIONS PERTAINING TO RESPIRATOR USE.

Ventilation

USE EXPLOSION PROOF LOCAL AND MECHANICAL EXHAUST TO MAINTAIN EXPOSURES BELOW PEL/TLV. Protective Gloves NEOPRENE, OR OTHER IMPERVIOUS Eye Protection USE CHEMICAL SAFETY GOGGLES & FACESHIELD Other Protective Equipment

AMERADA HESS -- REGULAR UNLEADED GASOLINE

MATERIAL SAFETY DATA SHEET

Manufacturer's CAGE: 4N717						
Part No. Indicator: A						
Part Number/Trade Name: REGULAR UNLEADED GASOLINE						
General Information						
Company's Name: AMERADA HESS CORP						
Company's Street: 1 HESS PLAZA						
Company's City: WOODBRIDGE						
Company's State: NJ						
Company's Country: US						
Company's Zip Code: 07095						
Company's Emerg Ph #: 800-424-9300(CHEMTREC)						
Company's Info Ph #: 201-750-6000						
Record No. For Safety Entry: 001						
Tot Safety Entries This Stk#: 001						
Status: SMJ						
Date MSDS Prepared: 13JAN89						
Safety Data Review Date: 08JAN92						
MSDS Serial Number: BLZXH						

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Ingredients/Identity Information

Proprietary: NO

Ingredient: GASOLINE

Ingredient Sequence Number: 01

Percent: 100

NIOSH (RTECS) Number: LX3300000

CAS Number: 8006-61-9

OSHA PEL: 300 PPM;500 PPM STEL

ACGIH TLV: 300 PPM;500 PPM STEL

Proprietary: NO

Ingredient: TERT-AMYL METHYL ETHER (BLEND OF ING 2&3 FOR A TOTAL OF 15% OF PRODUCT)

Ingredient Sequence Number: 02

Percent: MIX

NIOSH (RTECS) Number: 1007422AM

CAS Number: 994-05-8

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ETHER, TERT-BUTYL METHYL; (METHYL TERT-BUTYL ETHER)

Ingredient Sequence Number: 03

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Percent: MIX

NIOSH (RTECS) Number: KNS525000

CAS Number: 1634-04-4

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: TOLUENE

Ingredient Sequence Number: 04

Percent: 6-<3015

NIOSH (RTECS) Number: XS5250000

CAS Number: 108-88-3

OSHA PEL: 200 PPM/150 STEL

ACGIH TLV: 50 PPM; 9293

Proprietary: NO

Ingredient: XYLENE

Ingredient Sequence Number: 05

Percent: 8.5-<15

NIOSH (RTECS) Number: ZE2100000

CAS Number: 1330-20-7

OSHA PEL: 100 PPM;150 PPM STEL

ACGIH TLV: 100 PPM;150 PPM STE

Proprietary: NO

Ingredient: BENZENE

Ingredient Sequence Number: 06

Percent: 0.1-<5

NIOSH (RTECS) Number: CY1400000

CAS Number: 71-43-2

OSHA PEL: 1 PPM; 5 STEL (MFR)

ACGIH TLV: 10 PPM

Proprietary: NO

Ingredient: BENZENE, ETHYL; (ETHYL BENZENE)

Ingredient Sequence Number: 07

Percent: <3

NIOSH (RTECS) Number: DA0700000

CAS Number: 100-41-4

OSHA PEL: 100 PPM;125 PPM STEL

ACGIH TLV: 100 PPM;125 PPM STEL

Proprietary: NO

Ingredient: BENZENE, 1, 2, 4-TRIMETHYL-; (1, 2, 4-TRIMETHYLBENZENE)

Ingredient Sequence Number: 08

NIOSH (RTECS) Number: DC3325000

CAS Number: 95-63-6

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

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Proprietary: NO

Ingredient: SUPPORT DATA:IN AIR. HEAVIER/AIR VAPOR CAN FLOW ALONG SURFACES TO DISTANT SOURCES OF IGNITION AND FLASHBACK. FLOW GASOLINE CAN BE (ING 10)

Ingredient Sequence Number: 09

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 9:IGNITED BY SELF-GENERATED STATIC ELECTRICITY RUNOFF TO SEWERS MAY CREATE FIRE &/OR EXPLOSION HAZARD

Ingredient Sequence Number: 10

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: EFFECTS OF OVEREXPOSURE: WILL FATIGUE OLFACTORY SENSES. IMMEDIATELY DANGEROUS TO HEALTH/LIFE IS REPRESENTED BY 2 THOUSANDS(2000) PPM. (ING 12)

Ingredient Sequence Number: 11

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 11:INGESTION/INHALATION OF LIQUID &/OR EXCESS VAPOR CANHAVE

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09/08/2001

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AN ANESTHETIZING EFFECT, CAUSING VERTIGO, BLURRED VISION, VOMIT & (ING 13)

Ingredient Sequence Number: 12

NIOSH (RTECS) Number: 9999992Z

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 12:CYANOSIS. OVEREXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION.

Ingredient Sequence Number: 13

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: SPILL PROCEDURES :ACQUATIC LIFE. CAUTION-EVACUATE ALL NON-ESSENTIAL PERSONNEL SPILLED MATERIAL MAY CAUSE SLIPPERY CONDITION. OPEN (ING 15)

Ingredient Sequence Number: 14

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 14:SPILLS MAY EMIT FLAMMABLE VAPOR APPROACH FROM UPWIND IF POSSIBLE. AVOID BREATHING EMITTED VAPOR WEAR SCBA IF REQUIRED TO PREVENT (ING 16)

http://omega.cc.umb.edu/~ehs/unleadmsds.htm

Ingredient Sequence Number: 15

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICÁBLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 15:INHAL OF VAPORS.

Ingredient Sequence Number: 16

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: WASTE DISPOSAL METHOD:FLAMMABLE, VAPORS.

Ingredient Sequence Number: 17

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: HANDLING/STORAGE PRECAUTIONS :BONDED/GROUNDED TO PREVENT POTENTIAL ACCUMULATION OF STATIC ELECTRICITY. NO SMOKING IN AREAS OF HANDLING/STORAGE (ING 19)

Ingredient Sequence Number: 18

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 18:STORAGE SHOULD BE TIGHTLY CLOSED CONTAINER IN COOL/DRY/ISOLATED & WELL VENTED AREA AWAY FROM POTENTIAL SOURCES OF IGNITION.

Ingredient Sequence Number: 19

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: OTHER PRECAUTIONS :REGULAR/FREQUENT BASIS. VENTALATION MUST BE SUFFICIENT TO PREVENT ACCUMULATION OF TOXIC/FLAMMABLE CONCENTRATION OF VAPOR IN AIR. (ING 21)

Ingredient Sequence Number: 20

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: ING 20:EMPTY CONTAINER MAY CONTAIN TOXIC/FLAM/MABLE COMBUSTION RESIDUE/VAPOR. DO NOT CUT/GRIND/DRILL/WELD OR REUSE CONTAINER UNLESS ADEQUATE (ING 22)

Ingredient Sequence Number: 21

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

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UNLEADED GASOLINE MSDS

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Proprietary: NO

Ingredient: ING 21:PRECAUTIONS AGAINST THESE HAZARDS ARE TAKEN.

Ingredient Sequence Number: 22

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Proprietary: NO

Ingredient: HYGIENE PRACTICES: UPPWIND OF VAPOR OR MIST RELEASE, SPILL OR 'LEAK.

Ingredient Sequence Number: 23

NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE

ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: CLEAR LIQUID W/STRONG AROMATIC HYDROCARBON ODOR. MAY BE DYED CHARACTERISTIC(SUPDAT)

Boiling Point: 85.0F,29.4C

Vapor Pressure (MM Hg/70 F): SUPP DATA

Vapor Density (Air=1): 3.0-4.0

Specific Gravity: 0.76

Evaporation Rate And Ref: 10-11(BUTYL ACETATE=1)

http://omega.cc.umb.edu/~ehs/unleadmsds.htm

Solubility In Water: SLIGHT

Percent Volatiles By Volume: 100

Fire and Explosion Hazard Data

Flash Point: -40F,-40C

Flash Point Method: TCC

Lower Explosive Limit: 1.4%

Upper Explosive Limit: 7.4%

Extinguishing Media: ANY APPROVED EXTINGUISHING AGENT FOR CLASS B FIRES/DRY CHEM/FOAM/CO*2 OR HALON. H*20 IS NOT ORDINARILY EFFECTIVE HOWEVER, H*20 FOG(SUPP DATA)

Special Fire Fighting Proc: NIOSH/MSHA APPRVD SCBA & FULL PROTECTION EQUIPMENT (FPN). AVOID INHALATION OF VAPOR. H*20 SHOULD BE USED TO KEEP EXPOSURE CONTROL COOL. APPROACH FROM UPWIND IF POSSIBLE.

Unusual Fire And Expl Hazrds: CLASS 1A FLAMMABLE LIQUID. KEEP AWAY FROM HEAT/SOURCES OF IGNITION/OXIDIZERS. BURN MAY CAUSE EMISSION OF TOXIC PRODUCTION OF COMBUSTION.

EMPTY PRODUCT CONTROL/VESSELS MAY CONTAIN (SUPP DATA)

Reactivity Data

Stability: YES

Cond To Avoid (Stability): AVOID HANDLING OR STORING NEAR HEAT, SPARKS OR

OPEN FLAME.

Materials To Avoid: OXIDIZING AGENTS. COMBUSTION OF NITRIC AND SULFURIC

ACIDS.

Hazardous Decomp Products: CONTACT W/NITRIC & SULFURIC ACIDS WILL FORM
NITROCRESOLS THAT CAN DECOMPOSE VIOLENTLY.

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT.

Health Hazard Data

LD50-LC50 Mixture: LD50:ORAL(RBT)5 ML/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: ACUTE/CHRONIC:HARMFUL/FATAL IF SWALLOW/

ASPIRATED. LONG TERM EXPOS TO VAP HAS CAUSED CANCER IN SOME LAB ANIMALS. INGEST MAY CAUSE GI DISTURB. ASPIR INTO LUNGS MAY CAUSE PNEUMONIA PROLONGED CONTACT W/SKIN MAY RESULT IN DEFAT/RED/ITCH/INFLAM/CRACK & POSS SECONDARY INFECTION.

HAS LOW ORDER OF ACUTE ORAL TOXICITY IF (EFFECTS OF OVEREXPOSURE)

Carcinogenicity - NTP: YES

Carcinogenicity - IARC: YES

Carcinogenicity - OSHA: YES

Explanation Carcinogenicity: GASOLINE - IARC 2B; BENZENE, A CONSTITUENT OF

GASOLINE:OSHA REGULATED, GROUP 1 (IARC,NTP).

Signs/Symptoms Of Overexp: HEALTH HAZARD :INGESTED, BUT MINIMUM AMOUNT ASPIR DURING SUCH INGEST MAY CAUSE DEATH. HIGH PRESS SKIN INJECTIONS ARE SERIOUS MEDICAL EMERGENCY REPEATED/PROLONGED EXPOSURE TO VAPOR CONTAIN HIGH CONCENTRATION OF BENZENE MAY CAUSE ANEMIA &

OTHER BLOOD DISEASES, INCLUDING LEUKEMIA. INHALATION TO 100PPM MAY CAUSE SLIGHT DROWSINESS/HEADACHE. 100-200PPM MAY CAUSE FATIGUE/NAUSEA/ITCH & (ING 11)

Medical Conditions Aggravated By Exposure: OPEN WOUNDS, SKIN DISORDERS, CHRONIC RESPIRATORY DISEASE OR PRE-EXISTING CENTRAL NERVOUS SYSTEM DISEASE.

UNLEADED GASOLINE MSDS

Emergency/First Aid Proc: INHALATION :REMOVE TO FRESH AIR, PROVIDE O*2 THERAPY &/OR RESUSCITATION AS INDICATED. SKIN: REMOVE CONTAMINATED CLOTHING AND FLUSH WITH SOAP AND WATER. EYE: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. INGEST: RINSE MOUTH WITH WATER. KEEP CALM AND WARM. DO NOT INDUCE VOMIT! ASPIRATION OF MATERIAL INTO LUNGS MAY CAUSE CHEMICAL PNEUMONIA. CALL PHYSICIAN IMMEDIATELY

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: CONTAIN ALL SPILLS. ABSORB ALL FREE LIQUID. REMOVE ALL IGNITION SOURCES/SAFELY STOP FLOW OF SPILL. PREVENT FROM ENTER ALL BODIES OF H*20. COMPLY W/ALL APPLICABLE LAWS/REGS. ABSORBENT MATERIAL/PADS/SAND/EARTH MAY BE USED. CONTAMINATED H*20/SOIL MAY BE HAZARD TO ANIMAL/ (ING 14)

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSE OF PRODUCT/CONTAMINATED MATERIAL AS EPA "IGNITABLE HAZARDOUS WASTE". USE ONLY APPROVED TREATMENT TRANSPORTERS & DISPOSAL SITES IN COMPLIANCE W/ALL APPLICABLE FEDERAL/STATE/LOCAL REGULATIONS MAINTAIN SURVEILLANCE OF ABSORBED MATERIAL UNTIL FINAL DISPOSAL TO OBSERVE FOR EMISSION OF VOLATILE, (ING 17)

Precautions-Handling/Storing: KEEP AWAY FROM HEAT/SPARKS/OPEN FLAME. AVOID

BREATHING VAPOR/MIST. AVOID SKIN/EYE CONTACT. KEEP CONTAINER CLOSED & PLAINLY LABELED.

TRANSFER LINES MUST BE (ING 17)

Other Precautions: USE ONLY AS MOTOR FUEL. HANDLE/TRANSPORT/STORE IN ACCORDANCE W/APPLICABLE LAWS/REGULAITONS. ELECTRICAL EQUIPMENT SHOULD BE APPROVED FOR CLASSIFIED AREA. REMOVE SOILED CLTHG/LAUNDER BEFORE RE-USE. DISCARD OIL SOAKED SHOES. WEAR FULL

LENGTH CLOTHING/LAUNDER ON (ING 18)

Control Measures

Respiratory Protection: USE NIOSH/MSHA APPROVED SCBA IN CONFINED SPACES OR

WHEN EXPOSED TO HEAVY MIST.

http://omega.cc.umb.edu/~ehs/unleadmsds.htm

UNLEADED GASOLINE MSDS

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Ventilation: LOCAL EXHAUST:GENERALLY NOT REQUIRED. MECHANICAL (GENERAL): EXPLOSION PROOF(APPROVED FOR CLASSIFIED AREA).

Protective Gloves: IMERVIOUS GLOVES.

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: IMPERVIOUS CLOTHING, EYEWASH/BATH.

Work Hygienic Practices: WASH SKIN THOROUGHLY W/SOAP/H*20 BEFORE EAT/DRINK/SMOKING. VENTILATION MAY BE USED TO CONTROL/REDUCE AIRBORNE CONCENTRATIONS STAND (ING 23)

Suppl. Safety & Health Data: VP: 275-475@68F. APPEAR/ODOR:COLOR FOR

IDENTIFICATION(CLEAR RED/BRONZE/YELLOW ARE TYPICAL). EXTINGUISHING MEDIA:MAY BE USED BY EXPERIENCED FIRE FIGHTER FOR INTENSITY CONTROL/TO COOL EXPOSED AREAS.

EXPLOSION HAZARD:EXPLOSIVE VAPOR DO NOT PRESSURIZE/CUT/HEAT/WELD/EXPOSE SUCH CONTROL OR VESSELS TO SOURCES OF IGNITION. VAPOR CAN READILY FORM EXPLOSIVE MIXTURE(ING 9)

Transportation Data

Trans Data Review Date: 92072

DOT PSN Code: GTN

DOT Proper Shipping Name: GASOLINE

DOT Class: 3

DOT ID Number: UN1203

DOT Pack Group: II

DOT Label: FLAMMABLE LIQUID

IMO PSN Code: HRV

IMO Proper Shipping Name: GASOLINE

IMO Regulations Page Number: 3141

UNLEADED GASOLINE MSDS

IMO UN Number: 1203

IMO UN Class: 3.1

IMO Subsidiary Risk Label: -

IATA PSN Code: RMF

IATA UN ID Number: 1203

IATA Proper Shipping Name: MOTOR SPIRIT

IATA UN Class: 3

IATA Label: FLAMMABLE LIQUID

AFI PSN Code: MUC

AFI Prop. Shipping Name: GASOLINE

AFI Class: 3

AFI ID Number: UN1203

AFI Pack Group: II

AFI Basic Pac Ref: 7-7

Disposal Data

Label Data

Label Required: YES

Label Status: G

Common Name: REGULAR UNLEADED GASOLINE

Special Hazard Precautions: ACUTE/CHRONIC:HARMFUL/FATAL IF SWALLOW/

ASPIRATED. LONG TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN SOME LAB

ANIMALS. INGESTION MAY CAUSE GI DISTURBANCE. ASPIRATE INTO LUNGS MAY CAUSE PNEUMONIA PROLONG CONTACT W/SKIN MAY RESULT IN DEFAT/RED/ITCH/INFLAM/CRACK & POSSIBLY SECONDARY INFECTION.

HAS LOW ORDER OF ACUTE ORAL TOXICITY IF (EFFECTS OF OVEREXPOSURE) HEALTH HAZARD: INGESTED, BUT MINIMUM AMOUNT ASPIRATED DURING SUCH INGEST MAY CAUSE DEATH. HIGH PRESS SKIN INJECTIONS ARE SERIOUS MEDICAL EMERGENCOES REPEATED/PROLONGED EXPOSURE TO VAPOR CONTAINING HIGH CONCENTRATION OF BENZENE MAY CAUSE ANEMIA & OTHER BLOOD DISEASES, INCLUDING LEUKEMIA. INHALATION TO 100PPM MAY CAUSE SLIGHT DROWSINESS/HEADACHE. 100-200PPM MAY CAUSE FATIGUE/NAUSEA/ ITCH & (ING 11)

Label Name: AMERADA HESS CORP

Label Street: 1 HESS PLAZA

Label City: WOODBRIDGE

Label State: NJ

Label Zip Code: 07095

Label Country: US

Label Emergency Number: 00-424-9300(CHEMTREC)



UNIVERSITY OF MASSACHUSETTS BOSTON









MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas: Oxygen 0-23.5%; Isobutylene, 0.0005-0.9%

SYNONYMS: Not Applicable CHEMICAL FAMILY NAME: Not Applicable FORMULA: Not Applicable Document Number: 50054

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

PRODUCT USE:

SUPPLIER/MANUFACTURER'S NAME: ADDRESS:

Calibration of Monitoring and Research Equipment AIR LIQUIDE AMERICA CORPORATION 821 Chesapeake Drive Cambridge, MD 21613 CHEMTREC: 1-800-424-9300 1-410-228-6400

EMERGENCY PHONE:

BUSINESS PHONE:

General MSDS Information 1-713/868-0440 Fax on Demand: 1-800/231-1366

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH OSHA		I			
			TLV	STEL	PEL	STEL	IDLH	OTHER
			ppm	ppm	ppm	ppm	ppm	
Oxygen	7782-44-7	0 - 23.5%	There are no	specific exp	osure limits	for Oxygen.		
Isobutylene	115-11-7	0.0005 - 0.9%	There are no specific exposure limits for Isobutylene.					
Nitrogen	7727-37-9	Balance	There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					

NE = Not Established.

Dished. C = Ceiling Limit.

See Section 16 for Definitions of Terms Used.

NOTE : All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless gas. Releases of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated. Isobutylene, a component of this gas mixture, may cause drowsiness and other central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use. The chief health hazard associated with this gas mixture is when this product contains less than 19.5% Oxygen and is released in a small, poorly-ventilated area (i.e. an enclosed or confined space). Under this circumstance, an oxygen-deficient Individuals breathing such an environment may occur. symptoms which include atmosphere may experience dizziness, drowsiness. headaches. ringing in ears, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The effects associated with various levels of oxygen are as follows:

HAZ	ARDOUS MATER SYST	IAL INFORMATION EM	1	
HEAL	HEALTH (BLUE)			
FLAN	FLAMMABILITY (RED) 0			
[l		·	
PROTECTIVE EQUIPMENT B				
EYES RESPIRATORY HANDS BODY				
See Section 8				
For routine industrial applications				

12-16% Oxygen:Breathing and pulse rate
increase, muscular coor-
dination slightly disturbed.10-14% Oxygen:Emotional upset, abnormal
fatigue, disturbed respiration.6-10% Oxygen:Nausea, vomiting, collapse, or
loss of consciousness.

CONCENTRATION OF OXYGEN

Below 6%:

Convulsive movements, possible respiratory collapse, and death.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

OBSERVED EFFECT

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. The most significant hazard associated with this gas mixture when it contains less than 19.5% oxygen is the potential for exposure to oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, ringing in ears, headaches, shortness of breath, wheezing, headache, dizziness, indigestion, nausea, unconsciousness, and death. The skin of a victim of over-exposure may have a blue color. Additionally, Isobutylene, a component of this gas mixture, may cause drowsiness or central nervous system effects in high concentrations; however, due to its low concentration in this gas mixture, this is unlikely to occur.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to this gas mixture.

TARGET ORGANS: Respiratory system.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn.

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air as quickly as possible. Only trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation if necessary.

4. FIRST-AID MEASURES (Continued)

Victim(s) who experience any adverse effect after over-exposure to this product must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

FLASH POINT, (method): Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not applicable. Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not sensitive. Explosion Sensitivity to Static Discharge: Not sensitive.



SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen. Oxygen levels must be above 19.5% before non-emergency personnel are allowed to reenter area.

If leaking incidentally from the cylinder, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly-ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify cylinders containing this gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C; 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage.

Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

NON-FLAMMABLE GAS MIXTURE MSDS - 50054

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of oxygen.

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if oxygen levels are below 19.5% or unknown during emergency response to a release of this product. If respiratory protection is required for emergency response to this product, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Safety glasses.

HAND PROTECTION: No special protection is needed under normal circumstances of use.

BODY PROTECTION: No special protection is needed under normal circumstances of use.

9. PHYSICAL and CHEMICAL PROPERTIES

Unless otherwise specified, the following information is for Nitrogen, the main component of this gas mixture.

GAS DENSITY @ 32°F (0°C) and 1 atm: 0.072 lbs/ ft³ (1.153 kg/m³)

BOILING POINT: -195.8°C (-320.4 °F)

ODOR THRESHOLD: Not applicable.

FREEZING/MELTING POINT @ 10 psig -210°C (-345.8°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

pH: Not applicable.

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

EVAPORATION RATE (nBuAc = 1): Not applicable.

3 MOLECULAR WEIGHT: 28.01 EXPANSION RATIO: Not applicable. SPECIFIC VOLUME (ft³/lb): 13.8

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

The following information is for this gas mixture.

APPEARANCE AND COLOR: This product is a coloriess, odorless gas.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product.

10. STABILITY and REACTIVITY

STABILITY: Normally stable in gaseous state.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Isobutylene include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. A component of this product (Isobutylene) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

NITROGEN: There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment. **ISOBUTYLENE:** LC_{50} (inhalation, rat) = 620,000 mg/kg/4 hours LC_{50} (inhalation, mouse) = 415,000 mg/kg

EFFECTIVE DATE: MARCH 10, 2000

11. TOXICOLOGICAL INFORMATION (Continued)

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Not applicable.

SENSITIZATION TO THE PRODUCT: This gas mixture is not known to cause sensitization in humans.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for this gas mixture.

Embryotoxcity: No embryotoxic effects have been described for this gas mixture.

Teratogenicity: No teratogenicity effects have been described for this gas mixture.

<u>Reproductive Toxicity</u>: No reproductive toxicity effects have been described for gas mixture.

A <u>mutagen</u> is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An <u>embryotoxin</u> is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A <u>teratogen</u> is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A <u>reproductive toxin</u> is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by over-exposure to the components of this product.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen, if necessary; treat symptoms; eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for the components of this gas mixture.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas. The following environmental data are applicable to the components of this product.

OXYGEN: Water Solubility = 1 volume Oxygen/32 volumes water at 20°C. Log Kow = -0.65

NITROGEN: Water Solubility = 2.4 volumes Nitrogen/100 volumes water at 0°C. 1.6 volumes Nitrogen/100 volumes water at 20°C.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plant and animal life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information).

14. TRANSPORTATION INFORMATION

 THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

 PROPER SHIPPING NAME:
 Compressed gases, n.o.s. (Nitrogen, Oxygen)

 HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)
 UN IDENTIFICATION NUMBER:

 UN IDENTIFICATION NUMBER:
 UN 1956

 PACKING GROUP:
 Not applicable.

 DOT LABEL(S) REQUIRED:
 Non-Flammable Gas

 NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (1996): 126

 MARINE POL LUTANT:
 The components of this gas mixture are not classified by the DOT as Marine Pollutants

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

NON-FLAMMABLE GAS MIXTURE MSDS - 50054

14. TRANSPORTATION INFORMATION (Continued)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (overpack). Pertinent shipping information goes on the outside of the overpack. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS CONSIDERED AS DANGEROUS GOODS. Use the above information for the preparation of Canadian Shipments.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: This product is subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302	SARA 304	SARA 313
Oxygen	NO	NO	NO
Nitrogen	NO	NO	NO
Isobutylene	NO	NO	NO

SARA THRESHOLD PLANNING QUANTITY: Not applicable.

TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER U.S. FEDERAL REGULATIONS:

- No component of this product is subject to the requirements of CFR 29 1910.1000 (under the 1989 PELs).
- Isobutylene is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 pounds.
- The regulations of the Process Safety Management of Highly Hazardous Chemicals are not applicable (29 CFR 1910.119).
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Isobutylene is listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,553 kg) or greater.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Class A, as per the Controlled Product Regulations.

STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

- Alaska Designated Toxic and Hazardous Substances: No.
- California Permissible Exposure Limits for Chemical Contaminants:
- Nitrogen. Florida - Substance List: Oxygen,
- Isobutylene.
- Illinois Toxic Substance List: No. Kansas - Section 302/313 List: No.

Massachusetts - Substance List:

Oxygen, Isobutylene.

- Michigan Critical Materials Register: No. Minnesota - List of Hazardous Substances: No. Missouri - Employer Information/Toxic Substance List: No. New Jersey - Right to Know Hazardous Substance List: Oxygen, Nitrogen, Isobutylene.
- North Dakota List of Hazardous Chemicals, Reportable Quantities: No.
- Pennsylvania Hazardous Substance List: Oxygen, Nitrogen, Isobutylene. Rhode Island - Hazardous Substance

List: Oxygen, Nitrogen, Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: : No.

CALIFORNIA PROPOSITION 65: No component of this product is on the California Proposition 65 lists.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

^o DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. Air Liquide America will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 AV-1 "Safe Handling of Compressed Gases in Containers" "Safe Handling and Storage of Compressed Gases" "Handbook of Compressed Gases"

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc. 9163 Chesapeake Drive, San Diego, CA 92123-1002 619/565-0302

Fax on Demand: ____1-800/231-1366



This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

Baxter Healthcare Corporation **Burdick & Jackson Division** 1953 South Harvey Street Muskegon, MI 49442 USA information/emergency telephone no. 616.726.3171 MATERIAL SAFETY 800.424.9300 chemtrec telephone no. DATA SHEET 613.996.6666 canadian emergency telephone no. I. Identification METHANOL _ molecular weight _32.04 Methanol chemical name Alcohol CH₁O formula chemical family ____ Carbinol, Methyl Alcohol, Wood Alcohol synonyms _____ DOT proper shipping name _____ Methyl Alcohol or Methanol Flammable Liquid DOT hazard class ____ DOT identification no. UN1230 CAS no. 67-56-1 II. Physical and Chemical Data -97.7°C (BuAc=1) ca 5 64.7°C boiling point, 760mm Ha. _ freezing point ____ 'evaporation rate 97 mm Hg vapor density (air = 1) ____ 1.11 @ 20°C complete solubility in water _ vapor pressure at 20°C ____ Stable ca 100 stability ____ % volatiles by volume ____ Not expected to occur. hazardous polymerization A clear, colorless liquid with a slight alcoholic odor. appearance and odor Heat, sparks, open flame, open containers, and poor ventilation. conditions to avoid _____ Strong oxidizing agents and reactive metals which will displace materials to avoid hydrogen. Incomplete combustion can generate carbon monoxide and other hazardous decomposition products toxic vapors such as formaldehyde. III. Fire and Explosion Hazard Data . 12°C (Tag closed cup) _____ auto ignition temperature _____ 385°C flash point, (test method) _____ 6.7 upper limit 36.5 May burn with an invisible flame. Mixtures with water as low as 21% 36.5 flammable limits in air % by volume: lower limit _ unusual fire and explosion hazards ____ by volume are still flammable (flash point below 37.8°C). Under some circumstances can corrode certain metals, including aluminum and zinc, and generate hydrogen gas. Carbon dioxide, dry chemical, alcohol foam, water mist or fog. extinguishing media Wear full protective clothing and self-contained breathing apparatus. special fire fighting procedures _____ Heat will build pressure and may rupture closed storage containers. Keep fire-exposed containers cool with water spray. IV. Hazardous Components TIV 200 ppm (skin) ca 100 Methanol 67-56-1 CAS no

Burdick & Jackson's Disclaimer: The information and recommendations presented in this Material Safety Data Sheet are based on sources believed to be reliable on the date hereof. Burdick & Jackson makes no representation on its completeness or accuracy. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties, either express or implied, of merchantability or fitness for a particular purpose or of any other nature are made with respect to the information provided in this Material Safety Data Sheet or to the product to which such information refers. Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or additional liability or responsibility resulting from the use of, or reliance upon, this information.

Attachment B

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Attachment B NORM Survey Report

Intera, Inc. Araho Facility Norm Survey

Section 1, Township 17 South, Range 36 East Lea County, New Mexico

November 4, 2003



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prepared for:

Intera, Inc. One Park Square 6501 Americas Parkway NE Suite 820 Albuquerque, New Mexico 87110

By:

Safety & Environmental Solutions, Inc. 703 E. Clinton Hobbs, New Mexico 88240 (505) 397-0510

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I. Background

Safety & Environmental Solutions, Inc. (SESI) was contracted by Intera, Inc. to perform a Naturally Occurring Radioactive Material (NORM) Survey on tanks and piping located at the Arahoe Facility. The facility is located in Section 1, Township 17 South, Range 36 East, Lea County, New Mexico. SESI is authorized by the New Mexico Environment Department (NMED) to decontaminate and survey pits, land and equipment under Radioactive Material License (RML) # NO333-02. (See Appendix A) This license requires that James R. Allen of SESI designate in writing the persons to perform decontamination and associated activities for each project. The authorized personnel for this project are as follows:

Radiation Safety Officer (RSO)James R. AllenRegistration # 398-6N(See Appendix B)

II. Radiation Protection

All personnel involved in radiation projects wear thermoluminescent dosimeter badges while conducting any procedures that may cause contact with NORM contaminated material. The badges are sent to the supplier each quarter and analyzed for levels of radiation exposure. Each participant in the project is protected with the appropriate respiratory and eye protection equipment. Protective boots or covers, gloves, and tyvek coveralls are worn at any time while moving, handling, or transporting any NORM contaminated equipment or material.

III. Work Performed

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On October 8, 2003, James R. Allen arrived on site at 8:00 A.M. and performed an external NORM survey of Tanks #1, #2, #3, #4, #5, #6, #7, and #8. The survey was conducted using a Ludium Measurements, Inc. Model 3 Survey Meter, serial # 135453, which was last calibrated on July 26, 2003. The probe used was Ludium Gamma Scintillation Probe Model 44-2, serial # RN 012537. The survey indicated Tank #1 to have a level of radiation of 58 uR/hr. The reading of Tank #2 indicated the level of radiation to be 24 uR/hr. The reading of Tank #3 indicated the level of radiation to be 52 uR/hr. The reading of Tank #4 indicated the level of radiation to be 18 uR/hr. The reading of Tank #5 indicated the level of radiation to be 28 uR/hr. The reading of Tank #6 indicated the level of radiation to be 46 uR/hr. The reading of Tank #7 indicated the level of radiation to be 30 uR/hr. (See Appendix C)

On October 22, 2003, James R. Allen arrived on site at 10:15 A.M. and performed an external NORM survey of miscellaneous metal piping, PVC piping, and scrap metal, Tank # 1, and Tank #6. The survey was conducted using a Ludium Measurements, Inc. Model 3 Survey Meter, serial # 155994, which was last calibrated on July 26, 2003. The probe used was Ludium Gamma Scintillation Probe Model 44-2, serial # RN 013125. The survey indicated the level of radiation of the pvc piping and scrap metal to be <20 uR/hr. The reading of Tank #6 indicated the level of radiation to be <20 uR/hr. Mr. Allen returned at the site at 5:00 P.M. and performed and external NORM survey of the disassembled Tank # 1 and Tank #3. The reading of the disassembled Tank #1 indicated the level of radiation to be <20 uR/hr. Mr. Allen returned at the site at 5:00 P.M. The reading of Tank #3 indicated the level of radiation to be <20 uR/hr. The reading of the disassembled Tank #1 indicated the level of radiation to be <20 uR/hr. The reading of Tank #6 indicated the level of Tank #3 indicated the level of radiation to be <20 uR/hr.

Arahoe Facility November 4, 2003

On October 23, 2003 James R. Allen arrived on site at 2:00 P.M. to perform an external NORM survey of 2 - 6" PVC pipes. The readings indicated the level of radiation to be <20 uR/hr. (See Appendix C)

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IV. Figures & Appendices

Figure 1 – Vicinity Map Appendix A – Radioactive Material License Appendix B – Personnel Registration Appendix C – Norm Survey Data Sheets ŕ

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Figure 1 Vicinity Map

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Appendix A Radioactive Material License

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GARY E. JOHNSON GOVERNOR State of New Mexico ENVIRONMENT DEPARTMENT Radiation Control Bureau 1190 St. Francis Drive P.O. Box 26110 Santa Fe, New Mexico 87502-6110 Telephone (505) 476-3236 Fax (505) 476-3232



PETER MAGGIORE SECRETARY

PAUL R. RITZMA DEPUTY SECRETARY

RADIOACTIVE MATERIAL LICENSE

Pursuant to Sections 74-3-1 through 74-3-16 NMSA 1978, and 20 NMAC 3.1, Subpart 3, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated in this license; and to use said radioactive material(s) for the purpose(s) and at the place(s) designated herein. This license is subject to all applicable rules, regulations, and orders now or hereafter in effect, of the New Mexico Environment Department and to any conditions specified herein.

 License Name	2. License Number
Safety & Environmental Solutions, Inc.	NO333-02
3a. Address 703 E. Clinton, Suite 103 Hobbs, NM 88240	3b. Actual Location of Operation 703 E. Clinton, Suite 103 Hobbs, New Mexico, 88240, and temporary job sites throughout NM not under exclusive Federal jurisdiction.
4. Telephone	5. Expiration Date
(505) 397-0510	January 30, 2007

Date: February 8, 2002

Attachments:

1) Radioactive Material Specifications

2) Authorized Use(s) and License Conditions

For the New Mexico Environment Department

Willianda

William M. Floyd, Program Manager Radiation Control Bureau

(mml)

ATTACHMENT 1 - RADIOACTIVE MATERIAL SPECIFICATIONS

LICENSE NUMBER NO333-02

6. RADIOACTIVE MATERIALS 7. FORM (element and mass number)

(chemical or physical)

8. MAXIMUM QUANTITY (Licensee may possess at any one time)

A. As needed for each job.

A. Any naturally occuring radioactive material as defined in the New Mexico Radiation Protection Regulations.

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END OF THIS SECTION



A. Any.

ATTACHMENT 2 - AUTHORIZED USE(S) AND LICENSE CONDITIONS



LICENSE NUMBER NO333-02

9. Authorized Use:

A. For decontamination of NORM contaminated pits, land and equipment and for its temporary handling and storage at temporary job sites in New Mexico under customer control.

For the purpose of this license, decontamination means the removal of media containing regulated NORM from equipment or facilities solely for the intended purpose of reducing levels of radiation to levels below regulated NORM levels in order to release equipment, materials or lands from restricted use in accordance with Subpart 14, 20 NMAC3.1.

10. The licensee shall comply with the provisions of Subparts 3, 4, and 10 of the New Mexico Radiation Protection Regulations.

11. Decontamination and associated activities shall be performed by persons designated in writing by Bob Allen, Radiation Safety Officer. Names and evidence of training of these individuals shall be kept on file for inspection by the Department.

12. Radiation workers must have successfully completed training specified in the license application. This training must be certified by the Department.

13. The Secretary of the Department or the Secretary's authorized representatives shall be allowed to enter the premises and inspect the radiation related activities at all reasonable times. Failure of the licensee to admit the Secretary or the Secretary's authorized representatives shall constitute grounds for issuance of an immediate cease and desist order.

14. Surveys:

14.A. Contamination surveys, appropriate to the job site, shall be performed at the temporary job site at the beginning and conclusion of every job, including the vicinity of waterways, if they exist.

14.B. The licensee shall assure by surveys that equipment and premises used in decontamination activities does not exceed 50 uR/hr. on contact at any accessible point prior to release from a customer NORM decontamination site. Soil surveys shall be conducted as outlined in Section 3.1.3 of API Bulletin E2, as outlined in the license application.

14.C. The licensee shall record survey results performed for compliance with this condition. The records shall identify the equipment items used in the decontamination process.

14.D. Survey equipment shall conform to Subpart 14, Section 1404, 20NMAC3.1.

15. A. The licensee shall provided written notification to the Department at least three (3) days prior to commencing NORM decontamination activities at customers sites. This notification shall specify the following:

ATTACHMENT 2 - AUTHORIZED USE(S) AND LICENSE CONDITIONS



LICENSE NUMBER NO333-02

- 15.(1). Type of operation;
- 15.(2). Mode of decontamination;
- 15.(3). Address and physical location of decontamination;
- 15.(4). Dates activities are conducted;
- 15.(5). Name of person in charge of the operation at the site.

15.B. If contaminated material is left in the possession of the customer, the licensee shall also submit the following information:

- 15.(1). Method of storage of contaminated material;
- 15.(2). Site of storage (map required if street address is not available);
- 15.(3). Location on site of material;

15.(4). Storage conditions (metal shed, pallets on open ground, etc.).

16. Each container holding NORM contaminated waste must be permanently marked with an identification number traceable to records documenting the original source of the contents.

17. Transfer of NORM, NORM waste and NORM contaminated equipment shall only be to persons specifically licensed to receive such materials, or to persons generally licensed under New Mexico Radiation Protection Regulations, 20NMAC3.1.

18. All incidents shall be reported to the Department in accordance with Subpart 4, paragraph 452, New Mexico Radiation Protection Regulations.

19. Whenever equipment has contained frac sand, or other materials that could have been contaminated with radioactive tracer materials, and the surface readings exceed 50 uR/hr, including background, an analysis must be done before decontamination procedures are initiated to determine that radioactive tracer materials are not present and that only NORM materials are being removed. Copies of these analyses should become a permanent part of the facility documentation files and should direct the decontamination activities carried out by the licensee.

20. The licensee may transport licensed material or deliver licensed material to a carrier for transport in accordance with the provisions of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transportation Under Certain Conditions". A properly marked shipping container of the type supplied with the device shall be used whenever the device is shipped by commercial carrier.

21. Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6., 7., and 8., of the license in accordance with statements, representations and procedures contained in, referenced in, or enclosed with the documents listed below. The most recent statements, representations, and procedures shall govern if they conflict with previously submitted documents:

* Application dated November 8, 1996, and addendum dated January 1, 1997;

ATTACHMENT 2 - AUTHORIZED USE(S) AND LICENSE CONDITIONS

LICENSE NUMBER NO333-02

* Administrative amendment dated August 27, 1998, signed by William M. Floyd, Program Manager;

* Telefax dated February 6, 2002, signed by James R. Allen.

END OF THIS SECTION

Arahoe Facility November 4, 2003

Appendix B Personnel Registration

 In accordance with Parl 2 of the New Mexico Radiation Projection Regulation Projection Regulation Projection Regulation Projection Regulation Projection Regulation Control Bureau as having the necessary training and knowledge to provide the both public and private concerns, and to licensees and registrants of the responsible for applying for limely renewal of registration(s) as they exponent information contained in this certificate to be inaccurate. New Mexico R POST OR FILE. POST OR FILE. This certificate and its provisions must be available for inspection. 	 An antigation of radiation and contaminants created by poll and gas NO The registrant is responsible for ensuring that all betrsonicel performing and mitigation of radiation and contaminants created by poll and gas NO The training shall follow a standardized formal which all a minimum and mitigation of radiation and contaminants created by poll and gas NO The training shall follow a standardized formal which all a minimum and mitigation of radiation and/or radioactive malefrial in the work place by health protection problems associated with exposure. And in the purpos of the applicable provisions of applicable regulations for the purpos of the appropriate response to warnings made in the even of the equivalent of any unit of the provisions of this registration do not relieve the registrant from the purpos of the provisions of this registration do not relieve the registrant from the provisions of the radiation do not relieve the registrant from the provisions of the radiation of not relieve the registrant from the purpos of the provisions of the radiation of not relieve the registrant from the purpos of the provisions of the radiation of not relieve the registrant from the purpos of the provisions of the radiation of the purpos of the purpos of the radiation of the purpos of the purpo	Registration Number(s) Radiological Service Specialty(s) For With a service of the service service service service services and consultation regarding nalufally occurring the registrant is responsible for ensuing that all personal beforming they possess adequate credentials to discharge their dules of the provisions of this registration do not relieve the registrant from the service service of the registration of the registrant of the registrant of the registrant of the provisions of this registration of the registrant of the registrant of the registrant of the provision of the registration of the registrant o	Certificate of Registration	
ations (20.8.2 NMAC), the above named person of lorganization is defradiological services in the speciality(s) indicated above. These New Mexico Radiation Control Bureau, The registrant shall not person able regulgements of the New Mexico Radiation Protection Regulat re individually, and shall notify this Bureau in writing before making adiation Control Bureau, PO Box 26110. Santa Ee, New Mexico-8; Stanley Fitch Radiation Control Bureau New Mexico Environment	spin (field framing registration realign, said how to perform N gservice punder his registration possing said the credentials to p gservice and control of the control of the credentials of the gresses the following for the control of the credentials of the doresses the following for the control of the credentials of the gresses the following for the control of the	Inch Certification is issued	James R. Allen Name sty & Environmental Solutions, Inc. Hobbs Organization City	
registered with the New Mexico Radiation e services will be provided in New Mexico to erform services which are not specifically tions (20.3 NMAC). The registant is g any changes which would render the 7502-6110, phone (505)476-3236. 10/9/2002 (Date) 7 7 7 7	ORM radialion surveys. provide proper instruction on the hazards al; lion and/or radioactive material; and clion Regulations. registrant (license #NO333-02).	Expiration Date(s) Oct 31, 2006 and oversight of the registrant, and that registrant (license #NO333-02). Oct 31, 2006	P.O. Box 1613 Street Address NM 88240 State/Province Zip/Postal Code	

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Appendix C Norm Survey Data Sheets

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Safety & Environmental Solutions, Inc.

NORM Survey Data Sheet

Facility/LocationAraboe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: <u>11</u> uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank #1 - 3,000 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum uR/hr: 58 uR/hr
Maximum Kcpm:
Comments:
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Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)



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Safety & Environmental Solutions, Inc.

NORM Survey Data Sheet

Facility/LocationArahoe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: 11 uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank # 2 - 210 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum <i>u</i> R/hr: 24 <i>u</i> R/hr
Maximum Kcpm:
Comments:
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Survey Conducted By- James R. Allen CHMM REM. CES

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Safety & Environmental Solutions, Inc.

NORM Survey Data Sheet

Facility/LocationArahoe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type: Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: <u>11</u> uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank # 3 - 750 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum uR/hr: 52 uR/hr
Maximum Kcpm:
Comments:
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Survey Conducted By: James R. Allen CHMM, REM, CES

(Signature)


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Safety & Environmental Solutions, Inc.

Facility/LocationArahoe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: <u>11</u> uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank # 4 - 500 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum uR/hr: 18 uR/hr
Maximum Kcpm:
Comments:
Survey Conducted By: James R. Allen CHMM, REM, CES
(Signature)



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Facility/LocationArahoe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: 11 uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank # 5 - 500 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum uR/hr: 28 uR/hr
Maximum Kcpm:
Comments:
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Survey Conducted By: James R. Allen CHMM, REM, CES
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Safety & Environmental Solutions, Inc.

NORM Survey Data Sheet

Facility/LocationArahoe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: <u>11</u> uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank # 6 - Fiberglass Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum uR/hr: 46 uR/hr
Maximum Kcpm:
Comments:
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Survey Conducted By- Lames R Allen CHMM REM CES

vey Conducted By: James R. Allen CHMM, REM, CES

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Safety & Environmental Solutions, Inc.

NORM Survey Data Sheet

Facility/LocationArahoe Disposal	Date	_10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc.	Serial N	umber: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 S	Serial Nu	nber: RN 012537
Battery Check: OK Source Check: OK		
Calibration Date: July 26, 2003	·	
Source Type: Cs 137 Date: 12/96 Serial Number: 4317		
Background Radiation Level: <u>11</u> uR/hr Location: 10' Inside	e South F	enceline
Description of Equipment/Material Surveyed: Tank # 7 - 200 Survey only, 18" from bottom of tank readings every 6' around	BBL Stee perimete	l Tank External r
Item/Material Surveyed:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Maximum <i>u</i> R/hr: 26 <i>u</i> R/hr		
Maximum Kcpm:		·
Comments:		
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Survey Conducted By: James R. Allen CHMM, REM, CES		

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Safety & Environmental Solutions, Inc.

Facility/LocationArahoe Disposal Date10-8-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 135453
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN 012537
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 12/96 Serial Number: 4317
Background Radiation Level: <u>11</u> uR/hr Location: 10' Inside South Fenceline
Description of Equipment/Material Surveyed: Tank # 8 - 500 BBL Steel Tank External Survey only, 18" from bottom of tank readings every 6' around perimeter
Item/Material Surveyed:
Maximum uR/hr: 30 uR/hr
Maximum Kcpm:
Comments:
Survey Conducted By: James R. Allen CHMM, REM, CES
(Signature)



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Safety & Environmental Solutions, Inc.

Facility/Location Arahoe Disposal Date10	-22-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Nur	nber: 155994
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Num	ber: RN013125
Battery Check: OK Source Check: OK	
Calibration Date: July 26, 2003	
Source Type: Cs 137 Date: 10/93 Serial Number: 2861	
Background Radiation Level: <u>11</u> <i>u</i> R/hr Location: <u>10'</u> Inside So	outh Fence line
Description of Equipment/Material Surveyed:Miscellaneous PVC Piping	and Scrap Metal
Item/Material Surveyed:	
Maximum <i>u</i> R/hr:	
Maximum Kcpm:	
Comments:	
Survey Conducted By: James R. Allen CHMM, REM, CES (Print Name)	
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Safety & Environmental Solutions, Inc.

Facility/Location Araboe Disposal Date 10-22-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 155994
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN013125
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 10/93 Serial Number: 2861
Background Radiation Level: <u>11</u> <i>u</i> R/hr Location: <u>10' Inside South Fence line</u>
Description of Equipment/Material Surveyed:# 6 Fiberglass Tank
Item/Material Surveyed:
Maximum <i>u</i> R/hr:
Maximum Kepm:
Comments:
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Survey Conducted By: James R. Allen CHMM, REM, CES
(Print Name) Annes R. aller
(Signature)



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Safety & Environmental Solutions, Inc.

Facility/Location Arahoe Disposal Date 10-22-03
Meter Model: Model 3 Survey Meter Ludlum Measurements, Inc. Serial Number: 155994
() Detector Type : Gamma Scintillation Probe Model: 44-2 Serial Number: RN013125
Battery Check: OK Source Check: OK
Calibration Date: July 26, 2003
Source Type: Cs 137 Date: 10/93 Serial Number: 2861
Background Radiation Level: <u>11</u> <i>u</i> R/hr Location: <u>10' Inside South Fence line</u>
Description of Equipment/Material Surveyed: #3-750 bbl. Steel Tank
Item/Material Surveyed:
Maximum <i>u</i> R/hr:46
Maximum Kepm:
Comments: 5:15 P.M.
Survey Conducted By: James R. Allen CHMM, REM, CES (Print Name) Amen Allow (Signature)

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Attachment C

Attachment C Photograph Log



No. 1 – Tanks #7 & #8.



No. 2 – Tanks on site prior to starting work.





No. 3 – Tanks 4, 5 & 6 with above ground piping still in place.



No. 4 – Looking north towards tanks 7 & 8 and the lined pit.





No. 5 – The 200 bbl fiberglass tank that has overflowed onto surrounding area.



No. 6 – Heavily stained soil at tank #6 and pvc piping.





No. 7 – Stained soil areas and above ground piping.



No. 8 – View of site looking north prior to starting work.





No. 9 - Areas of staining on site.



No. 10 – Ground staining with traffic and piping around the site.





No. 11 – Hot oil and water transport truck setting up.



No. 12 – Piping found that leads to Navajo Refinery.





No. 13 – Digging up lines by hand.



No. 14 – Using the hot oil truck to jet fluid in the fiberglass tank.





No. 15 – Removing trash including a bird from the valve of the 3000 bbl tank.



No. 16 - Crane set up to remove tank rings.





No. 17 – Buried piping between tanks 1 & 3 as it continues to be dug up.



No. 18 – The pit and plastic used for drained fluid from welded tanks.





No. 19 – Jetting and removal of fluid from 3000 bbl tank.



No. 20 – Approximately 500 bbls left in the 3000 bbl tank.





No. 21 – Ariel view of site and piping being removed.



No. 22 – Area of stockpiled piping that has been excavated.





No. 23 - Rings of the 3000 bbl tank being taken apart.



No. 24 – Mixing sand inside the 3000 bbl tank.





No. 25 – Mixing of the thick fluid with sand.



No. 26 – Using track hoe to remove walls of 3000 bbl tank.





No. 27 – The bigger chunks of concrete from the floor of the 3000 bbl tank.



No. 28 - Loading the smashed tank # 3 on flatbed trailer.





No. 29 - The site after work was completed.



No. 30 - The site after work was completed.



Attachment D

Attachment D Waste Disposal Manifests – Tank Contents - Liquid

	NON-HAZARDOUS	1. Generator's US EPA	ID No.	Manifest Doc. No.	2. Page 1						
3	Generator's Name and Mailing Address	New Mexico Oil C 1220 South St. Fra	onservation Dir	vision	WE/4,	Ara SE/4	nho Dir "Sec 1,	sposal Facilit T178,R31E	у		
4	Generator's Phone 505 476-3488	Santa Fe, New Me	US EPA ID I	Number	A. Transport	Lea er's Ph		nty, NM			
7	Chaparral Services, Inc Transporter 2 Company Name		US EPA ID I	N/A Number	B. Transport	er's Pl	ione	505-397-3044	+		
A Designated Eacility Name and Site Address											
	Sundance Services 2 miles East on Hwy 18 1 N/A 50								505-394-2511		
1	1. Waste Shipping Name and Description	<u> </u>	·····		12.	Contai	iners	13. Total Quantity	14. Unit		
a	Produced H20	TANK K	offom s	[1		me	130	BB<		
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D. Additional Descriptions for Materials Listed Above				E. Handling Codes for Wastes Listed Above							
1	5. Special Handling Instructions and Additional Info #5 Address: PO Drawe	rmation r 1769, Eunice, NM	88231		1						
			-								
	6. GENERATOR'S CERTIFICATION: 1 certify the n	naterials described above on	this manifest are not s	subject to federal regula	ations for reporti	ng prope	er disposa	Month Day	Aste. / Year 5 0.1		
	7. Transporter 1 Acknowledgement of Receipt of M Printed Typed Name	aterials	Signature	1 te	2			Month Day	Yea - O		
	8. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name	aterials	Signature		······································			Month Day	/ Yea		
	9. Discrepancy Indication Space	:									
	0. Facility Owner or Operator: Certification of recei	ot of waste materials cover	red by this manifest	except as noted in It	tern 19.						
	Printed/Typed Name		Signature	eller J	Loic	Ĺ		Month Da	y Yea		
		ORIGINAL – RE	ETURN TO GI	ENERATOR			192-F	ils æffer	A2/9		

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shipper. This will certify that no additional materials were added to this load, and that the material OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR VOLUME OF MATERIAL [] BBLS. White - Sundance Revised 12/27/95 FACILITY REPRESENTATIVE DRIVER: was delivered without incident. FACILITY FOR DISPOSAL. JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [] Tank Bottoms CHARGE TO: DATE: TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: Transporter Statement at the above described location, and that it was tendered by the above described [] Other Material: [] Production Water ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS Description: THIS WILL CERTIFY that the above Transporter loaded the material represented by this (SIGNATURE)-Canary - Sundance Acct #1 • VEHICLE NO .: 1.0 × Sundance Services, Inc. [] BS&W Content: [] Contaminated Soil (SIGNATURE) [] Drilling Fluids P. O. Box 1737 ★ Eunice, New Mexico 88231 TYPE OF MATERIAL Pink - Sundance Acct #2 . Ŷ, (505) 394-2511 Jacobian and a start of the second Ϋ., Second President Gold - Transporter Manual Contraction] YARD DRIVER NO .: [] Completion Fluids [] C-117 No.: TIME Superior Printing Service, Inc. 69923 6 AM/PM

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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID	No.	Manifest Doc. No.	2. Page 1 of			
		3. Generator's Name and Mailing Address	N/A						
	î l	0	New Merrico (bil Co	nservation Divis	sion		Araho D	isposal Facilit	tv ·
			1220 South St Fran	cie Drive	34741		SF/4 Sec	T178 R 31E	
		4. Generator's Phone 605 476 2499	Santa Eo Now Maxi	CIS DAVE		**5	Lea Cou	ntv NM	
		5. Transporter 1 Company Name	Ganta I C, New Mex	US EPA ID Nu	mber	A Transporte	r's Phone		
		Chanarral Services Inc.			N/A			505-397-3044	4
		7. Transporter 2 Company Name	8	US EPA ID Nu	mher	B Transporte	r's Phone		
			ĺ.,						
		9. Designated Facility Name and Site Address	<u></u>	US EPA ID Nu	mber	C. Facility's P	hone		
						· · · · · · · · · · · · · · · · · · ·			
		Sundance Services							
		2 miles East on Hwy 18			N/A			505-394-251	1
		11. Waste Shipping Name and Description		Lable "A		12. (Containers	13.	14.
			_			No	. Type	Totai Quantity	Unit Wt/Vol
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		D Additional Descriptions for Materials Listed Above	-				· · · · · · · · · · · · · · · · · · ·	· · · ·	
		D. Additional Descriptions for Materials Listed Abov	e	:		E. Handling C	odes for was	ites Listed Above	
				2					
		Non Hazardous						N/A	
		15. Oppoint Handling laste etimes and Additional lufe			<u> </u>				
÷.		13. Special Handling Instructions and Additional Info	mauon						هم
		Z							
		5							
		cr -							
		#5 Address: PO Drawer	1769, Eunice, NM 882	(31					· .
		16. GENERATOR'S CERTIFICATION: I certify the r	aterials described above on thi	s manifest are not subi	iect to federal regula	tions for reporting	proper dispos	al of Hazardous W	aste.
		Printed/Typed Name 77		Signature				Month Day	y Year
	¥١	Phite of	ζ. Ι	÷				1015	503
	Ţ	17. Transporter 1 Acknowledgement of Receipt of M	aterials			_			
	Ä	Printed/Typed Name	/	Signature	12	\angle		Month Day	/ Year
	S	here lennar	6		-12	<u> </u>		DB	503
	ទ្ឋ	18. Transporter 2 Acknowledgement of Receipt of M	aterials						
	Ë	Printed/Typed Name		Signature				Month Day	Year
	R								
		19. Discrepancy Indication Space							
									10
	F								
	FAC								
	FACIL	20. Facility Owner or Operator: Certification of receir	of waste materials covered	by this manifest ex	cept as noted in Ite	əm 19.			
	FACILIT	20. Facility Owner or Operator: Certification of receip	of waste materials covered	by this manifest ex	cept as noted in Ite	am 19.			
	FACILITY	20. Facility Owner or Operator: Certification of receip	ot of waste materials covered	by this manifest existing the second se	cept as noted in Ite	am 19.		Month Da	y Yəar
	FACILITY	20. Facility Owner or Operator: Certification of receip		by this manifest exponential states and the second states of the second	cept as noted in Ite	em 19.		Month Da	у _{Уеаг} 5-0-3
	FACILITY	20. Facility Owner or Operator: Certification of receip Sunstant Printed/Typed Name ME.II4	ot of waste materials covered	t by this manifest ex Signature		em 19. Proch		Month Da	у _{Уваг} 5 0.3
	FACILITY	20. Facility Owner or Operator: Certification of receip Sunstant Printed/Typed Name ME.I.G.	ACCORDICIDIAL	t by this manifest ex Signature		em 19. <u></u>		Month Da 1. ℃ 1. : 31254251267	y Year 5-0-3 22/98

White - Sundance Revised 12/27/95 FACILITY REPRESENTATIVE: was delivered without iperdent. shipper. This will certify that no additional materials were added to this load, and that the material Transporter Statement at the above described location, and that it was tendered by the above described FACILITY FOR DISPOSAL. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY **GEOTHERMAL ENERGY.** ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME VOLUME OF MATERIAL [] BBLS. [] Other Material: [] Tank Bottoms CHARGE DATE: **TRANSPORTER COMPANY:** LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: DRIVER: THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [] Production Water ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: Ч О (SIGNATURE) Canary - Sundance Acct #1 And a series 74 Shund Q. Box 1737 * Eunice, New Mexico 88231 VEHICLE NO .: A Sundance Services, Inc. (SIGNATURE [] Contaminated Soil [] Drilling Fluids] BS&W Content: TYPE OF MATERIAL Pink - Sundance Acct #2 1 × 50 (505) 394-2511 Gold - Transporter [] YARD DRIVER NO .: [] C-117 No.: [] Completion Fluids TIME Superior Printing Service, Inc. 63314 AM/PM

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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID	No.	Manifest Doc. No.	2. Page of	1					
	3	Generator's Name and Mailing Address	New Mexico Oil Cons 1220 South St. Francis	ervation Divis s Drive	sion	WE	Ara /4, SE/4,	ho Disp Sec 1,1	oosal Facility 17S,R31E			
	5	. Transporter 1 Company Name	6. US EPA ID Number A				A. Transporter's Phone					
	Chaparral Services, Inc. N/A 505											
	7. I ransporter 2 Company Name 8. US EPA ID Number B. Transporter's Phone											
	9	Designated Facility Name and Site Address	10.	US EPA ID N	Number	C. Facil	ity's Phone)	,			
		Sundance Services 2 miles East on Hwy 18	!		N/A		· .	- 50)5-394-2511			
	1	1. Waste Shipping Name and Description	<u></u>			•	12. Cont	ainers	13. Total	14. Unit		
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		D. Additional Descriptions for Materials Listed Abc	ove			E. Hand	lling Codes	for Wast	tes Listed Above			
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		Non Hazardous		:				N	//A			
	1	5. Special Handling Instructions and Additional Inf #5 Address: PO Drawer 1	formation	L								
		6. GENERATOR'S CERTIFICATION: I certify the	materials described above on this	s manifest are not si	ubject to federal regula	itions for re	porting prop	oer dispos	al of Hazardous Was	ste. Year		
ł		This AMI							10 15	-103		
T R A N		7. Transports 1 Acknowledgement of Receipt of Printed/Typed trans	Materials	Signature			2		Month Day	Year		
S P O		8. Transporter 2 Acknowledgement of Receipt of	Materials		<u> ~ ~</u>			·····				
RTER		Printed/Typed Name		Signature	· · · · · · · · · · · · · · · · · · ·				Month Day	Year		
FA	1	9. Discrepancy Indication Space			<u> </u>							
L L T	2	20. Facility Owner or Operator: Certification of rece	eipt of waste materials covered	by this manifest	except as noted in It	em 19.	1			1		
Y		Printed/Typed Name	~	Signature	illy 1	loa	ul		Month Day	Year TO: 3		
			ORIGINAL – RET	URN TO GE	ENERATOR			124 1	ଽ୲ୢଽଽୄ୶ଢ଼୕୳ଽଢ଼ୄ୲	52.33		

shipper. This will certify that no additional materials were added to this load, and that the material OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME VOLUME OF MATERIAL [] BBLS. [] Other Material: [] Tank Bottoms [] Production Water DATE: JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED CHARGÉ TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: Revised 12/27/95 DRIVER: was delivered without_incident FACILITY FOR DISPOSAL. GEOTHERMAL ENERGY. JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS White - Sundance FACILITY REPRESENTATIVE: Transporter Statement at the above described location, and that it was tendered by the above described ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: 5 (SIGNATURE) Canary - Sundance Acct #1 5 the Car VEHICLE NO .: 6.00 Sundance Services, Inc. [] Drilling Fluids (SIGNATURE) [] Contaminated Soil P. O. Box 1737 ★ Eunice, New Mexico 88231] BS&W Content: TYPE OF MATERIAL Pink - Sundance Acct #2 ju N (505) 394-2511 1 20224 Gold - Transporter [] YARD DRIVER NO .: [] C-117 No.: [] Completion Fluids TIME ÷, ту 14 ар 14 Э Superior Printing Service, Inc. £0669 AM/PM

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	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID N/A	No.	Manifest Doc. No.	2. Page of	1			
	 Generator's Name and Mailing Address Generator's Phone (505 476-3488 	New Mexico Oil Co 1220 South St. Fran Santa Fe. New Mex	nservation Divicis Drive	vision	v	A VE/4, SE I	Araho D /4,Sec I .ea Cou	isposal Fa 1,T17S,R3 ntv. NM	cility 1E
	5. Transporter 1 Company Name 6. US EPA ID Number A. Transporter's Phone Chaparral Services Inc I N/A 50							505-397-3	3044
	7. Transporter 2 Company Name	8. 	US EPA ID N	umber	B. Tran	sporter's f	hone		
	9. Designated Facility Name and Site Address	In Designated Facility Name and Site Address 10. US EPA ID Number C. Facility's Phone							
	Sundance Services 2 miles East on Hwy 18	1		N/A				505-394-2	2511
	Lea County 11. Waste Shipping Name and Description	L		<u> </u>	I	12. Cont	ainers	13. Total Quantity	14. Unit Wt0/ol
	* PROJUCES Hol	/ TANK .T.	Sottem	5		!	Mark	130	BB/
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	D. Additional Descriptions for Materials Listed Abov	e			E. Hand	lling Codes	for Wast	es Listed Abo	ove .
	Non Hazardous		:					N/A	
	15. Special Handling Instructions and Additional Info	rmation			I				
	#5 Address: PO Drawe	r 1769, Eunice, NM 88	231						
	16. GENERATOR'S CERTIFICATION: I certify the n	naterials described above on this	manifest are not su	oject to federal regula	itions for re	eporting pro	oer disposa	al of Hazardous	s Waste.
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ORTER	18. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name	laterials	Signature		. Are - **			Month	Day Year
F A C I	19. Discrepancy Indication Space				_				
	20. Facility Owner or Operator: Certification of recei	ot of waste materials covered	by this manifest e	xcept as noted in It	em 19.	/	1		
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÷., [] Other Material: White - Sundance Revised 12/27/95 FACILITY REPRESENTATIVE: DRIVER: shipper. This will certify that no additional materials were added to this load, and that the material FACILITY FOR DISPOSAL. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME **VOLUME OF MATERIAL** [] BBLS. [] Tank Bottoms [] Production Water CHARGE TO: DATE: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: was delivered without incident. Transporter Statement at the above described location, and that it was tendered by the above described TRANSPORTER COMPANY: JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: (SIGNATURE) Canary - Sundance Acct #1 **VEHICLE NO.:** نم لا 12372 MM Sundance Services, Inc. (SIGNATURE) [] Drilling Fluids] Contaminated Soil P. O. Box 1737 ★ Eunice, New Mexico 88231] BS&W Content: لمراجع ومراجع TYPE OF MATERIAL Pink - Sundance Acct #2 のシャロな (505) 394-2511 -12 12 Gold - Transporter] YARD The wine capping the property **DRIVER NO.:** [] C-117 No.: [] Completion Fluids TIME *** 1:3 Superior Printing Service, Inc. 69905 AM/PM

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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US I	EPA ID No.	Manifest Doc. No.	2. Page 1 of						
	3.	Generator's Name and Mailing Address	<u>N/A</u>	<u> </u>		<u> </u>						
New Mexico Oil Conservation Division Arabo Dia							nosal Facility					
	1220 South St Econois Drive WEAK SEA Sea 1 T175							PUSAL PACILITY				
	4.	4. Generator's Phone (5 476) 3488 Santa Eo Now Maxico 97505						VVC/4, SE/4, Sec 1, 11/5, K51E				
	5	5. Transporter 1 Company Name 6. US FPA ID Number						A Transporter's Phone				
	0.	Chanarral Services Inc. N/Δ					505-397-3044					
7. Transporter 2 Company Name 8. US EPA ID Number 8. Transporter's Phone						0,-377-3044						
	Contrainsporter 2 company name o. US EFAID Number B. Transporter's Phone											
		9. Designated Facility Name and Site Address 10 LIS FPA ID Number						C Equilibria Phage				
	3. Designated Facility name and site Address 10. US EPA ID Number C. Facility's Phone											
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	11	. Waste Shipping Name and Description					12. Com	amers	Total	Unit		
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▼ TRANSPORTER FAC-L-TY	15 16 17 18 19 20	Non Hazardous Non Hazardous Special Handling Instructions and Additional In #5 Address: PO Drawer GENERATOR'S CERTIFICATION: I certify the Printed/Typed Name Discrepancy Indication Space Facility Owner or Operator: Certification of rece Printed/Typed Name KEMM	formation	882.31 re on this manifest are not Signature Signature Signature Signature Signature Signature	subject to federal regula To federal regula at except as noted in It	ations for rep	orting prop	2 per dispos	V/A sai of Hazardous War Month Day / O / S Month Day / O / S Month Day / O / S	ste. Year Year Year Year Year Year Year Year		
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Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident. DRIVER: (SIGNATURE) FACILITY REPRESENTATIVE: (SIGNATURE) White - Sundance Canary - Sundance Acct #1 Pink - Sundance Canary - Sundance Acct #2 Gold - Transporter Superior Printing Service, Inc. Superior Printing Service, Inc.	ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL. THIS WILL CERTIFY that the above Transporter loaded the material represented by this	AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.	VOLUME OF MATERIAL [] BBLS.	[] Production Water [] Drilling Fluids [] Completion Fluids [] Tank Bottoms [] Contaminated Soil [] C-117 No.: [] Other Material: [] BS&W Content: [] Description: [] Description:	CHARGE TO: 1/1/2014 AC	TRANSPORTER COMPANY: AM/PM DATE: ////////////////////////////////////	LEASE OPERATOR/SHIPPER/COMPANY:	Sundance Services, Inc. M. 69917 P. O. Box 1737 * Eunice, New Mexico 88231 (505) 394-2511

	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No	р. Л	Manifest Doc. No.	2. Page 1 of			
¥	3. Generator's Name and Mailing Address			~		Amho	Disposal Facil	itsr
		1220 South St. Francis	Drive	on	WE/4,	SE/4,Sec	: 1,T17S,R31E	
	4. Generator's Phone505 478-3488	Santa Fe, New Mexico	87505		A	Lea Co	unty, NM	
	Chaparral Services, Inc.	ь. [N/A	A. Transpon	ers Phone	505-397-304	4
	7. Transporter 2 Company Name	8.	US EPA ID Nur	nber	B. Transport	er's Phone) _	
	9. Designated Facility Name and Site Address	10.	US EPA ID Nur	nber	C. Facility's	Phone		
	Sundance Services 2 miles East on Hwy 18		1	N/A			505-394-251	1
	1. Waste Shipping Name and Description		<u> </u>	<u> </u>	1 12.	Container	s 13. Total	14. Unit
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	D. Additional Descriptions for Materials Listed Abov	e	÷1		E. Handling	Codes for V	Vastes Listed Abov	ve :
					1	· · · ·		
	Non Hazardous						N/A	
	Non Hazardous 15. Special Handling Instructions and Additional Info	rmation				·.	N/A	
	Non Hazardous 15. Special Handling Instructions and Additional Info	rmation				 	N/A	
	Non Hazardous 15. Special Handling Instructions and Additional Info	rmation					N/A	
	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer 1	rmation 1769, Eunice, NM 88231					N/A	
	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer 1	rmation 1769, Eunice, NM 88231					N/A	
	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer 1 16. GENERATOR'S CERTIFICATION: 1 certify the n PgingerTyped Name	rmation 1769, Eunice, NM 88231 naterials described above on this m	nanifest are not subj gnature	ect to federal regula	tions for reportin	ng proper dis	N/A posal of Hazardous Month (2	Waste. Day Year
V	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer 1 16. GENERATOR'S CERTIFICATION: 1 certify the n Prime Typed Name Mutagement	rmation 1769, Eunice, NM 88231 naterials described above on this m Si	aanifest are not subj gnature	ect to federal regula	tions for reportin	ng proper dis	N/A	Waste. Day Year
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	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer I 16. GENERATOR'S CERTIFICATION: I certify the n Printed Typed Name 17. Transport 1 Acknowledgement of Receipt of M Printed Typed Name 0.5510 18. Transport 2 Admonded areas of Passion of M	rmation 1769, Eunice, NM 88231 naterials described above on this m Si laterials Si laterials	ignature		ntions for reportin	ng proper dis	N/A posal of Hazardous Month	Waste. Day Year SO3 Day Year ISO
	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer I 16. GENERATOR'S CERTIFICATION: I certify the n Prime Typed Name 17. Transporter 1 Acknowledgement of Receipt of M Printed/Typed Name 18. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name	rmation 1769, Eunice, NM 88231 naterials described above on this m laterials laterials	ignature	ect to federal regula	tions for reportin	ng proper dis	N/A posal of Hazardous Month ()) () (Month () () () Month () (Waste. Day Year SQ3 Day Year AS O3 Day Year
	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer 1 16. GENERATOR'S CERTIFICATION: 1 certify the n Prime Typed Name 17. Transporter 1 Acknowledgement of Receipt of M Printed Typed Name Stin 18. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name 19. Discrepancy Indication Space	rmation 1769, Eunice, NM 88231 naterials described above on this m si laterials laterials Si laterials Si Si	ignature	ect to federal regula	tions for reportin	ng proper dis	N/A sposal of Hazardous Month L Month L Month L Month L	Waste. Day Year 25 03 Day Year 25 0 Day Year
► FRAZSPORTER FAC	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer I 16. GENERATOR'S CERTIFICATION: I certify the n Printed Typed Name 17. Transport 1 Acknowledgement of Receipt of M Printed Typed Name 18. Transport 2 Acknowledgement of Receipt of M Printed/Typed Name 19. Discrepancy Indication Space	rmation 1769, Eunice, NM 88231 naterials described above on this m laterials	ignature	ect to federal regula	tions for reportin	ng proper dis	N/A posal of Hazardous Month ()) () (Month () () () Month () (Waste Day Year SOJ Day Year Sology Year
► TRAZSPORTER FAU-L-	Non Hazardous 15. Special Handling Instructions and Additional Info #5 Address: PO Drawer I 16. GENERATOR'S CERTIFICATION: I certify the n Printed Typed Name 17. Transporter 1 Acknowledgement of Receipt of M Printed Typed Name 18. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name 19. Discrepancy Indication Space 20. Facility Owner or Operator: Certification of receipt	rmation 1769, Eunice, NM 88231 naterials described above on this m laterials	ignature	ect to federal regula	ntions for reportin	ng proper dis	N/A sposal of Hazardous Month []]]] Month [Month []	Waste. Day Year 25 03 Day Year Day Year
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shipper. This will certify that no additional materials were added to this load, and that the material VOLUME OF MATERIAL [] BBLS. White - Sundance Revised 12/27/95 OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME [] Other Material: DRIVER: Transporter Statement at the above described location, and that it was tendered by the above described FACILITY FOR DISPOSAL JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [] Tank Bottoms DATE FACILITY REPRESENTATIVE: was delivered without incident. GEOTHERMAL ENERGY. THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE [] Production Water CHARGE TO: TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS Description: THIS WILL CERTIFY that the above Transporter loaded the material represented by this (SIGNATURE) Canary - Sundance Acct #1 N. S. S. VEHICLE NO. Sundance Services, Inc. (SIGNATURE) [] BS&W Content: [] Drilling Fluids [] Contaminated Soil P. O. Box 1737 ★ Eunice, New Mexico 88231 **`**?_ Ĭ, TYPE OF MATERIAL Pink - Sundance Acct #2 • • • • • • • • • منعموس يترويزم (505) 394-2511 111 È. 1 1 P. Gold - Transporter [] YARD DRIVER NO .: [] C-117 No.: [] Completion Fluids TIME ноун Колар 1-00 Superior Printing Service, Inc. 93669 AM/PM

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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's U	IS EPA ID N N/ A	ło.	Manifest Doc.	No. 2. F . 0	age 1 f						
	3.	Generator's Name and Mailing Address	New Mexico 1220 South S	Oil Cons St. Franci	servation D	ivision		Araho Disposal Facility WE/4, SE/4,Sec 1,T17S,R31E						
	5.	Transporter 1 Company Name			US EPA IC	Number	Δ 7	ransporter	Phone	nty, NM				
	••	Chaparral Services, Inc.		j		. N/A		ranoporter	i none	505-397-304	4			
	7.	Transporter 2 Company Name												
	9.	Designated Facility Name and Site Address		10.	US EPA IC	Number	C. F	acility's Pho	ne					
		Sundance Services 2 miles East on Hwy 18		1		N/A				505-394-251	1			
	11	. Waste Shipping Name and Description	· · · · · · · · · · · · · · · · · · ·					12. Co	ontainers	13. Total Quantity	14. Unit Wt0(c)			
	a.	PROduced H20/-	TANK &	eHon	n S			/ .	TAnk	/30	811			
GENE	b.		/ · · · · ·				·.							
RATOR	c.				,				<u>.</u>					
	d.								,					
	D.	Additional Descriptions for Materials Listed Abov	/e		<u>-</u>	, <u></u> ,	E. +	landling Cod	les for Wa	stes Listed Abov	/e			
		Non Hazardous								N/A				
	15	: Special Handling Instructions and Additional Info #5 Address: PO Drawer 1	769, Eunice, N	IM 88231										
	16	. GENERATOR'S CERTIFICATION: 1 certify the m	naterials described a	bove on this	manifest are not	subject to federal re	gulations	or reporting p	roper dispo	sal of Hazardous	Waste.			
↓		Strived Typed Narger		5	Signature					Month D	lay Year			
Ţ	17	'. Transporter / Acknowledgement of Receipt of M	laterials		-	XA-								
A N S	5	SFRIM (SNI) i bo				HAN XI		7			5 27			
P	18	3. Transporter 2 Acknowledgement of Receipt of N	laterials) un								
HT ER		Printed/Typed Name		5	Signature					Month D	Day Year · ·			
F A C -	19). Discrepancy Indication Space												
	20	. Facility Owner or Operator: Certification of receip	pt of waste materie	uls covered i male	by this manifes	t except as noted	in Item 19 2	ə. A						
Ľ		Printed/Typed Name	Conch		Signature	Vy Ko	ach		g and g all the state	Month L	Day Year 503			
			ORIGINAL	. – RETI	JRN TO G									

was delivered without incident. shipper. This will certify that no additional materials were added to this load, and that the material MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS VOLUME OF MATERIAL [] BBLS. [] Other Material: [] Tank Bottoms CHARGE TO: DATE: TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: FACILITY REPRESENTATIVE: DRIVER: GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR [] Production Water Revised 12/27/95 FACILITY FOR DISPOSAL. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED White - Sundance Transporter Statement at the above described location, and that it was tendered by the above described ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: (SIGNATURE) Canary - Sundance Acct #1 VEHICLE NO .: 1 march 100-S. marting Sundance Services, Inc. [] Contaminated Soil [] Drilling Fluids P. O. Box 1737 ★ Eunice, New Mexico 88231 (SIGNATURE)] BS&W Content: Lard water TYPE OF MATERIAL Pink - Sundance Acct #2 and a sea (505) 394-2511 10 × 10 Gold - Transporter [] YARD **DRIVER NO.:** and the factor of [] C-117 No.:] Completion Fluids TIME 10 Superior Printing Service, Inc. £, 90669 AM/PM

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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US	EPA ID No.	Manifest Doc. No.	2. Page	1			
	3.	Generator's Name and Mailing Address	New Mexico O 1220 South St. Santa Fe. New	fil Conservation D Francis Drive Mevico 87505	ivision	WE/	A1 4, SE/-	raho Dis 4,Sec 1,7	posal Facility F17S,R31E	
	4. 5.	Transporter 1 Company Name Chanarral Services Inc		6. US EPA I	D Number	A. Trans	porter's	Phone		
	7.	Transporter 2 Company Name		8. US EPA I	D Number	B. Trans	porter's	Phone		
	9.	Designated Facility Name and Site Address	D Number	C. Facilit	y's Phor	10				
Sundance Services 2 miles East on Hwy 18 N/A 505-394-2511										
	11	. Waste Shipping Name and Description				•	12. Cor No.	ntainers Type	13. Total Quantity	14. Unit Wt/Vol
	a.	PRODUCEZ . H20 /	PANK	Bottom (ţ.	TANK	130	3 4
GENE	b.	· · · · · · · · · · · · · · · · · · ·								
RATO	c.									+
	d.						· ·	,	••••••	
	D	Additional Descriptions for Materials Listed Abov	/8	ż		E. Handli	ing Code	es for Was	tes Listed Above	<u> </u>
		Non Hazardous						N	I/A	
	1!	5. Special Handling Instructions and Additional Info	ormation							
		#5 Address: PO Drawer 1	769, Eunice, NM	f 88231						
	1	6. GENERATOR'S CERTIFICATION: (certify the r	materials described abo	ove on this manifest are n	ot subject to federal regula	ations for rep	orting pr	oper dispos	al of Hazardous Wa Month Day	ste. Year
ľ		The Ath,				<i>c</i>			17,01-15	-103
-cezino		7. Transporter 1 Acknowledgement of Receipt of M Printed/Typed Manne DERGLD ARCI Do	Materials	Signature		Ŵ	>		Month Day	rear b.5
		 Transporter 2 Acknowledgement of Receipt of N Printed/Typed Name 	Aaterials	Signature					Month Day	Year
	1!	9. Discrepancy Indication Space								<u></u>
	20	D. Facility Owner or Operator: Certification of recei	pt of waste materials	covered by this manife	est except as noted in It	tem 19.	,			
			teh	Signature	Dy Roo	cl	2		Month Day	year 793
							A della si m	and the second second		

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VOLUME OF MATERIAL [] BBLS. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME White - Sundance Revised 12/27/95 shipper. This will certify that no additional materials were added to this load, and that the material TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED [] Other Material: CHARGE DATE DRIVER: FACILITY FOR DISPOSAL. JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [] Tank Bottoms LEASE NAME: FACILITY REPRESENTATIVE: was delivered without incident. Transporter Statement at the above described location, and that it was tendered by the above described [] Production Water TRANSPORTER COMPANY: LEASE OPERATOR/SHIPPER/COMPANY: ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: Ч О (SIGNATURE) Canary - Sundance Acct #1 Ĉ VEHICLE NO .: Sundance Services, Inc. والمريحة والمعلمة والمسلمة وال (SIGNATURE) [] Drilling Fluids [] BS&W Content: [] Contaminated Soil P. O. Box 1737 ★ Eunice, New Mexico 88231 . **х** TYPE OF MATERIAL Pink - Sundance Acct #2 (505) 394-2511 1. 1. 1. N. N. N. 7 Gold - Transporter 3 DRIVER NO .: [] C-117 No.: [] Completion Fluids TIME Superior Printing Service, Inc. 69916 AM/PM

	-	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US	EPA ID No.	Manifest Doc. No.	2. Page 1 of			
		3. Generator's Name and Mailing Address	<u> </u>	<u> </u>			L		
	[N	lew Mexico Oil C	Conservation D	ivision	A A	raho Disp	osal Facility	
		4. Generator's Phones (175 2)498	220 South St. Fra	ancis Drive		WE/4, SE/	4,Sec 1,T	17S,R31E	÷1
		5. Transporter 1 Company Name		S. US EP	A ID Number	A. Transporte	r's Phone	(<u>)</u> [N][N]	;
		Chaparral Services, Inc.			• N/A•••••	D T	50	5-397-3044	
2+ -		7. Transporter 2 Company Name				B. Transporte	rs Phone		
		9. Designated Facility Name and Site Address	h	PA ID Number	C. Facility's P	hone			
•		Sundance Services							
н., ,	H	2 miles East on Hwy 18	1		. N/A		50	5-394-2511	*.
	lŀ	11. Waste Shipping Name and Description	A			12.	Containers	13. Total	14.
4	ļļ		<u></u>			N	o. Type	Quantity	Wt/Vol
		P_{a} P_{a} $+ 1$	T. L R.	Hand			Tank	130	5.51
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	E				·	· .		<u> </u>	
	A	c.							
	O R	<u>.</u>							
		d.		<u> </u>					
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		D. Additional Descriptions for Materials Listed Abor	ve		<u></u>	E. Handling C	odes for Wa	I Listed Above	e
				3			•		
		Non Hazardous					N	/A	
		15. Special Handling Instructions and Additional Infe	ormation	·					
				~~~					:
		#5 Address: PO Drawer 176	99, Eunice, NM &	8231					
-			·····						
		16. GENERATOR'S CERTIFICATION: 1 certify the I	materials described abov	ve on this manifest ar	e not subject to federal regula	tions for reporting	g proper disp	Month D	Vaste.
	¥	The gar		Signature	$\Delta$			1.6 1.	503
	T R	17. Transcotter 1 Acknowledgement of Receipt of N	Materials						
	ANS	Filted Typed Name		Signature	Kurrel) Ma	N		Month Di	s br
	P	18. Transporter 2 Acknowledgement of Receipt of N	Materials		guine and	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
		Printed/Typed Name		Signature				Month D.	ay Year
ľ	-	19. Discrepancy Indication Space	· · · · · · · · · · · · · · · · · · ·	1					
	F								
	ĉ		÷						
	Ļ	20. Facility Owner or Operator: Certification of rece	ipt of waste materials	covered by this ma	nifest except as noted in It	em 19.			
	Ý	Printed/Typed Name / // /	1	Signature	1711 1	#		Month D	ay Year
, ,		Helly 12	open		<u>Cellegke</u>	all	AND AND AND A	VOV	507
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	n re		ORIGINAL -	- RETURN TO	O GENERATOR	a star ha ha		1. J. A. B. B. M. 188	

White - Sundance Revised 12/27/95 shipper. This will certify that no additional materials were added to this load, and that the material **Hank Bottoms** FACILITY REPRESENTATIVE: DRIVER: was delivered without inciden FACILITY FOR DISPOSAL. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME VOLUME OF MATERIAL [ ] BBLS. CHARGE TO: DATE: TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: Transporter Statement at the above described location, and that it was tendered by the above described TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [ ] Production Water ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: (SIGNATURE) Canary - Sundance Acct #1 v VEHICLE NO .: 1 arx 21. 21 Sundance Services, Inc. [ ] Contaminated Soil (SIGNAĻORE) [ ] Drilling Fluids P. O. Box 1737 ★ Eunice, New Mexico 88231 ] BS&W Content: TYPE OF MATERIAL Pink - Sundance Acct #2 (505) 394-2511 3 J, 1267:00 Gold - Transporter 8 CC1 ] YARD **DRIVER NO.:** Y [ ] C-117 No.: [ ] Completion Fluids TIME 12 2031.60 Superior Printing Service, Inc. 69927 AM/PM

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	NON-HAZARDOU WASTE MANIFES	S 1. Generator's	s US EPA ID No.	Manifest Doc. No.	2. Page 1 of			
	<ol> <li>Generator's Name and Mailing Add</li> <li>Generator's Phone ( 505 476-3488</li> </ol>	ress New Mexico ( 1220 South St Santa Fe, New	/A Dil Conservation L Francis Drive V Mexico 87505	Division	WE/4, SE	Araho Dispo 74,Sec 1,T1 .ea County	osal Facility 7S,R31E NM	
	5. Transporter 1 Company Name Chaparral Service	es Inc	6. US	EPA ID Number	A. Transpor	ter's Phone	5-397-3044	
	7. Transporter 2 Company Name	,	8. US	EPA ID Number	B. Transpor	ter's Phone		
	9. Designated Facility Name and Site	Address	10. US	EPA ID Number	C. Facility's	Phone	·	
	2 miles East on Hy	s wy 18		N/A		50:	5-394-2511	
2	11. Waste Shipping Namiaty Descrip	tion			12	. Containers	13. Total Quantity	14. Unit Wt/Vol
	a. Produced H	20/ TANK	Bettoms			TANK	130	RB/
- GENE	b.	·		·····				
RATOR	c. /							
	d.					.,		
	D. Additional Descriptions for Material	s Listed Above	۔ د		E. Handling	Codes for Wa	Lstes Listed Abov	e
	Non Hazardous					N/	A	
	15. Special Handling Instructions and A	Additional Information						
	#5 Address: PO I	Drawer 1769, Eunice, N	<b>M</b> 88231					
	16. GENERATOR'S CERTIFICATION Printed Typed Name	: I certify the materials describe	d above on this manifest Signatur	are not subject to federal regulate	ations for report	ing proper dispo	sal of Hazardous \ Month D	Naste. ay Year
Į↓ Ţ	17 Transporter Machanulariament	1 Beceint of Materials			17		101.	2103
RANS	Printed Uped Name 1 A 2012 (2012)	45	Signatur	e La C			Month D	ay Year 5 Q3
POR	18. Transporter 2 Acknowledgement of	f Receipt of Materials	Ginnet		•		Mooth D	av Vaar
ÊR			Signatur	·····				
F A C	19. Discrepancy Indication Space	4						
	20. Facility Owner or Operator: Certific	ation of receipt of waste mate	erials covered by this r $(3)$	nanifest except as noted in I	tem 19. 2			
	Printed/Typed Name	NOS	Signatur				Month [	lay Year SQ7
		OPICIN					1109105430	201

THIS WILL CERTIFY that the above Transporter loaded the material represented by this         Transporter Statement at the above described location, and that it was tendered by the above described         shipper. This will certify that no additional materials were added to this load, and that the material         was delivered without incident.         DRIVER:       (SIGNATURE)         (SIGNATURE)         FACILITY REPRESENTATIVE:         (SIGNATURE)         White - Sundance         Canary - Sundance Acct #1         Pink - Sundance Acct #2         Gold - Transporter         Superior Printing Service, Inc.	ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY. ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.	VOLUME OF MATERIAL E-I BBLS.       I PARD       I YARD       I I         AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS       JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS       MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME         TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED       TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED	[] Production Water       [] Drilling Fluids       [] Completion Fluids         [] Tank Bottoms       [] Contaminated Soil       [] C-117 No.:         [] Other Material:       [] BS&W Content:       [] C-117 No.:         Description:       Image: Content	TRANSPORTER COMPANY:     Image:	LEASE OPERATOR/SHIPPER/COMPANY:	Sundance Services, Inc. N. 69936 P. O. Box 1737 * Eunice, New Mexico 88231 (505) 394-2511 /C

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	NON-HAZARDOUS	1. Generator's US EPA ID	No. Ma	inifest Doc. No.	2. Page 1			
	3. Generator's Name and Mailing Address	N/A						
Î		New Mexico Oil Conser	vation Division		Ara	ho Dispos	al Facility	
	4. Generator's Phone ( )	1220 South St. Francis I			WE/4, SE/4,	Sec 1,T17	S,R31E	
	5. Transporter 1 Company Name	6.	US EPA ID Numb	)er	A. Transporte	's Phone	****	
	7. Transporter 2 Company Name	8.	US EPA ID Numb	 Der	B. Transporte	<u>505-</u> rs Phone	397-3044	
	9 Designated Facility Name and Site Address			<u>.</u>	C Eacility's Pl			
	5. Designated radinty Marie and Site Address	10.	US EFA ID NUME		C. Facility S FI	ione		
	Sundance Services	1	bt/A			505	201.2511	
	11. Waste Shipptag Qana by d Description		<u>· · · i\/A</u>	· · · · ·	12. (	Containers	13. Total	14.
					No	. Type	Quantity	WtVol
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	d.							
	D. Additional Descriptions for Materials Listed	Above	÷.		E. Handling C	odes for Was	tes Listed Above	
						÷.		
Ç.	Non Hazardous					N/A	·	
	15. Special Handling Instructions and Additiona	I Information						
•								
	#5 Address: PO Drawer 1	769, Eunice, NM 88231						
	16. GENERATOR'S CERTIFICATION: 1 certify	the materials described above on th	is manifest are not subjec	t to federal regula	itions for reporting	proper dispos	al of Hazardous Was	ste.
	Printed/Typed Name		Signature				Month Day	
Ţ	17. Transporte Acknowledgement of Receipt	of Materials			1		1.013	
	Printed/Typed Name		Signature	0 / L			Month Day	Year
7P OB	18. Transporter 2 Acknowledgement of Receipt	of Materials	Just -					
T E A	Printed/Typed Name		Signature				Month Day	Year ·
	19. Discrepancy Indication Space		· · · · · · · · · · · · · · · · · · ·					
F A C	live 13: correct	quantify						
	20. Facility Owner or Operator: Certification of r	receipt of waste materials covere	d by this manifest exce	pt as noted in It	em 19.			
Ý	Printed/Typed Name		Signatures /	$\neg \neg$			Month Day	Year
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		ORIGINAL – RE	() TURN TO GENE	RATOR				

shipper. This will certify that no additional materials were added to this load, and that the material White - Sundance Revised 12/27/95 FACILITY REPRESENTATIVE: DRIVER: FACILITY FOR DISPOSAL. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS VOLUME OF MATERIAL [~] BBLS. [ ] Other Material: [ ] Production Water CHARGE TO: DATE: LEASE NAME: was delivered without incident. Transporter Statement at the above described location, and that it was tendered by the above described THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE [ ] Tank Bottoms TRANSPORTER COMPANY: LEASE OPERATOR/SHIPPER/COMPANY: ſ ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: (SIGNATURE) ζ Canary - Sundance Acct #1 **e**., . VEHICLE NO .: " Sundance Services, Inc. (SIGNATURE) P. O. Box 1737 ★ Eunice, New Mexico 88231 ] Drilling Fluids ] BS&W Content: ] Contaminated Soil TYPE OF MATERIAL Pink - Sundance Acct #2 1 (505) 394-2511 -Gold - Transporter [ ] YARD DRIVER NO .: [ ] C-117 No.: [ ] Completion Fluids TIME Superior Printing Service, Inc. **59**940 AM/PM

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		NON-HAZARDOUS	1. Generator's US	SEPA ID No.	Manifest Doc. No	. 2. Page 1	<u> </u>		a da ang sanah ang	
		WASTE MANIFEST	New Mexico	Oil Conservation	Division	of		traho Di	i <del>snosal Facili</del>	<del>tv</del>
	3	. Generator's Name and Mailing Address	1220 South S	St. Francis Drive	201100401	WE	/4, SE	/4,Sec 1	,T17S,R31E	
		505 476-3488	Santa Fe, Ne	ew Mexico 87505			I.	ea Com	nty, NM	2
	4	. Generator's Phone ( ) ————————————————————————————————————			<u>N/A</u>				505-397-304	4
	5	. Transporter 1 Company Name		6. US EPA	ID Number	A. Transpo	orter's F	Phone		
	7	'. Transporter 2 Company Name	······	8. US EPA	ID Number	B. Transpo	orter's	Phone	······	
	L		· · · · · · · · · · · · · · · · · · ·	<u> </u>	<u></u>					
	18	). Designated Facility Name and Site Address		10. US EPA	ID Number	C. Facility	s Phon	e	505 204 051	1
		Lea County			N/A				000- <u>39</u> 4-201	1 .'
	L			<u> </u>	<u></u>	1				
	1	1. Waste Shipping Name and Description				1	2. Con	Type	13. Total Quantity	Unit
	4		········	· · · · · · · · · · · · · · · · · · ·					Quantity	110 101
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ľ	ī	<ol> <li>Additional Descriptions for Materials Listed Above</li> </ol>	e	2 :	······	E. Handlin	g Code	s for Wast	es Listed Above	-
		Non Hazardous						· .	N/A	!
	-	15. Special Handling Instructions and Additional Info	rmation	·····		1				
		#5 Address: PO Drawer	1769 Ennice N	NM 88231						
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	$\left  \right $	16. GENERATOR'S CERTIFICATION: 1 certify the m Printed/Typed Name (	naterials described ab	ove on this manifest are i Signature	not subject to federal regul	lations for repo	rting pro	per disposi	al of Hazardous W	aste. v Year
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Ā	F	17. Transporter Acknowledgement of Receipt of M	laterials		A A					
A N S	-	Finted Typed Manye		Signatore	WILL AND	110			Month Day	y Year
ğ	Ē	18. Transporter 2 Acknowledgement of Receipt of M	aterials		all gall					
Î		Printed/Typed Name		Signature					Month Day	y Year
R	+	19. Discrepancy Indication Space	<u></u>		·					
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Ĩ L		20. Facility Owner or Operator: Certification of receip	ot of waste material	s covered by this mani	est except as noted in I	Item 19.				
T T	Ľ			· · · · · · · · · · · · · · · · · · ·						
		Printed/Typed Name KILMINS		Signature					Month Da	y Year S CS
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VOLUME OF MATERIAL [ ] BBLS. OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME White - Sundance Revised 12/27/95 was delivered without incident. shipper. This will certify that no additional materials were added to this load, and that the material CHARGE TO: DATE DRIVER: FACILITY FOR DISPOSAL. JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED FACILITY REPRESENTATIVE: Transporter Statement at the above described location, and that it was tendered by the above described JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [ ] Other Material: [ ] Tank Bottoms TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: ] Production Water ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: (SIGNATURE) 74 Canary - Sundance Acct #1 ン 1 VEHICLE NO .: /*-Sundance Services, Inc. (SIGNATURE) [ ] Drilling Fluids P. O. Box 1737 ★ Eunice, New Mexico 88231 BS&W Content: [] Contaminated Soil TYPE OF MATERIAL Pink - Sundance Acct #2 Vj Nj (505) 394-2511 ÷, Gold - Transporter [] YARD 10.01 DRIVER NO .: [ ] C-117 No.: [ ] Completion Fluids TIME 10 m 10 m 10 m Superior Printing Service, Inc 65559 AM/PM

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<b>.</b>			· · · · · · · · · · · · · · · · · · ·				
	NON-HAZARDOUS WASTE MANIEEST	1. Generator's US EPA ID No. N/A	Manifest Doc. No.	2. Page 1 of			
Â	3. Generator's Name and Mailing Address N 12	ew Mexico Oil Conservation Divisio 220 South St. Francis Drive	n	A WE/4, SE/	raho Dispo 4,Sec 1,T1	sal Facility 7S,R31E	
	4. Generator's Phone ( 476-3488 Si 5. Transporter 1, Company Name		lumber	A. Transport	er's Phonens	207 2044	
	Chapanal Services, Inc.		A	B Transport	er's Phone	-297-2044	
			· · · · ·				
	9. Designated Pacifity Name and Site Address Sundance Services 2 miles East on Hwy 18	N	10. US EPA ID Number C			-394-2511	
	11. Waste Shipping Name and Description			12.	Containers	13. Total	14. Unit
	a. 7 1 1			N	lo. Type	Quantity	Wt/Vol
	Puluced H20/	TANK Bottoms		ļ	Janh	1.30	BBI
G W Z W D	b.						
	c. ;;						
	d			· .			
.e	D. Additional Descriptions for Materials Listed Abov	ve		E. Handling	Codes for Was		
	Non Hazardous	2 <u>-</u>			N/2	<b>A</b>	
	15. Special Handling Instructions and Additional Info	ormation					
	#5 Address: PO Drawer 176	i9, Eunice, NM 88231					
	16. GENERATOR'S CERTIFICATION: I certify the	materials described above on this manifest are not su	ubject to federal regulat	ions for reportir	ng proper dispos	sal of Hazardous Wa	iste.
┥	The states			<u></u>		Month Day	703 703
TRANSP	17. Transporter 1 Acknowledgement of Receipt of M Ornted/Typed Name SELCCO A 12 L 128	Materials Signatore	a Burn	$\geq$		Month Day	Year Ø3
ORTE	18. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name	Materials 7				Month Day	Year
Ŕ	19. Discrepancy Indication Space		·				
F A C							
L       	20. Facility Owner or Operator: Certification of recei	ipt of waste materials covered by this manifest e	except as noted in Ite	əm 19.			
Y	Printed/Typed Name Fubica Februar	Signature	Les top	en la		Month Day	7 0·3
		ORIGINAL – RETURN TO GE	NERATOR				

(SIGNATURE) FACILITY REPRESENTATIVE: (SIGNATURE) White - Sundance Canary - Sundance Acet #1 Pink - Sundance Acet #2 Gold - Transporter Superior Printing Service, 1 Superior Printing Service, 1	THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.	ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH TH JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.	AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH I MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIM TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR	VOLUME OF MATERIAL [] BBLS: [] YARD: []	[] Production Water       [] Drilling Fluids       [] Completion Fluids         [] Tank Bottoms       [] Contaminated Soil       [] C-117 No.:         [] Other Material:       [] BS&W Content:       []	CHARGE TO: / /////////////////////////////////	LEASE NAME: A // D TIME AM/PA TRANSPORTER COMPANY: C DRIVER NO.: DATE: D //7/03 VEHICLE NO.: DRIVER NO.:	Sundance Services, Inc. Mr. 69973 P. O. Box 1737 * Eunice, New Mexico 88231 (505) 394-2511 LEASE OPERATOR/SHIPPER/COMPANY:

	1									
	•	NON-HAZARDOUS	1. Generator's US N/A	EPA ID No.	Manifest Doc. No.	2. Page	1			
	3.	Generator's Name and Mailing Address	New Mexico Oil ( 220 South St. Fr Santa Fe, New Me	Conservation Divisio ancis Drive exico 87505	<u>  · ŀ ŀ ·</u> n	WE/4,	Araho SE/4,Se Lea Co	Dispo c 1,T17 ounty,	sal Facility 7S,R31E NM	
	5.	Transporter 1 Company Name Chaparral Services, Inc.		6. US EPA ID N	lumber A	A. Tran	sporter's P	hone 505-	-397-3044	
	7.	Transporter 2 Company Name		8. US EPA ID N		B. Tran	sporter's P	hone		· · ·
	9.	Designated Facility Name and Site Address		10. US EPA ID N	lumber	C. Facil	ity's Phone		· · · · · · · · · · · · · · · · · · ·	
		- 2 miles East on Hwy 18		N/	/A · · · · · ·			505-	-394-2511	
	11	. Waste Shipping Name and Description					12. Conta No.	ainers Type	13. Total Quantity	14. Unit Wt/Vol
	a.	PRoduced H20/	TANK	Bottoms			<u>†</u>	TANK	- 130	R.R.I
GUNU	b.			ť						5
A T O	c.	1							· ··	
H	d.						·• •		· · · ·	······
	D	Additional Descriptions for Materials Listed Abo	9VC			E. Hand	lling Codes	for Was	tes Listed Above	
		Non Hazardous		1				N/A		
	15	i. Special Handling Instructions and Additional In	formation			J.,			· · · · ·	
		#5 Address: PO Drawer 17	69, Eunice, NM 8	8231						
	10	6. GENERATOR'S CERTIFICATION: 1 certify the	materials described abo	ove on this manifest are not su	ubject to federal regula	ations for re	eporting prop	er dispos	al of Hazardous Wa	aste.
ł		Printed/Typed Name		Signature					Month Day	۲ <u>۲</u> ۰۹۲
TRANSP		Printed/Typed Name	Materials	Signature	Æ		<u> </u>		Month Day	, _{Year} 7 0:5
ORTE	18	. Transporter 2 Acknowledgement of Receipt of Printed/Typed Name	Materials	Signature	· · · · · ·		· · · · ·		Month Day	Year
R	19	Discrepancy Indication Space		<u>l</u>		· · · <del>- · ·</del>	<u> </u>	<u></u>		
F A C I										
L I T V	20	). Facility Owner or Operator: Certification of reco	eipt of waste materials	covered by this manifest e	except as noted in It	em 19.				
Ĺ		Printed/Typed Name ZACKRAMDS		Signature	$k/\!\!\!/$				Month Day	y Year 7 0.3
			ORIGINAL	- RETURN TO GE		المراجع المراجع الأركب المراجع				

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DATE: DRIVER: shipper. This will certify that no additional materials were added to this load, and that the material OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME VOLUME OF MATERIAL K BBLS. White - Sundance Revised 12/27/95 was delivered without incident FACILITY FOR DISPOSAL. JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY GEOTHERMAL ENERGY. ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED [ ] Other Material: [ ] Production Water CHARGE TO: FACILITY REPRESENTATIVE: Transporter Statement at the above described location, and that it was tendered by the above described THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [ ] Tank Bottoms TRANSPORTER COMPANY: / LEASE OPERATOR/SHIPPER/COMPANY: LEASE NAME: ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS Description: THIS WILL CERTIFY that the above Transporter loaded the material represented by this 5 (SIGNATURE) Canary - Sundance Acct #1 VEHICLE NO.: 2 b Sundance Sarvices, Inc. (SIGNATURE) [ ] Contaminated Soil [ ] Drilling Fluids P. O. Box 1737 **★** Eunice, New Mexico 88231 na. ] BS&W Content: TYPE OF MATERIAL Pink - Sundance Acct #2 1 (505) 394-2511 Gold - Transporter ] YARD DRIVER NO .: [ ] Completion Fluids [ ] C-117 No.: TIME 23 Superior Printing Service, Inc. 69976 AM/PM

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	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US E N/A	PA ID No.	Manifest Doc. No.	2. Page of	ə 1			
3.	Generator's Name and Mailing Address	New Mexico Oil Con 1220 South St. Fran	nservation Division cis Drive		WE/4,	Araho SE/4,Se	Dispo c 1,T17	sal Facility 7S,R31E	
4.	. Generator's Priorie ( 4/5-3488	Santa Fe, New Mexi	co 8/505			Lea C	ounty,	NM	
5.	Transporter 1 Company Name Chapanal Services, Inc.	6.	US EPA ID N	umber	A. Trar	nsporter's F	^{&gt;hon} 505-	-397-3044	
7.	. Transporter 2 Company Name	· 8.	US EPA ID N		B. Trar	nsporter's	Phone		
9.	Designated Facility Name and Site Address Sundance Services	10	). US EPA ID N	umber	C. Fac	lity's Phon	e		
	2 miles East on Hwy 18 Lea County		N/A	L <u></u>		-	505-	-394-2511	
1	1. Waste Shipping Name and Description					12. Con	tainers	13. Total	
a	Produced 4 01	Tak Rit	Lami			NO.	Type Anh	Guanuty	
	1 100000 1120	THNIC POIL							10
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d	<b>I.</b>	ſ						· · · ·	
	D. Additional Descriptions for Materials Listed	Above			E. Han	dling Code	s for Wa	stes Listed Ab	iove
	NT TT 1		:						
	Non Hazardous						N/A		
1	5. Special Handling Instructions and Additiona	al Information							
	#5 Address: BO Deserver 1	760 Eurice NIM 990	21						
	#9 Address, PO Liawer 1	709, Eunice, IVM 662.	21						
		, the materials described above	on this manifest are not suit	viect to federal regul	ations for r	eporting or	ner dispo	sal of Hazardou	is Wa
	Printed/Typed Name		Signature			opening pro		Month	Day
<b>V</b>	7. Transporter 1 Acknowledgement of Receipt	t of Materials				<u></u>			
	Printed/Typed Name		Signature	1d.mar				Month	Day
	8. Transporter 2 Acknowledgement of Receipt	t of Materials	- dert	<u>v</u>	• 			10	//
	Printed/Typed Name		Signature			;		Month	Day
R     1'	9. Discrepancy Indication Space	······			<u></u>		·	<u> </u>	
FA									
	20. Facility Owner or Operator: Certification of	receipt of waste materials or	overed by this manifest ex	cept as noted in !	tem 19.				
	Printed/Typed Name		Signature /					Month	Day

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CHARGE TO: White - Sundance Revised 12/27/95 shipper. This will certify that no additional materials were added to this load, and that the material OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S GEOTHERMAL ENERGY. THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME VOLUME OF MATERIAL [2] BELS. [ ] Other Material: [ ] Production Water FACILITY REPRESENTATIVE: DRIVER: was delivered without incident. Transporter Statement at the above described location, and that it was tendered by the above described FACILITY FOR DISPOSAL. JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS [ ] Tank Bottoms DATE TRANSPORTER COMPANY: LEASE NAME: LEASE OPERATOR/SHIPPER/COMPANY: M ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS AS A CONDITION TO SUNDANCE SERVICES, INC. SACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS THIS WILL CERTIFY that the above Transporter loaded the material represented by this Description: 10-17-03 VEHICLE NO .: (SIGNATURE) Canary - Sundance Acct #1 Vimard X + = + 0 Sundance Services, Inc. [ ] Contaminated Soil (SIGNATURE) インシ [ ] Drilling Fluids P. O. Box 1737 ★ Eunice, New Mexico 88231 ] BS&W Content: いったの うちろう 20 TYPE OF MATERIAL Brick Pink - Sundance Acct #2 ₹**0** (4) 10 いまたこうの (505) 394-2511 Ċţ ין ד Gold - Transporter 2 [ ] YARD C. DRIVER NO .: [ ] Completion Fluids [ ] C-117 No.: TIME 2 Superior Printing Service, Inc. 08669 AM/PM

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	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US El N/A	PA ID No.	Manifest Doc. No.	2. Page	1		<u>an an an Arran</u>	
	3. Generator's Name and Mailing Address	New Mexico Oil Co 1220 South St. Fran	onservation Division	n	WE/4	Araho SE/4 Se	Dispo	sal Facility 7S R 31E	
	505 476-3488 4. Generator's Phone ( )	Santa Fe, New Mex	dico 87505 *			Lea Co	ounty,	NM	
	5. Transporter 1 Chaparal a Services, Inc.	6. 	US EPA IBN	umber A	A. Tran	sporter's Pi	^{non} \$05	-397-3044	
	7. Transporter 2 Company Name	8. ]	US EPA ID N	umber	B. Tran	sporter's P	hone		
	9. Designated Starifa Man Sard Riss Address 2 miles East on Hwy 18 Lea County	10	). US EPA ID N N/	umber A	C. Facil	ity's Phone	505	-394-2511	
	11. Waste Shipping Name and Description	<b>_</b>			· ·	12. Conta	ainers	13. Total	14. Unit
	a. PROdUCEC HOO	/TANK	Bottoms	·		/	Harle	- 130	RB/
- GENED	b.					•			54
ATOR	<b>c.</b>				- - 	• •	4. 4	: 	
	d								
	D. Additional Descriptions for Materials Listed At	000			E. Hand	dling Codes	for Was	stes Listed Above	
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	Non Hazardous		3,				N/A	<b>X</b>	
	Non Hazardous 15. Special Handling Instructions and Additional I	nformation	· · · · · · · · · · · · · · · · · · ·				N/A	<b>L</b>	
	Non Hazardous 15. Special Handling Instructions and Additional I #5 Address: PO Drawer 17	nformation 69, Eunice, NM 882	231				N/A	<b>.</b>	
	Non Hazardous 15. Special Handling Instructions and Additional I #5 Address: PO Drawer 17 16. GENERATOR'S CERTIFICATION: 10.000	nformation 69, Eunice, NM 882	231				N/A	al of Hazardoue Wa	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	Non Hazardous 15. Special Handling Instructions and Additional I #5 Address: PO Drawer 17 16. GENERATOR'S CERTIFICATION: 1 certify th Printed/Typed Name	nformation 69, Eunice, NM 882 re materials described above	231 e on this manifest are not su Signature	ubject to federal regula	ations for n	eporting prop	N/A	sal of Hazardous Wa Month Day	ste. Year
	Non Hazardous 15. Special Handling Instructions and Additional I #5 Address: PO Drawer 17 16. GENERATOR'S CERTIFICATION: 1 certify th Printed/Typed Name	nformation 69, Eunice, NM 882 e materials described above	231 e on this manifest are not su Signature	ibject to federal regula	ations for m		N/A	sal of Hazardous Wa Month Day	ste. Year
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ن ا	(505) 394	-2511		77
LEASE OPERATOR/SH	IIPPER/COMPANY:	thing &	nortomen	ta
LEASE NAME:	ato 15WD	<u>,</u>		
TRANSPORTER COM	PANY: Chapana	I I	TIME	AM/PM
DATE: 10/21/03	VEHICLE NO .: # 7	DRIN	/ER NO.:	
CHARGE TO:	Hanond Back	a)		
<u> </u>	TYPE OF M	ATERIAL		
TProduction Water	f 1 Drilling Fluids		[] Completion	: Eluide
LIJank Bottoms	[] Contaminated Soil	·	[] C-117 No.: _	
[] Other Material:	[] BS&W Content:			
Description	alidy			
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THIS WILL CERTL Transporter Statement a shipper. This will certify was delivered without in DRIVER: (SIGNATURE) FACILITY REPRESENTATIVE	FY that the above Transported t the above described location t that no additional materials cident:	r loaded the mater n, and that it was to were added to this	ial representea endered by the cload, and tha	by this above described t the material
White - Sundance Canary - Su Revised 12/27/95	ndance Acct #1 Pink - Sundance Acct	#2 Gold - Transporter	Sup	erior Printing Service, In

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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US	EPA ID No.	• • •	Manifest Doc. No.	2. Page of	ə 1		· · · ·	· ·
	3.	Generator's Name and Mailing Address	New Mexico 1220 South S	Oil Conse t Francis	rvation Di Drive	vision	v	A VE/4, SE	vraho D /4,Sec 1	isposal Facilit I,T17S,R31E	у
	4.	Generator's Priore DUS 440-3488	Sania re, Ne	WMEXICO			<u> </u>	1			
	5.	Transporter 1 Company Name	····	6.	US EPA ID N	lumber	A. Tran	isporter's F	hone	•••	
	7.	Transporter 2 Company Name Services, Inc.		8.	US EPA ID N	lumber	B. Tran	sporter's	Phone	<del>-505-397-304/</del>	<b>↓</b>
	9.	Designated Facility Name and Site Address		10.	US EPA ID N	lumber	C. Faci	lity's Phon	e		
		Sundance Services 2 miles East on Hwy 18	1			N/A				505-394-2511	1 · 1
	11	Waste Shipping Name and Description	L	<u> </u>	• • •	· · · · · ·	I	12. Con	tainers	13.	14.
	''	. Waste Shipping Name and Description						No.	Type	Total Quantity	Unit Wt/Vol
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	d.							· · · · ·			
	D.	Additional Descriptions for Materials Listed Above	)		:	· · · · · · · · · · · · · · · · · · ·	E. Hand	dling Code	s for Wast	es Listed Above	
		Non Hazardous						. •		N/A	
	15	i. Special Handling Instructions and Additional Infon	mation					·			
		#5 Address: PO Drawer 1	1769, Eunice, N	IM 88231							
	16	. GENERATOR'S CERTIFICATION: I certify the ma	aterials described abo	ve on this man	lifest are not su	bject to federal regula	ations for r	eporting pro	per dispos	al of Hazardous Wa	.ste.
		Printed/Typed Name		Sign	nature					Month Day	Year
<u>*</u>	-										<u> </u>
		I transporter 1 Acknowledgement of Heceipt of Ma Printed/Typed Name	terials	Sign		$\sim$				Menth Day	Year
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Q	18	. Transporter ZAcknowledgement of Receipt of Ma	terials	~~	/	(>m		:			
		Printed/Typed Name		Sign	ature				ند <u>،</u>	Month Day	Year
F	19	). Discrepancy Indication Space									
A C I											
	20	- Facility Owner or Operator: Certification of receipt	t of waste materials	covered by t	his manifest e	except as noted in Ite	em 19.	/	- <u>~</u>		
		Printed/Typed Name		Sign		mars	H		22)	Month Day	rear 193
			ORIGINAL -	- RETUR		NERATOR					

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JOB 1 OPER FACII	ALSO AS A ICKET, TR ATOR/SHIP ITY FOR E	CONDITION ANSPORTER PPER TO TRA DISPOSAL.	I TO SUNDAN REPRESENT NSPORTER I	NCE SERVICE: S AND WARRA S NOW DELIV	S, INC.'S AC ANTS THAT ERED BY TI	CEPTANCI ONLY THE RANSPORT	E OF THE MATER TER TO S	I MATERIAL IAL DELIVE UNDANCE S	S SHIPPEL RED BY ERVICES,	INC.'S
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FACI	ITY REPR	ESENTATIV	E: <u>////////////////////////////////////</u>	GNATURE)			~ ~	·~		
	: Sundance	Canary - Su	ndance Acct #1	Pink - Sunda	ince Acct #2	Gold - Tr	ansporter			
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	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US E N/A	EPA ID No.	Manifest Doc. N	o. 2. Pag of	e 1	· .	· .	
3. 6	Senerator's Name and Mailing Address	New Mexico Oil Con 1220 South St. Fran Santa Fe. New Mexi	nservation Divisio cis Drive co 87505	n	WĘ/4,	Araho I SE/4,Sec Lea Cou	)isposal 1,T17S, mtv. NM	Facility R31E vi	
5. T	ransporter 1 Company Name	6	. US EPA II	) Number	A. Trai	nsporter's Pl	none	1.264	:
7. T	ransporter 2 Company Name	8	US EPA I	Number	B. Trai	nsporter's P	<u>-505-39</u> hone	7 3844	
9. [	Designated Facility Name and Site Address	I. Centerator's US EPA ID No. Manifest Dr. No. 2. Page 1     NVA     NVA     Arabo Disposal Facil     Zero Country, NM     Country, NM		;					
	Sundance Services 2 miles East on Hwy 18 Lea County	· . · [	N	/A			505-39	4-2511	-
11. \	Waste Shipping Name and Description					12. Conta No.	ainers Type	13. Total Quantity	14. Unit Wt/Vo
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d.					· .			· · · · ·	
D. /	Additional Descriptions for Materials Listed Non Hazardous	l Above	- - -		E. Han	dling Codes	for Waste N/A	s Listed Above	•
15. \$	Special Handling Instructions and Addition #5 Address: PO Drawer 1	al Information 769, Eunice, NM 882	31					.:	
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16. (	GENERATOR'S CERTIFICATION: 1 certif	y the materials described abov	e on this manifest are no	t subject to federal reg	ulations for a	reporting prop	er disposal	of Hazardous W	aste.
↓   '	Printed/Typed Name		Signature					Month Day	Yez
	Transporter 1 Acknowledgement of Receip Printed/Typed Name Abraham Naverna	ot of Materials	Signature	helan	Alt	ast	Ħ		/ Yea
	Transporter 2 Acknowledgement of Receip Printed/Typed Name	ot of Materials	Signature			·		Month Day	Yee
<b>R</b> 19. (	Discrepancy Indication Space			<u></u>					
FAC	line B: corr	ected guan	tity						
L 20. F	Facility Owner or Operator: Certification of	receipt of waste materials of	covered by this manifes	st except as noted in	Item 19.				
F	Printed/Typed Name	1	Signature	hen Fa	1			Month Day	y Yea 1 0
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LEASE OPERATOR/SI	HIPPER/COMPANY: RI	, Foundate t
LEASE NAME: A	1: SWD	
TRANSPORTER COM	PAN:	TIME AM/
DATE: 191011. 3	VEHICLE NO .: 4 59	DRIVER NO.:
CHARGE TO:	Bismund 1	S. A
	TYPE OF MAT	ERIAL
[] Production Water	[] Drilling Fluids	[] Completion Fluids
[] Tank Bottoms	[] Contaminated Soil	[ ] C-117 No.:
[] Other Material:	[] BS&W Content:	
Description:	Slick	· · · .
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AS A CONDITION TO S JOB TICKET, OPERATOR/SH MATERIAL EXEMPT FROM TO TIME, 40 U.S.C. § 6901, et THERETO BY VIPTUE OF T	SUNDANCE SERVICES, INC.'S ACCEPTA IPPER REPRESENTS AND WARRANTS T THE RESOURCE, CONSERVATION AND seq., THE NM HEALTH AND SAF. CODI	ANCE OF THE MATERIALS SHIPPED WITH THIS THAT THE WASTE MATERIAL SHIPPED HEREWIT RECOVERY ACT OF 1976, AS AMENDED FROM T E § 361.001 et seq., AND REGULATIONS RELATED FLUIDS PRODUCED WATERS AND OTHER WAS
AS A CONDITION TO S JOB TICKET, OPERATOR/SH MATERIAL EXEMPT FROM TO TIME, 40 U.S.C. § 6901, et THERETO, BY VIRTUE OF T ASSOCIATED WITH THE EX GEOTHERMAL ENERGY.	SUNDANCE SERVICES, INC. 'S ACCEPTA IPPER REPRESENTS AND WARRANTS T THE RESOURCE, CONSERVATION AND seq., THE NM HEALTH AND SAF. CODI HE EXEMPTION AFFORDED DRILLING PLORATION, DEVELOPMENT OR PROD	ANCE OF THE MATERIALS SHIPPED WITH THIS THAT THE WASTE MATERIAL SHIPPED HEREWIT RECOVERY ACT OF 1976, AS AMENDED FROM T E § 361.001 et seq., AND REGULATIONS RELATED FLUIDS, PRODUCED WATERS, AND OTHER WAS DUCTION OF CRUDE OIL OR NATURAL GAS OR
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AS A CONDITION TO S JOB TICKET, OPERATOR/SH MATERIAL EXEMPT FROM TO TIME, 40 U.S.C. § 6901, et THERETO, BY VIRTUE OF T ASSOCIATED WITH THE EX GEOTHERMAL ENERGY. ALSO AS A CONDITIO JOB TICKET, TRANSPORTEN OPERATOR/SHIPPER TO TR FACILITY FOR DISPOSAL. THIS WILL CERTI Transporter Statement c shipper. This will certif was delivered without in	AL UTBELS	ANCE OF THE MATERIALS SHIPPED WITH THIS THAT THE WASTE MATERIAL SHIPPED HEREWIT RECOVERY ACT OF 1976, AS AMENDED FROM T E § 361.001 et seq., AND REGULATIONS RELATED FLUIDS, PRODUCED WATERS, AND OTHER WAS DUCTION OF CRUDE OIL OR NATURAL GAS OR CEPTANCE OF THE MATERIALS SHIPPED WITH ONLY THE MATERIAL DELIVERED BY RANSPORTER TO SUNDANCE SERVICES, INC.'S added the material represented by this added the material represented by this added to this load, and that the material
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	NON-HAZARDOUS WASTE MANIFEST	. Generator's US	EPA ID No. N/A	Manifest D	oc. No. 2. P	age 1		· · ·	
3	<ul> <li>Generator's Name and Mailing Address</li> <li>Generator's Phone ( 505 476-3488</li> </ul>	New Mexic 1220 South Santa Fe, N	o Oil Conservatio St. Francis Drive Iew Mexico 8750	on Division 9 5		WE/4,	Araho SE/4,Seo Lea Co	Disposal F 1,T17S,R nunty, NM	acilit 31E
5	5. Transporter 1 Company Name		6. US EPA	ID Number	A. T	ransporter's	Phone	<u>.</u>	
7	<u>Chaparral Services, Inc.</u> 7. Transporter 2 Company Name	<u> </u>	8. US EPA	ID Number	<u>.</u> В. Т	ransporter's	Phone	505-397-	<u>304</u> 4
5	9. Designated Facility Name and Site Address		10. US EP/	ID Number	<u>.</u> С. ғ	acility's Pho	ne	<u>.</u>	<u>.</u>
	Sundance Services 2 miles East on Hwy 18		1					505 204	0511
	Lea County 11. Waste Shipping Name and Description		<u> </u>	<u>· · ·N/A</u>	I	12. Co No.	ntainers	<u>505-394-</u> 13. Total Quantity	2511
	Produced H20 in	Tink	to tom	· · ·		1	TANK	130	
L	b	10101	<u>.</u>		·····	<u> </u>	•	•••	<u>·</u>
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	Non Hazardous		· • • • • •				÷.	N/A	
-	15. Special Handling Instructions and Additional Inform	nation			<b> I</b>				
	#5 Address: PO Drawer	1769, Eunice,	NM 88231						
									- 14/2 01
╞	Printed/Typed Name	enals described ab	Signature	not subject to rede	a regulations r	or reporting p	roper aispo	Month	Day
ŀ	17. Transporter 1 Acknowledgement of Receipt of Mat	erials	<u>_</u>		1		. <u></u>	<u>_</u>	•
	Printed/Typed Name		Signature	h 1				Month	Day <b>Z: [</b>
-	19 Transporter 2 Acknowledgement of Receipt of Mat Printed/Typed Name	erials	Signature	- /	~	· · ·		Month	Day
	19. Discrepancy Indication Space	<u> </u>	<u> </u>	,		<u></u>		<u> </u>	
	20. Facility Owner or Operator: Certification of receipt	of waste materials	s covered by this man $\frac{1}{2}$	ifest except as no	ted in Item 19	). /		k da mite	
		// . 1	Signature	eller k	oach	<u></u>		10	21

₽ ₽	P. O. Box 1737 $\star$ Eunice, New Me: (505) 394-2511 $\frac{1}{7}$	kico 88231	5
LEASE OPERATOR/SH	IPPER/COMPANY:	no Summe	to
LEASE NAME: 4	Aho, Sull		
TRANSPORTER COMF	PANY: Managal	TIME	AM
DATE:	VEHICLE NO:	DRIVER NO.:	
CHARGÉ TO:	Jamond Bach		
	TYPE OF MATER	IAL	
[ ] Production Water	[] Drilling Fluids	[] Completion Flu	uids
Tank Bottoms	[] Contaminated Soil	[ ] C-117 No.:	
[] Other Material:	[] BS&W Content:	· · · · · · · · · · · · · · · · · · ·	
<b>.</b>	- high		
Description:			
VOLUME OF MATERIA	L [] BBLS / 30 ;	[]YARD : [	] ·
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	••	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US F	PA ID No.	Manifest Doc. No.	2. Page of	e 1				
	3. 4.	Generator's Name and Mailing Address 505 476-3488 Generator's Phone ( )	New Mexico Oi 1220 South St. F Santa Fe, New F	Conservation Di Francis Drive Mexico 87505	ivision	w	Aı E/4, SE/ Le	raho Di 4,Sec 1 ra Cour	sposal Fac ,T17S,R31 1ty, NM	ility E	
	5.	Transporter 1 Company Name	MAS 1	US EPA ID	Number	A. Trar	nsporter's F	hone	505-397-3(	 )44	· · ·
	7.	Transporter 2 Company Name		US EPA ID	) Number	B. Trar	nsporter's	Рһопе	<u></u>	/	
÷	9.	Designated Facility Name and Site Address Sundance Services 2 miles East on Hwy 18 Lea County	10	US EPA ID	Number	C. Faci	ility's Phon	9	505-394-21	511	
	11	. Waste Shipping Name and Description	<b>_</b> _	<u>· · · · · · ·</u>		L	12. Con	tainers	13. Totai		14. Unit
	a.	Produced H20/B	tom TH	чк			. /.	Iype	- 130	L	BC
- GENER	b.				······································						
A T O R	C.						••••				
	d.				· .	· .					
	D	Additional Descriptions for Materials Listed Abov	6	: · · · :	· · · · · ·	E. Han	dling Code	s for Was	ates Listed Ab	049	
	15	5. Special Handling Instructions and Additional Info #5 Address: PO Drawer 1	769, Eunice, NM	88231		<u> </u>					
	10	6. GENERATOR'S CERTIFICATION: I certify the n	naterials described above	on this manifest are not	t subject to federal regula	itions for i	reporting pro	per dispo	sal of Hazardou	s Wast	e.
		Printed/Typed Name		Signature					Month	Day	Year
I	1	7. Transporter 1 Acknowledgement of Receipt of M	laterials		· · · · · ·						
ANS		Printed/Typed Name		Signature	H Var	a	2		Month	Day	Year
ÖR	11	3. Transporter 2 Acknowledgement of Receipt of M	laterials					*	<u> </u>		
Ť E R		Printed/Typed Name	<u></u>	Signature		· · ·			Month	Day	Year
F A C	1!	9. Discrepancy Indication Space									
	20	). Facility Owner or Operator: Certification of recei	pt of waste materials c	overed by this manifes	st except as noted in It	em 19.	= /	)			
		Printed/Typed Name	h-	Signature	Leller!	Lo.	od		Month	Day 21	Year Year
			ORIGINAL -	RETURN TO C	ENERATOR	а. А					

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P. O. Bei 177 * Eurice, New Matico 88231 (30) 384-2511 LEASE OPERATORY.SHIPPER/COMPANY: M.	Sundance Services, Inc. Nº 70040
LEASE OPERATOR/SHIPPER/COMPANY:       Khomo Smuthania         LEASE NAME:       A (Abo Sub)         TRANSPORTER COMPANY:       M + S         Management       M + S         DATE:       /0/3/6 5         VEHICLE NO:       H         Ofter Material:       [] Completion Fluids         [] Other Material:       [] Contaminated Soil         [] Other Material:       [] BELS.         Description:       Jund         MATERIAL EXEMPT FROM THE RESOURCE, ONSERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS         MATERIAL EXEMPT FROM THE RESOURCE, ONSERVICES, INC.'S ACCEPTANCE OF OF HE MATERIAL SHIPPED HEREWITHS         MATERIAL EXEMPT FROM THE RESOURCE, CONSERVICES, INC.'S ACCEPTANCE OF OF HE MATERIAL SHIPPED WITH THIS         MATERIAL EXEMPT FROM THE RESOURCE, CONSERVICES, INC.'S ACCEPTANCE OF THE MATERIAL SHIPPED WITH THE SHOW THEATION AND PARCHANTON AND RECOVERS, AND CHER NASTE         ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT ON PRODUCTION OF CRUDE OLL OR NATURAL GAS OR GOTICKET, TRANSPORTER REPRESENTS AND WARANTS THATO ONLY THE MAT	P. O. Box 1737 $\star$ Eunice, New Mexico 88231 (505) 394-2511 2/
LEASE NAME:       A f A ho       Sub         THANSPORTER COMPANY:       M + S       harman       TIME       AM/PM         DATE:       / () () () () () S       VEHICLE NO:       H       7       DRIVER NO:         CHARGE TO:       / () () () () () () () () () () () () ()	LEASE OPERATOR/SHIPPER/COMPANY: Khing Surveyoner 1
TRANSPORTER COMPANY:       M + S       Lagrand       TIME       AM/PM         DATE:       ////////////////////////////////////	LEASE NAME: Araho SWD
DATE: / () / 31/0 3 VEHICLE NO:: # / DRIVER NO::         CHARGE TO:       / CAMPACE CONSTRUCTION OF CONSTRUC	TRANSPORTER COMPANY: M+5 have TIME AM/PM
CHARGE TO:	DATE: 10/21/03 VEHICLE NO .: H 7 DRIVER NO .:
TYPE OF MATERIAL         [] Production Water       [] Contaminated Soil       [] Completion Fluids         [] Tank Bottoms       [] Contaminated Soil       [] C-117 No.:         [] Other Material:       [] BSAW Content:	CHARGE TO: Mammed Each
[] Production Water       [] Jotiling Fluids       [] Completion Fluids         [] Jother Material:       [] Contaminated Soil       [] C-117 No.:         Description:	TYPE OF MATERIAL
Description:	[] Production Water       [] Drilling Fluids       [] Completion Fluids         [-]-Tank Bottoms       [] Contaminated Soil       [] C-117 No.:
VOLUME OF MATERIAL [] BBLS	Description: Jalia Tolor
VOLUME OF MATERIAL [] BBLS.       / 30 : [] YARD : []         AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS         JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS         MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME         TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361,001 et seq., AND REGULATIONS RELATED         THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE         ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR         GEOTHERMAL ENERGY.         ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS         JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY         OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S         FACILITY FOR DISPOSAL.         THIS WILL CERTIFY that the above Transporter loaded the material represented by this         Transporter Statement at the above described location, and that it was tendered by the above described         shipper. This will certify that no additional materials were added to this load, and that the material         WINE -:	
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DRIVER:	THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.
(SIGNATURE) FACILITY REPRESENTATIVE: <u>KEHLy Koach</u> (SIGNATURE) White - Sundance Canary - Sundance Acct #1 Pink - Sundance Acct #2 Gold - Transporter Revised 12/27/95 Superior Printing Service, Inc.	DRIVER: Jeff Kyrnacik. A
(SIGNATURE) White - Sundance Canary - Sundance Acet #1 Pink - Sundance Acet #2 Gold - Transporter Revised 12/27/95 Superior Printing Service, Inc	FACILITY REPRESENTATIVE: KEIL Koach
	(SIGNATURE) White - Sundance Canary - Sundance Acet #1 Pink - Sundance Acet #2 Gold - Transporter Revised 12/27/95 Superior Printing Service, In

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NON-HAZARDOUS WASTE MANIFEST nerator's Name and Mailing Address 505 476-3488 ansporter 1 Company Name - <u>Chaparral Services, Ine</u> ansporter 2 Company Name signated Facility Name and Site Address Sundance Services	1. Generator's L New Mexico 1220 South S Santa Fe, Ne	IS EPA ID No. N/A OII Conservat St. Francis Driv w Mexico 8751 6. US	ion Divisi /e 05	Aanifest Doc. No. . 22. .0n	2. Pag of W		raho Di	sposal Facil	ity
nerator's Name and Mailing Address 505 476-3488 ansporter 1 Company Name <u>Chaparral Services, Ine</u> ansporter 2 Company Name signated Facility Name and Site Address Sundance Services	US     1. Generator's USEPAID No.     Manifest Doc. No.     2. Page 1       ST     1. Second Cl. Conservation Division     Anho Disposal Facility       U20 South St. Francis Drive     Anho Disposal Facility       U88 Santa Fe, New Mexico 37505     I. Transporter's Phone       1000								
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signated Facility Name and Site Address		8. US	EPA ID Nur	nber	B. Trai	nsporter's	Phone	<u> 2117- 197- <del>1</del>17</u>	<u>14</u>
Sundance Services		10. US	EPA ID Nur	nber	C. Fac	ility's Phon	e		
2 miles East on Hwy 18									
Lea County			<u> </u>	√A	Ĺ	12 Con	tainers	505-394-251	1
aste Shipping Name and Description						No.	Type	Total Quantity	
Product of Hop	TANK	Bottom	S			1.	TANK	130	
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		· · · · ·		P. 274-24-4-4-4-	:				
: :						: <b>.</b> .			
· · ·	N-HAZARDOUS       1: Generator's USE PAID No.       Monifest Doc. No. 2: Page 1         arms and Mating Address       New Motico Oil Conservation Division 1220 South St. Francis Drive       Manifest Doc. No. 2: Page 1         505       476-3488       Santa Fe, New Mexico 37505       WE4, SE/4,See 1, 1175,R31E         505       1220 South St. Francis Drive       No. N. 2: Page 1         505       120 South St. Francis Drive       No. N. 2: Page 1         505       120 South St. Francis Drive       No. N. 2: Page 1         505       120 South St. Francis Drive       Sc. 307-304         Company Name       0: US EPA ID Number       Transporter's Prices         Company Name       10: US EPA ID Number       C. Facilitys Phone         Standarce Services       10: US EPA ID Number       C. Facility a Phone         Standarce Services       10: US EPA ID Number       C. Facility a Phone         Standarce Services       10: US EPA ID Number       C. Facility a Phone         Standarce Services       10: US EPA ID Number       C. Facility a Phone         Standarce Services       10: US EPA ID Number       No.         Indicat Doc.       12: Ormainer       Touring         Manne and Description       NA       17: Ormainer         Standarce Services       NA       No. <td></td>								
······································	ZARDOUS       1. Generator's USERA D No.       2. Page 1         MANIFEST       1. Generator's USERA D No.       2. Page 1         Atalian Address       New Mexico Oil Conservation Division       Arabo Disposal Faci WEA, SEA See 1, T175, R31E         476-3488       Santa Fe, New Mexico 87505       WEA SEA See 1, T175, R31E         any Name       6.       USEPA ID Number       A. Transporter's Phone         arrest Starvinges_Ine       Md-S       NA       Starsporter's Phone         arrest Starvinges_Ine       Md-S       NA       Starsporter's Phone         arrest Starvinges_Ine       0.       USEPA ID Number       B. Transporter's Phone         arrest Starvinges_Ine       0.       USEPA ID Number       C. Facility's Phone         arrest Starvinges_Ine       0.       USEPA ID Number       C. Facility's Phone         arrest Starvinges_Ine       NA       1.       Transporter's Phone         arrest Starvinges       1.       NA       Transporter's Phone         arrest Starvinges       1.       Transporter's Phone       Start         arrest Starvinges       1.       Transporter's Phone       Transporter's Phone         arrest Starvinges       1.       Transporter's Phone       Transporter's Phone         arrest Starvinges       1. <td>:</td>	:							
Iditional Descriptions for Materials Listed Abov	US       1. Generator's US EPA ID No.       Mandest Duc. No.       2. Page 1         ST       1. Generator's US EPA ID No.       Ambo Disposal Facility         1220 South St. Francis Drive       Ambo Disposal Facility         188       Santa Fe, New Mexico 37505       WE/4, SE/4, Sec 1, T17S, R31E         180       Santa Fe, New Mexico 37505       A. Transporter's Phone         100       0. US EPA ID Number       A. Transporter's Phone         100       US EPA ID Number       B. Transporter's Phone         100       US EPA ID Number       C. Facility's Phone         110       US EPA ID Number       C. Facility's Phone         110       US EPA ID Number       C. Facility's Phone         111       N/A       Social State         112       Containers       10.         113       N/A       Social State         114       Joint       Joint         115       N/A       Joint         116       Joint       Intersporter's Phone         118       Intersporter's Phone       Intersporter's Phone         119       Social State       Intersporter's Phone         120       TAWL Buffettures       Intersporter's Phone         120       TAWL Buffettures       Inter	ve							
Non Hazardous	1. Generator's USEA ID No.       Manifest Doc. No.       2. Page 1         1       New Mexico Qil Conservation Division 1220 South 5L Francis Drive       Arabo Disposal Faci WE/4, SE/4, Sce 1, TTYS, RS II Lea Country, NM         1       Md-S       6.       US EPA ID Number       A. Transporter's Phone         1       US EPA ID Number       B. Transporter's Phone       SS: 397.30         1       0.       US EPA ID Number       B. Transporter's Phone         1       0.       US EPA ID Number       C. Facility's Phone         1       N/A       505-394-25         1       N/A       700         1       N/A       12. Containers         1       N/A       12. Containers         1       N/A       130         1       No.       Type Quanty         1       No.       Type Quanty         1       No.       Type Quanty         1       N/A       130         1       N/A       N/A         1       Signature       N/A         1								
ecial Handling Instructions and Additional Info	ormation	Generator's US, EPA ID No.       Manifest Doc. No.       2. Page 1         arm Mexico Cill Conservation Division       WH4, SE/4, Sec 1, T1 75, R31E         20 South 51, Francis Drive       WE4, SE/4, Sec 1, T1 75, R31E         Las Country, NM       South 51, Sec 1, Sec 1, T1 75, R31E         Las Country, NM       B. Transporter's Phone         10.       US EPA ID Number       A. Transporter's Phone         10.       US EPA ID Number       C. Facility's Phone         10.       US EPA ID Number       C. Facility's Phone         11.       No.       Type         12.       Containers       Transporter's Phone         13.       US EPA ID Number       C. Facility's Phone         14.       S05-304-251       Transporter's Phone         15.       No.       Type         16.       No.       Type         17.       R. Transporter's Phone       S05-304-251         17.       No.       Type         18.       S05-304-251       S05-304-251         19.       No.       Type         19.       NA       I/A         19.       NA       I/A         19.       I/A       I/A         10.       Signature       Mortin							
// <b>.</b>					2. Page 1 of       Araho Disposal Facility WE/4, SE/4,Sec 1,T17S,R31E Lea County, NM         A. Transporter's Phone       505-397-3044         B. Transporter's Phone       505-394-2511         12. Containers       13. Total Quantity         No.       Type         Quantity       130         E. Handling Codes for Wastes Listed Above         N/A         E. Handling Codes for Wastes Listed Above         N/A         Item 19.         Month         Day         Item 19.				
#5 Address: PO Drawer 1	769, Eunice, N	IM 88231					Araho Disposal Facility E/4, Sec 1, T17S, R31E Lea County, NM r's Phone 505-397-3044 r's Phone hone 505-394-2511 Containers 13. Type Quantity IAJ / 30 IAJ		
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Intel/Typed Name	naterials described a	Dove on this manifest	t are not subje	ect to rederal regula	uons for i	reporting pro	per aispo	Month	Day
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ansporter Acknowledgement of Receipt of M inted/Typed Name	raterials	Signatu	ща ,					Month L	Day
Jeff 16annah			·ffk	hand	•			10	16
ansporter 2 Acknowledgement of Receipt of N	laterials	V							
inted/Typed Name	AZARDOUS       1. Generators USEPAID No.       Manifest Doc. No.       2. Page 1         Ind Mailing Address       New Mexico Oil Conservation Division       Arabo Disposal Facility         1220 South SL Francis Drive       Interpretation Division       Arabo Disposal Facility         1220 South SL Francis Drive       Interpretation Division       Arabo Disposal Facility         1220 South SL Francis Drive       Interpretation Division       Arabo Disposal Facility         apprint Starting       M. See Paulo Number       Interpretation Division       Starts Paulo Number         apprint Starting       M. See Paulo Number       Interpretation Phone       Starts Paulo Number       Interpretation Phone         Name and Stin Address       10.       US EPA ID Number       Interpretation Phone       Starts Paulo Number         Index and Discription       10.       US EPA ID Number       Interpretation Phone       Starts Paulo Number         Index and Discription       10.       US EPA ID Number       Interpretation Phone       Starts Paulo Number         Index and Discription       11.       US EPA ID Number       Interpretation Phone       Starts Paulo Number         Index and Discription       12.       Contrainer       Table Baber Number       Interpretation Phone         Interpretation Phone       11.       Table Baber Numbe	Jay							
screpancy Indication Space								•	
cility Owner or Operator: Certification of receip	pt of waste materia	als covered by this i	manifest exc	ept as noted in Ite	əm 19.				
	-h	Signatu		Q1- 1-2	ere	L			Day
	PROJUCT A Hold Iditional Descriptions for Materials Listed Above Non Hazardous Decial Handling Instructions and Additional Info #5 Address: PO Drawer 1 ENERATOR'S CERTIFICATION: 1 certify the r intert/Typed Name Decial Manual Market ansporter 2 Acknowledgement of Receipt of N inted/Typed Name Screpancy Indication Space Idian Market Screpancy Indication Space	Reduced Hall TANK         Iditional Descriptions for Materials Listed Above         Non Hazardous         Decial Handling Instructions and Additional Information         #5 Address: PO Drawer 1769, Eunice, N         ENERATOR'S CERTIFICATION: 1 certify the materials described a         Intel/Typed Name         Screpancy Indication Space         citility Owner or Operator: Certification of receipt of waste material         inted/Typed Name         Screpancy Indication Space	Image: Stand and Second plant         Product of the second plant         Interview of the second plant <td>Image: Annowing State and States processing and the states of the sta</td> <td>Image: Second State State State       Image: Second State State         Inditional Descriptions for Materials Listed Above       Non Hazardous         Inditional Descriptions for Materials Listed Above       Non Hazardous         Decial Handling Instructions and Additional Information       #5 Address: PO Drawer 1769, Eunice, NM 88231         ENERATOR'S CERTIFICATION: 1 certify the materials described above on this manifest are not subject to federal regula         Image: Transmission State Sta</td> <td>Reducted Harmonia bootspectric         Reducted Harmonia         Reducted Harmonia         Iditional Descriptions for Materials Listed Above         Non Hazardous         Decial Handling Instructions and Additional Information         #5 Address: PO Drawer 1769, Eunice, NM 88231         ENERATOR'S CERTIFICATION: 1 certly the materials described above on this manifest are not subject to federal regulations for programmer of Receipt of Materials         Inted/Typed Name         Signature         Signature</td> <td>No.       Ro Juczi di una una una una una una una una una una</td> <td>No.       Type         PRo ds cz d H 20       TANK BoHHMS         Iditional Descriptions for Materials Listed Above       I.         No.       Type         Iditional Descriptions for Materials Listed Above       E. Handling Codes for Wei         No.       Type         Iditional Descriptions for Materials Listed Above       E. Handling Codes for Wei         No.       Type         Secial Handling Instructions and Additional Information       #5 Address: PO Drawer 1769, Eunice, NM 88231         ENERATOR'S CERTIFICATION:       Lowity the materials described above on this manifest are not subject to federal regulations for reporting proper disponing Proper Name         Image Type Name       Signature         Image Type Name       Signature         Signature       July H Materials         Interd Type Name       Signature         screpancy Indication Space       Signature         screpancy Indication Space       Signature         Signature       Signature         Interd Typed Name       Signature         Interd Typed Name       Signature         Signature       Signature         Interd Typed Name       Signature         Signature       Signature         Signature       Signature         Signature<!--</td--><td>No.       Type       Caunty         The dstate of the second second</td></td>	Image: Annowing State and States processing and the states of the sta	Image: Second State State State       Image: Second State State         Inditional Descriptions for Materials Listed Above       Non Hazardous         Inditional Descriptions for Materials Listed Above       Non Hazardous         Decial Handling Instructions and Additional Information       #5 Address: PO Drawer 1769, Eunice, NM 88231         ENERATOR'S CERTIFICATION: 1 certify the materials described above on this manifest are not subject to federal regula         Image: Transmission State Sta	Reducted Harmonia bootspectric         Reducted Harmonia         Reducted Harmonia         Iditional Descriptions for Materials Listed Above         Non Hazardous         Decial Handling Instructions and Additional Information         #5 Address: PO Drawer 1769, Eunice, NM 88231         ENERATOR'S CERTIFICATION: 1 certly the materials described above on this manifest are not subject to federal regulations for programmer of Receipt of Materials         Inted/Typed Name         Signature         Signature	No.       Ro Juczi di una	No.       Type         PRo ds cz d H 20       TANK BoHHMS         Iditional Descriptions for Materials Listed Above       I.         No.       Type         Iditional Descriptions for Materials Listed Above       E. Handling Codes for Wei         No.       Type         Iditional Descriptions for Materials Listed Above       E. Handling Codes for Wei         No.       Type         Secial Handling Instructions and Additional Information       #5 Address: PO Drawer 1769, Eunice, NM 88231         ENERATOR'S CERTIFICATION:       Lowity the materials described above on this manifest are not subject to federal regulations for reporting proper disponing Proper Name         Image Type Name       Signature         Image Type Name       Signature         Signature       July H Materials         Interd Type Name       Signature         screpancy Indication Space       Signature         screpancy Indication Space       Signature         Signature       Signature         Interd Typed Name       Signature         Interd Typed Name       Signature         Signature       Signature         Interd Typed Name       Signature         Signature       Signature         Signature       Signature         Signature </td <td>No.       Type       Caunty         The dstate of the second second</td>	No.       Type       Caunty         The dstate of the second

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61. T	Sundance Servi	ces, Inc. Mo	69957
	P. O. Box 1737 ★ Eunice, New (505)_394-2511	Mexico 88231	40684
LEASE OPERATOR/SHIPP	ER/COMPANY: Rh'. b		
LEASE NAME: ALCA LO	dioprol	· · · · · · · · · · · · · · · · · · ·	
TRANSPORTER COMPAN	Y: Phis	TIME	AM/PM
DATE: 12/16/02 VEI	HICLE NO.	DRIVER NO.:	·····
CHARGE TO:	upside sett		
	TYPE OF MATE	RIAL	
1 Decision Mater	[] Drilling Elvido	5 1 Com-1050	- Muide
Tank Bottoms	[] Contaminated Soil	[] Completion	
] Other Material:	[] BS&W Content:		
112.11	aderial p		
Description: <u></u> //////	UHS F WHREK		, <u></u> ,
MATERIAL EXEMPT FROM THE R TO TIME, 40 U.S.C. § 6901, et seq., THERETO, BY VIRTUE OF THE EX ASSOCIATED WITH THE EXPLOR GEOTHERMAL ENERGY.	SUNDANCE SERVICES, INC.'S ACC	ECOVERY ACT OF 1976, AS AN § 361.001 et seq., AND REGULA LUIDS, PRODUCED WATERS, A ICTION OF CRUDE OIL OR NAT	IENDED FROM TIME TIONS RELATED AND OTHER WASTE FURAL GAS OR
JOB TICKET, TRANSPORTER REP OPERATOR/SHIPPER TO TRANSPO FACILITY FOR DISPOSAL.	RESENTS AND WARRANTS THAT O ORTER IS NOW DELIVERED BY TR	INLY THE MATERIAL DELIVER	ED BY ERVICES, INC.'S
THIS WILL CERTIFY th Transporter Statement at the shipper. This will certify tha was delivered without incide	hat the above Transporter load above described location, and t no additional materials were nt.	ded the material represent d that it was tendered by t e added to this load, and th	ed by this he above describe hat the material
DRIVER:	> 1P		
FACH IN DEDDECENTATIVE.	(SIGNATURE)		
FACILITY REPRESENTATIVE:	3		
White - Sundance Canary - Sundance Revised 12/27/95	Acct #1 Pink - Sundance Acct #2	Gold - Transporter	superior Printing Service, I

		WASTE MANIFEST	1. Generator's	US EPA ID No. N/A	Manifest	Doc. No. 3.	2. Page of	91				
	3. (	Generator's Name and Mailing Address Generator's Phone ( )	ess New Mexico Oil Conservation Division 1220 South St. Francis Drive Santa Fe, New Mexico 87505				Araho Disposal Facility WE/4, SE/4,Sec 1,T17S,R3 Lea County, NM					
	5. 1	Transporter 1 Company Name 3488		6. US EF	A ID Number		A. Tran	isporter's P	hone	;		
	7. `	Transporter 2 Company Name	8. US EPA ID Number				B. Transporter's Phone					
	9. I	Designated Facility Name and Site Address		10. US EF	A ID Number		C. Faci	lity's Phone	)	· · · · · · · · · · · · · · · · · · ·		
		Sundance Services 2 miles East on Hwy 18		1				•				
	11. \	Lea County Waste Shipping Name and Description	<u></u>		<u> </u>	<u>· · l</u>		12. Cont	ainers	<u>505-394-25</u> 13. Total	1 14. Unit	
	a.	0	- 1			<u></u>		No.	Туре	Quantity	Witvo Da	
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	D.	Additional Descriptions for Materials Listed Above	e				E. Han	L dling Codes	s for Was	tes Listed Abov	9	
		Non Hazardous							••	N/A		
	15.	Special Handling Instructions and Additional Info	rmation									
	15.	Special Handling Instructions and Additional Info #5 Address: PO Drawer	mation 1769, Eunice	, NM 88231								
	15.	Special Handling Instructions and Additional Info #5 Address: PO Drawer	rmation 1769, Eunice	, NM 88231								
	15. 16.	Special Handling Instructions and Additional Info #5 Address: PO Drawer GENERATOR'S CERTIFICATION:   certify the m Parted of yoed Name	rmation 1769, Eunice naterials described	, NM 88231 above on this manifest a Signature	e not subject to fed	eral regulat	ions for r	eporting pro	per dispos	sal of Hazardous V Month D	Vaste. ay Yea	
	15. 16. 17.	Special Handling Instructions and Additional Info #5 Address: PO Drawer GENERATOR'S CERTIFICATION:   certify the m Particular yper Name	rmation 1769, Eunice naterials described laterials	, NM 88231 above on this manifest a Signature Signature	e not subject to fed	eral regulat	ions for r	eporting pro	per dispos	Month D	Vaste. ay Yee S O Ay Yee	
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FANSPORTER FA	15. 16. 17. 18.	Special Handling Instructions and Additional Info #5 Address: PO Drawer GENERATOR'S CERTIFICATION:   certify the m Printed yper Name Transporter / Acknowledgement of Receipt of M Printed Typed Name December 2 Acknowledgement of Receipt of M Printed/Typed Name Discrepancy Indication Space	rmation 1769, Eunice naterials described aterials	, NM 88231 above on this manifest and Signature Signature Signature	e not subject to fed	eral regulat	ions for r	eporting pro	per dispos	Sal of Hazardous V Month D Month D Month D J Month D	Vaste. ay Yeu ay Yeu ay Yeu ay Yeu	
TRANSPORTER FACILLY	15. 16. 17. 18. 19.	Special Handling Instructions and Additional Info #5 Address: PO Drawer GENERATOR'S CERTIFICATION:   certify the m Printed Typed Name Transporter / Acknowledgement of Receipt of M Printed Typed Name Discrepancy Indication Space Facility Owner or Operator: Certification of receipt	rmation 1769, Eunice naterials described aterials aterials	, NM 88231 above on this manifest and Signature Signature Signature	e not subject to fed	eral regulat	ions for r	eporting pro	per dispos	sal of Hazardous V Month D / O   / Month D   / O   J Month D 	Vaste. ay Yez ay Yez ay Yez ay Yez	

	Sundance Servi	ces Inc Ma coo74
	B O Ber 1717 + Engine New 1	LCS, IIIC. (5) [1] 09971
	P. O. Box 1737 = Eunice, New (505) 394-2511	· 93
LEASE OPERATOR	VSHIPPER/COMPANY:	no Crucionaria
LEASE NAME:	Hato Sull,	
TRANSPORTER CO	OMPANY: 14+5 Chay	same) TIME AM
DATE: 6/17/	3 VEHICLE NO .: # 7	DRIVER NO .:
CHARGE TO:	No. 1Red and	
	Mamone Gall Sal	
	TYPE OF MATE	RIAL
[ ] Production Water	[ 1 Drilling Fluide	[ ] Completion Fluids
Mank Bottoms	[] Contaminated Soil	[ ] C-117 No.:
[] Other Material:	[ ] BS&W Content:	• • • • • • • • • • • • • • • • • • • •
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<b>VOLUME OF MATE</b> AS A CONDITION JOB TICKET, OPERATOR MATERIAL EXEMPT FR	TO SUNDANCE SERVICES, INC.'S ACCEPTAN VSHIPPER REPRESENTS AND WARRANTS TH	[] YARD: [] CE OF THE MATERIALS SHIPPED WITH THIS LAT THE WASTE MATERIAL SHIPPED HEREWI ECOVERY ACT OF 1976. AS AMENDED FROM
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AS A CONDITION JOB TICKET, OPERATOR MATERIAL EXEMPT FR TO TIME, 40 U.S.C. § 690 THERETO, BY VIRTUE (	TO SUNDANCE SERVICES, INC.'S ACCEPTAN X/SHIPPER REPRESENTS AND WARRANTS TH OM THE RESOURCE, CONSERVATION AND RI D1, et seq., THE NM HEALTH AND SAF. CODE ( D5 THE FXEMPTION AFFORDED DRILLING FI	[] YARD: [] CE OF THE MATERIALS SHIPPED WITH THIS IAT THE WASTE MATERIAL SHIPPED HEREWI ECOVERY ACT OF 1976, AS AMENDED FROM \$ 361.001 et seq., AND REGULATIONS RELATED JUIDS, PRODUCED WATERS, AND OTHER WA
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<b>VOLUME OF MATE</b> AS A CONDITION JOB TICKET, OPERATOF MATERIAL EXEMPT FRO TO TIME, 40 U.S.C. § 690 THERETO, BY VIRTUE ( ASSOCIATED WITH THE GEOTHERMAL ENERGY	ERIAL [] BBLS: TO SUNDANCE SERVICES, INC.'S ACCEPTAN VSHIPPER REPRESENTS AND WARRANTS TH OM THE RESOURCE, CONSERVATION AND RI 01, et seq., THE NM HEALTH AND SAF. CODE ( 05 F THE EXEMPTION AFFORDED DRILLING FI E EXPLORATION, DEVELOPMENT OR PRODU	[] YARD: [] CE OF THE MATERIALS SHIPPED WITH THIS LAT THE WASTE MATERIAL SHIPPED HEREWI ECOVERY ACT OF 1976, AS AMENDED FROM \$ 361.001 et seq., AND REGULATIONS RELATEJ LUIDS, PRODUCED WATERS, AND OTHER WA CTION OF CRUDE OIL OR NATURAL GAS OR
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<b>#</b> 1			1. Generatoria LIS EPA ID	No	Manifest Dec. No.	2 Roge				
	ŀ	WASTE MANIFEST	N/A		. 24.	2. Page				
	3	Generator's Name and Mailing Address	New Mexico Oil Cons 1220 South St. Francis Santa Fe, New Mexico	Araho Disposal Facility WE/4, SE/4,Sec 1,T17S,R31E Lea County, NM						
	5	. Transporter 1 Company Name	6.	US EPA ID N	umber	A. Tran	sporter's P	hone 50	5 207 2044	<u>·</u>
		Chapanal Services, Inc.	<u>l</u> .	r 	(/A					
	ľ	Sundanae Services	pany Name 8. US EPA ID Number B. Transporter							
	g	Designated Facility Name and Site Address Z IIIICS East Of HWY IS Lea County	10.	US EPA ID N	under	C. Faci	lity's Phone	50	5-394-2511	
			<u> </u>		<u>.</u> .			······································		····
	1	1. Waste Shipping Name and Description					12, Cont No.	ainers     Type	13. Total Ouantity	14. Unit Wt/Vol
	a	TANK Bottoms/	Producted	H20	- <u></u> Fare-alt		J	Tont	130	B.C./
GENE		, , , , , , , , , , , , , , , , , , ,								
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ÓR						:	• ••			
	•	l.			<u></u>					
	1	D. Additional Descriptions for Materials Listed Ab	ove		· · · ·	E. Hand	dling Codes	for Was	tes Listed Above	
		Non Hazardous		÷ <u>;</u>				197	n	
								-		
		5. Special Handling Instructions and Additional I	nformation			<u> </u>			:	
		#5 Address: PO Drawer 1	769 Eunice NM 88231							
			,							
	Ŀ	6. GENERATOR'S CERTIFICATION: I certify the	e materials described above on thi	s manifest are not su	bject to federal regula	tions for r	eporting prop	er dispos	al of Hazardous Wa	ste.
	,	Printed Name		Signature					Month Day	b3
T F	; È	7. Transporter 1 Acknowledgement of Receipt of	Materials	$- \epsilon$	X X				······································	
		Stargio Starcing		Signature	WAR DEST	P			Month Day	Year Q3
POF		8. Transporter 2 Acknowledgement of Receipt of	Materials	$-\mathcal{P}$			·			
T E A		Printed/Typed Name		Signature			••••		Month Day	Year
	ŀ	9. Discrepancy Indication Space								
F A C										· · · · · · · · · · · · · · · · · · ·
		20. Facility Owner or Operator: Certification of rec	eipt of waste materials covered	d by this manifest e	except as noted in Ite	em 19.				
Ý		Printed/Typed Name	-	Signature					Month Day	Year D.P
		HI NAMULY		5-1	$\gamma$					
	- <u>19</u>		ORIGINAL – RET	URN TO GE	NERATOR			i i i i i i i i i i i i i i i i i i i		19 18 18 18 18 18 18 18 18 18 18 18 18 18

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	Sundance Services, Inc. Nº 69952 P. O. Box 1737 * Eunice, New Mexico 88231 (505) 394-2511
	LEASE OPERATOR/SHIPPER/COMPANY: Khina Eneriomental
	TRANSPORTER COMPANY: Chapana TIME AM/PM
	DATE: 10/1003 VEHICLE NO .: # 7/ DRIVER NO .:
• • •	CHARGE TO: Dramond Bach Sar
	TYPE OF MATERIAL
	[] Production Water       [] Drilling Fluids       [] Completion Fluids         [] Qank Bottoms       [] Contaminated Soil       [] C-117 No.:
	[] Other Material: [] BS&W Content:
	Description:
	VOLUME OF MATERIAL []BBLS. 130 : []YARD : []
	JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HEREWITH IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001 et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.
•	ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THI JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S
	FACILITY FOR DISPOSAL.
	THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.
	THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident. DRIVER: (SIGNATURE) FACILITY REPRESENTATIVE:
	THIS WILL CERTIFY that the above Transporter loaded the material represented by this         Transporter Statement at the above described location, and that it was tendered by the above described         shipper. This will certify that no additional materials were added to this load, and that the material         was delivered without incident.         DRIVER:       DRIVER:         DRIVER:       DRIVER:         White - Sundance       Canary - Sundance Acct #1         Pink - Sundance Acct #1       Pink - Sundance Acct #2         Gold - Transporter       Superior Printing Service, Ir

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	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EP	A ID No.	Manifest Doc. No	. 2. Page of	ə 1		•		
	<ol> <li>Generator's Name and Mailing Address</li> <li>Generator's Phone ( )</li> <li>Transporter 1 Co505 (NA/D-3488)</li> </ol>	N/A New Mexico Oil C 1220 South St. Fra Santa Fe, New Me	onservation Div ancis Drive xico 8750200 ur	vision	WE	Ara /4, SE/4, 	ho Dis Sec 1,	posal Fac F17S,R31 <del>y, NM</del>	cility IE	
	7. Transporter 2 Company Name	8		Number	B Tran		hone 5	05-397-3	044	
	9. Designated Facility Name and Site Address	10.	US EPA II	) Number	C. Faci	lity's Phone	)			
	Sundance Services 2 miles East on Hwy 18 11. Waste Shipping Name and Rescription	<u> </u>		N/A		12. Cont	ainers	<u>05-394-2</u> 13. Total	<u>511</u>	14.
	a. Palaced Hall	In b Rott	fan s			No.	Type Marke		ty ク	WINTON BB/
GENE	b.	THE 120/1					•			
RATORI	C. 1		· · · ·						[:]	
	d. :					'•		•		
	D. Additional Descriptions for Materials Listed Abov	ve		· · · · · · · · · · · · · · · · · · ·	E. Hand	dling Codes	for Was	tes Listed A	bove	
	Non Hazardous. 15. Special Handling Instructions and Additional Info	ormation			<u> </u>		]	N/A		
	#5 Address: PO Drawer	1769, Eunice, NM 8	8231					• •		
	16. GENERATOR'S CERTIFICATION: I certify the	materials described above o	n this manifest are not	t subject to federal regul	ations for r	eporting prop	oer dispos	al of Hazard	ous Was	te.
ł	Printed/Typed Name	fatariala	Signature					Month		Year
-RANSPO	Printed Pyped Name Regio GARCIA 18. Transporter 2 Acknowledgement of Receipt of N	Asterials	Signature	$\overline{\mathcal{X}}$		·····		Month	Day	Year
RTER	Printed/Typed Name		Signature	ubba	TID	1	•	Month	Day	Year B
F A C -	19. Discrepancy Indication Space	· 4 2				2				-
	20. Facility Owner or Operator: Certification of recei	pt of waste materials cov	vered by this manifes	et except as noted in I	tem 19.					
	Printed/Typed Name		Signature	1/				Month	Day	, Year とびし
		ORIGINAL – R	ETURN TO G	ENERATOR						

	Sumuance Servic	co, 111C.	09920
	P. O. Box 1737 ★ Eunice, New N	fexico 88231	2
· · · · · · · · · · · · · · · · · · ·	(303) 394-2311		
LEASE OPERATOR/SHI	PPER/COMPANY:		
LEASE NAME: A roh	0 Uisposal		
TRANSPORTER COMPA	NY: (Theopenal	TIME	AM/PM
DATE: 10/16/0 3V	EHICLE NO. 44 1	DRIVER NO.:	-
CHARGE TO:	Lawred Bit		
	TYPE OF MATE	RIAL	
Durdunting Western			
I Tank Bottoms	[] Contaminated Soil	[] Completion Fi	UIDS
[] Other Material:	[] BS&W Content:		
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Description:/	. d S		· · ·
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ALSO AS A CONDITION JOB TICKET, TRANSPORTER R OPERATOR/SHIPPER TO TRAN FACILITY FOR DISPOSAL. THIS WILL CERTIF Transporter Statement at t shipper. This will certify t was delivered without inci ORIVER: (SIGNATURE)	TO SUNDANCE SERVICES, INC.'S ACCE EPRESENTS AND WARRANTS THAT ON SPORTER IS NOW DELIVERED BY TRA Y that the above Transporter loads the above described location, and that no additional materials were ident.	PTANCE OF THE MATERIALS SE LY THE MATERIAL DELIVERED NSPORTER TO SUNDANCE SERV ed the material represented that it was tendered by the o added to this load, and that	IIPPED WITH THIS BY ICES, INC.'S by this above described the material
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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US El	PA ID No.	Manifest Doc. No.	2. Page of	ə 1					
Å	3.	Generator's Name and Mailing Address	N/A	· · · · · ·					<u> </u>			
Ĩ			New Mexico Oil C	onservation Divis	sion	WF/	Arah 4 SE/4 S	o Disp Sec 1 Ti	osal Facility 75 R 31 E			
	4.	Transporter 1 (505	anta Fe. New Me	xico 87505	Number	A		County	, NM			
	] <b>5</b> .	Chongrant Carriage Terr	o.		N/A	A. Iran	isponers P	<u>-50</u> :	5_397_3044			
	7.	Transporter 2 Company Name 1 41000, 1110.	8.	US EPA ID	Númber	B. Iransporter's Phone						
	9.	Designated Facility Name and Site Address	10	. US EPA ID	Number	C. Faci	lity's Phone	Э				
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		Sundance Services		· · · · · · · · · · · · · · · · · · ·	<u>N/A: · · · · · · · · · · · · · · · · · · ·</u>		• •	50;	5-394-2511			
	11	. Waste Shipping Name and Description					12. Cont No	tainers	13. Total Quantity	14. Unit Wt0/ol		
	a.						NU.	Type	Quantity	W/ V01		
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		Non Hazardous						N/	'A			
	15	Special Handling Instructions and Additional Info	ormation									
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		#5 Address: PO Drawer 17	69, Eunice, NM 8	8231								
		GENEDATOR'S CEDTIEICATION		on this manifact are and	eubient to fodem! recut	tions for -	anorting area	nor dicat-	al of Hazardoue Min	Iste		
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Ţ	17	Transporter 1 Acknowledgement of Receipt of N	laterials		101							
A N S		Printed Laped Name		Signature	16-	,			VOV6			
P	18	Transporter 2 Acknowledgement of Receipt of N	Aaterials									
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	19	Discrepancy Indication Space			<b></b>							
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	20	. Facility Owner or Operator: Certification of rece	pt of waste materials co	overed by this manifes	t except as noted in It	em 19. <b>7</b>						
	.	Printed/Typed Name		Signature						Year C		

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·	(505) 394-2511		26
LEASE OPERATOR/SH	IPPER/COMPANY: Phila	1)	
LEASE NAME:	ALD Di-DASAL	- <u>Martin</u>	· ·
TRANSPORTER COMP	ANY: Anony	TIME	AM/I
DATE: TO/103	VEHICLE NO: 11 nd	DRIVER NO .:	
CHARGE TO:	DADER Royle		
·	TYPE OF MATE	RIAL	
[] Production Water	[] Drilling Fluids	[ ] Completion F	luids
[] Tank Bottoms	[] Contaminated Soil	[ ] C-117 No.:	
[ ] Other Material:	[] BS&W Content:		
	u/c		;
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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US	EPA ID No.	Manifect Doc. No.	2. Page of	ə 1		-	
•	3. 4.	Generator's Name and Mailing Address No Generator's Place ( 476-3488 Se	ew Mexico Oil ( 220 South St. Fr anta Fe, New Me	Conservation Divi ancis Drive exico 87505	sion	WE/4,	Araho , SE/4,Se Lea Co	Dispo c 1,T1	sal Facility 78,R31E NM	
	5.	Transporter 1 Company Name		6. US EPA	ID Number	A. Trar	sporter's Pl	hone 505	-307-3044	· .
	7.	Transporter 2 Company Name	·····	8. US EPA	ID Number	B. Trar	isporter's P	hone		
	9.	Designated Facility Name and Site Address		10. US EPA	ID Number	C. Faci	lity's Phone	<u> </u>		
		Sundance Services 2 miles East on Hwy 18		1	N/A			505	-394-2511	
	11	. Waste Shipping Name and Description		<u>.</u>		4	12. Conta No.	ainers Type	13. Total Quantity	14. Unit Wt/Vol
	a.	TANK Butt	un/-	- -			. ( •	Taw)	130	ABI
GWNWD	b.			.: 			• •			
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	d.					<b>X</b> ,	*	•	•••	
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	D.	<ul> <li>Additional Descriptions for Materials Listed Abov</li> </ul>	/6	:		E. Hand	dling Codes	for Was	ites Listed Abov	/e ·
		Non Hazardous						N//	A	
	15	5. Special Handling Instructions and Additional Info	ormation			1				
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		<b>#5</b> Address: PO Drawer 176	9, Eunice, NM 8	88231	÷					
		د								
	16	Printed/Typed Name	naterials described abo	ove on this manifest are r Signature	ot subject to federal regula	ations for n	eporting prop	er dispos	Month D	waste. Day Year
<b> </b> ↓		7 Transporter 1 Astronometer Description	latariale	<u> </u>					<u>l · l</u> _	<u></u>
RAN		Printed/Typed Name	latenals	Signatur	multime	Ð			Month E	Day Year
POR	18	B. Transporter 2 Acknowledgement of Receipt of M	laterials	$\rightarrow$					0	
ËR		Printed/Typed Name	<u></u>	Signature		•. •			Month L	Day Year
FAC	19	<ol> <li>Discrepancy Indication Space</li> </ol>		:				۰.		
	20	). Facility Owner or Operator: Certification of recei	pt of waste materials	s covered by this manif	est except as noted in It	tem 19.	Λ			
Ý		Printed/Typed Name KEILIA ROW	cha an	Signature	ellerbe	ou	d_		Month 1	Day Year D.1 103
			ORIGINAL	- RETURN TO	GENERATOR					

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	Sundance Servic	es, Inc. M2	70043
	P. O. Box 1737 ★ Eunice, New M (505) 394-2511	1exico 88231	· ·
LEASE OPERATOR/SHI	PPER/COMPANY:	ro Emilionial	
LEASE NAME: /-//	ADO SUN	7	
TRANSPORTER COMPA	ANY: <u>Rapane</u>		AM/PM
			=
	rund Dack		<u></u>
	TYPE OF MATE	RIAL	
[] Production Water	[] Drilling Fluids	[] Completion Flu	ids
[] Other Material:	[] BS&W Content:	[]C-11/ NO.:	
Description:	lids	That	
		JUGO	
VOLUME OF MATERIAL	.[]BBLS. /30 :	[]YARD : [	<u></u>
AS A CONDITION TO SUI JOB TICKET, OPERATOR/SHIPF MATERIAL EXEMPT FROM TH TO TIME, 40 U.S.C. § 6901, et se THERETO, BY VIRTUE OF THE ASSOCIATED WITH THE EXPL GEOTHERMAL ENERGY.	NDANCE SERVICES, INC.'S ACCEPTANC PER REPRESENTS AND WARRANTS THA IE RESOURCE, CONSERVATION AND RE eq., THE NM HEALTH AND SAF. CODE § E EXEMPTION AFFORDED DRILLING FL ORATION, DEVELOPMENT OR PRODUC	E OF THE MATERIALS SHIPPED IT THE WASTE MATERIAL SHIPPE COVERY ACT OF 1976, AS AMENI 361.001 et seq., AND REGULATION UIDS, PRODUCED WATERS, AND TION OF CRUDE OIL OR NATURA	WITH THIS ID HEREWITH IS DED FROM TIME IS RELATED OTHER WASTE AL GAS OR
ALSO AS A CONDITION JOB TICKET, TRANSPORTER R OPERATOR/SHIPPER TO TRAN FACILITY FOR DISPOSAL.	TO SUNDANCE SERVÍCES, INC.'S ACCE EPRESENTS AND WARRANTS THAT ON ISPORTER IS NOW DELIVERED BY TRA	PTANCE OF THE MATERIALS SH LY THE MATERIAL DELIVERED F NSPORTER TO SUNDANCE SERVI	PPED WITH THI }Y CES, INC.'S
THIS WILL CERTIF Transporter Statement at a shipper. This will certify t was delivered without inci	Y that the above Transporter loade the above described location, and that no additional materials were a ident.	ed the material represented b that it was tendered by the a added to this load, and that t	y this bove describe he material
	D (Juli guo -		
FACILITY REPRESENTATIVE:	Signature)		<u> </u>
White - Sundance Canary - Sund Revised 12/27/95	ance Acct #1 Pink - Sundance Acct #2	Gold - Transporter Superio	or Printing Service, I
	. (FR)+- ****	~~~~~	

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	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EF	PA ID No.	Manifest	S. No.	2. Page of	ə 1		
3. Gene 4. Gene	rator's Name and Mailing Address	New Mexico Oil 1220 South St F Santa Fe, New M	Conservation Di Francis Drive Mexico 87505	ivision	-	W	A E/4, SE/	raho D 4,Sec ea Cou	bisposal Facili 1,T17S,R31E unty, NM
5. Trans	sporter 1 Company Name	6. I	US EPA ID	Number	4	A. Tran	isporter's F	Phone	
7. Trans	Chaparral Services, Inc. sporter 2 Company Name	8.	US EPA ID	<u>N/A</u>		3. Tran	isporter's	Phone	<u>505-397-304</u>
9. Desig	nated Facility Name and Site Address	<b>1</b> 0.	US EPA ID	Number		C. Faci	lity's Phon	e	
	Sundance Services 2 miles East on Hwy 18	·	<u></u>	. N/A					505-394-251
11. Wast	e Shipping Main APPOSscription						12. Con No.	tainers Type	13. Total Quantity
a. P	roduced HZO	/Tawx	bo thom	8				TANL BB	110
g b. E									
E	· · ·						•••		
A C. 1. T D R			· .						
d.	• •								
D. Addit	tional Descriptions for Materials Listed Abov	/8				E. Han	Ldling Code	s for Wa	stes Listed Above
	Non Hazardous							•	N/A
15. Spec	cial Handling Instructions and Additional Info	ormation			l			. ,	
		·							·
	45 A 14-000 DO DO	1760 Ennice NM	99121				· .		
	#5 Address: PO Drawer	1709, Eulice, Ivivi	.002.31						· ·
16. GEN	ERATOR'S CERTIFICATION: I certify the r	naterials described above	on this manifest are not	subject to feder	al regulati	ons for r	eporting pro	per dispo	osal of Hazardous V
Print	ed/lyped Name		Signature		·				
T 17. Tran	sporter 1 Acknowledgement of Receipt of N	Aaterials	/						
	ed/Typed Name	retty	Simeric	XA	ztek	les	z L	as	Month Di
D 18. Tran R T Print	sporter 2 Acknowledgement of Receipt of N ed/Typed Name	Aateriais	Signature	<u>.</u>					Month D
19. Disc	repancy Indication Space				<u> </u>				
F A C									
L 20. Facil	ity Owner or Operator: Certification of recei	pt of waste materials co	vered by this manifes	t except as not	ted in Iter	m 19.	^		
Print	ed/Typed Name		Signature	(1)	1				Month D

	P. O. Box 1737 ★ Eunice, New Mex	<b>S</b> , <b>IIIC.</b>	10045
· · · · · · · · · · · · · · · · · · ·	(505) 394-2511	<u> </u>	8
LEASE OPERATOR/SHI	PPER/COMPANY: Jhin	o Environta	プ
LEASE NAME: 4/11	the swo		
TRANSPORTER COMP	INY: Pate	TIME	AM/PM
DATE: 10/21/03 V	/EHICLE NO.: <u></u>	DRIVER NO.:	
CHARGE TO:	Mannal Back		
	TYPE OF MATER	IAL	
[] Production Water 54 Tank Bottoms [] Other Material:	[ ] Drilling Fluids         [ ] Contaminated Soil         [ ] BS&W Content:	[ ] Completion Fil [ ] C-117 No.:	uids
Description:	-lid	Tetou	4
	I IBB/S (IIC)		1
JOB TICKET, OPERATOR/SHIPI MATERIAL EXEMPT FROM TH TO TIME, 40 U.S.C. § 6901, et se THERETO, BY VIRTUE OF THE ASSOCIATED WITH THE EXPL GEOTHERMAL ENERGY. ALSO AS A CONDITION JOB TICKET, TRANSPORTER R OPERATOR/SHIPPER TO TRAN FACILITY FOR DISPOSAL.	PER REPRESENTS AND WARRANTS THAT E RESOURCE, CONSERVATION AND RECO q., THE NM HEALTH AND SAF. CODE § 36 EXEMPTION AFFORDED DRILLING FLUI ORATION, DEVELOPMENT OR PRODUCTI TO SUNDANCE SERVICES, INC.'S ACCEPT EPRESENTS AND WARRANTS THAT ONLY SPORTER IS NOW DELIVERED BY TRANS	THE WASTE MATERIAL SHIPP OVERY ACT OF 1976, AS AMEN 0.001 et seq., AND REGULATION DS, PRODUCED WATERS, AND 00N OF CRUDE OIL OR NATUR ANCE OF THE MATERIALS SH 7 THE MATERIAL DELIVERED PORTER TO SUNDANCE SERV	ED HEREWITH IS DED FROM TIME NS RELATED OTHER WASTE AL GAS OR HIPPED WITH THIS BY ICES, INC.'S
THIS WILL CERTIF Transporter Statement at a shipper. This will certify a was delivered without incl DRIVER:	Y that the above Transporter loaded the above described location, and the that no additional materials were and ident.	the material represented to the twas tendered by the d lded to this load, and that	by this above described the material
FACILITY REPRESENTATIVE:	FIFTING BOUL		

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ļ	NON-HAZARDOUS WASTE MANIFEST	1. Generator's US	SEPA ID No.	Manifest Doc.	No. 2. Pag of	je 1		· · ·	
	3. Generator's Name and Mailing Address	N/	A		·	l		- <u>-</u>	
		New Mexico O	il Conservation	Division		Ага	ho Dis	posal Facility	v
Ľ	4. Generator's Phone ( )	1220 South St.	Francis Drive	·	WE	/4, SE/4	,Sec 1,	T17S,R31E	
	5. Transporter 1 Company Name-3488	Santa Fe, New	Nexico 8\665	PA ID Number	A. Tra	nsporterSi	nohem	<b>су, NM</b>	••,
	7. Transporter 2 Companyan Services, Inc.	· · · · ·	8. USE	PA ID Number	B. Tra	nsporter's	Phone 5	05-397-3044	
	9. Designated Facility Name and Site Address		10. US E	PA ID Number	C. Fac	ility's Phon	e		-
	Sundance Services		ł.			۰.	-		
	2 miles East on Hwy 18 11. Waste Shipping Name and Description		••••	<u>N/A</u>	<u> </u>	12. Con	tainers	05-394-2511	
	nea Caniny					No.	Type	Quantity	
	. Hydro carbon	impact	ed S	orl			Bond	130	
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	d.	· · · · ·					:	·····	-
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	D. Additional Descriptions for Materials Listed Abov	/8			E. Har	dling Code	s for Was	stes Listed Above	e
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	P. O. Box 1737 ★ Eunice, Ne (505) 394-251	w Mexico 88231	70051
LEASE OPERATOR/SHI	PPER/COMPANY:		
	1 Den 1	2	
TRANSPORTER COMPA	NY:	TIME	AM/PM
DATE:	EHICLE NO.: # 741	DRIVER NO.:	
CHARGE TO:	Reel Back		
	TYPE OF MAT	TERIAL	
] Production Water LTank Bottoms ] Other Material:	[ ] Drilling Fluids [ ] Contaminated Soil [ ] BS&W Content:	[ ] Complet [ ] C-117 No	ion Fluids o.:
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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA	A ID No.	Manifest Doc. No.	2. Page of	ə 1			
	3.	Generator's Name and Mailing Address	N/A	•••••			l			
	4.	Generator's Phone ( )	New Mexico Oil C 1220 South St. Fra	Conservation Div	ision	W	An E/4, SE/4	aho Di I,Sec 1	sposal Facility T17S,R31E	
	5.	Transporter 1 Configeby Nathe6-3488	Santa Fe, New Me	EXICO 8 (30EPA ID I	Number	A. Tran	sporter's P	a Com hone	ity, NM	×.
	7.	Transporter 2 Company Services, Inc.	 8. 	US EPA ID I	NUMBER	B. Tran	isporter's F	Phone	<del>505-397-3044</del> -	- <del>1</del>
	9.	Designated Facility Name and Site Address	Number	C. Faci	lity's Phone	•	<u>.</u>			
		Sundance Services 2 miles East on Hwy 18	<u>· N/A · · · · · · · · · · · · · · · · · · ·</u>		12 Cont	ainers	505-394-2511	14		
	11	. Waste Shipping Name and Description			*.		No.	Type	Total Quantity	Unit Wt/Vol
	a.	PROduced H20 / 7	ANK Bath	oms			1.	TANK	130	BBL
GEN	b.	2	7110 1 100 17		······································					
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	D.	Additional Descriptions for Materials Listed Abov	9	:	· · · · · · · · · · · · · · · · · · ·	E. Hand	dling Codes	s for Was	stes Listed Above	
		,								
		Non Hazardous			-				N/A	2.
	15	<ol> <li>Special Handling Instructions and Additional Info</li> </ol>	mation	•						
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		#5 Address: PO Drawer	769, Eunice, NM 8	8231						•
	16	6. GENERATOR'S CERTIFICATION: 1 certify the m	aterials described above o	n this manifest are not s	ubject to federal regula	tions for r	eporting prop	per dispos	sal of Hazardous Wa	ste.
		Printed Weed Name		Signature					Month Day	Year D.3
Ţ	17	7. Transporter 1 Acknowledgement of Receipt of M	aterials			/				
		Printed yped Name		Signature		2			Month Day	Vear 3
Б Ŗ	18	Transporter 2 Acknowledgement of Receipt of M     Printed/Typed Name	aterials	Cignoture			·	·····	Month Day	Vear
Ė R	<u> </u>		•	Signature						
	19	). Discrepancy Indication Space								
F A C			1							
	20	. Facility Owner or Operator: Certification of receip	t of waste materials cov	ered by this manifest	except as noted in It	em 19.				
ſ		Printed Typed Name		Signature	45		وجون. مرجع مسمس		Month Day	Year D:5
4 - C			ORIGINAL – R		NERATOR					

	P. O. Box 1737 ★ Eunice, New N (505) 394-2511	Ces, Inc. Ma Mexico 88231	<b>69949</b> 70
LEASE OPERATOR/SHI	PPER/COMPANY: Klim	O commant	
LEASE NAME: / Iran	ho sub	<u>,                                     </u>	· · · · · · · · · · · · · · · · · · ·
TRANSPORTER COMP	ANY: Chapanal	ТІМЕ	AM/PI
DATE: 10/10/05	EHICLE NO .: # 11	DRIVER NO.:	
CHARGE TO:	iamond Back 34	1	
(	TYPE OF MATE	RIAL	
[] Production Water	[] Drilling Fluids	[] Completion	Fluids
Tank Bottoms	[] Contaminated Soil	[ ] C-117 No.: _	
[] Other Material:	[] BS&W Content:		
Description: 50	lds		•
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## Attachment E

Attachment E Waste Disposal Manifest – Tank Contents - Solids

I.

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		NON-HAZARDOUS	1. Generator's US EPA I	ID No.	Manifest Doc. No.	2. Page 1		, në një njëtë		98 <b>4</b> 40	
	3. 6	WASIE WANIFESI	N/A	· · · · ·	<u> </u>						
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	5. T	ransporter 1 Company Name Phina Entriconmental Servi	6. Incerting	US EPA ID N	Number N/A	A. Transport	ter's Pho	ne 505-	307-3044		
	7. T	ransporter 2 Company Name	8.	US EPA ID N	11741 . Jumber	B. Transport	er's Pho	one			
		· · · · · · · · · · · · · · · · · · ·	L .		<u>.</u> .						
	9. C	Designated Facility Name and Site Address Rhino Environmental Servic Goo-Yea South	10. es, Inc. OCD	US EPA ID N	lumber	C. Facility's	Phone		÷,		
		8 miles south of Hobbs on h	wy 18	N	/A	5	05-247	-4646			
	11. V	Vaste Shipping Name and Description	<b>k</b>	<u></u>		12.	Contair	ners	13. Total		14. Unit
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	D. 4	Additional Descriptions for Materials Listed Abor	ve			E. Handling	Codes fo	or Wast	es Listed At	ove	
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		Non Hazardous						N/A	•		
	15. 9	Special Handling Instructions and Additional Info	ormation								
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	16. C	GENERATOR'S CERTIFICATION: I certify the r Printed/Typed Name	materials described above on t	this manifest are not su Signature	ubject to federal regula	tions for reporti	ng proper	disposa	I of Hazardo	US Waste	e. Vear
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ÂN		Printed Pyped Name		Signature		$\rho^{-}$	-		Month	Day	Year
S P O		Fansporter 2 Acknowledgement of Receipt of A	<u>/ / / / / / / / / / / / / / / / / / / </u>	$\perp q^{c}$	-20	<u> </u>		•	<u> </u>	12	
ŘTER	F	Printed/Typed Name		Signature					Month	Day	Year
	19. [	Discrepancy Indication Space							_		:
FAC		#5 Address: PO Box 57180,	Albuquerque, NM 8	7187							
- L   T V	20. F	Facility Owner or Operator: Certification of recei	pt of waste materials cover	ed by this manifest e	except as noted in It	em 19.					
	F	Printed/Freed Name / Harnson		Signature	chan				Month	23 23	Year 63
Prin Nee	têd by . nah, W	L J NELLER FASSOCIATES INC. 154957-0368	ORIGINAL – RE		NERATOR			12,6	9LS-C5	lev.	12/98

	NON-HAZARDOUS 1. Gen	erator's US EPA ID No. Manifest Do	c. No. 2. Page 1	
Ļ	WASTE MANIFEST	<u>N/A</u>	of	
	3. Generator's Name and Mailing Address			
	New Mex	ico Oil Conservation Division	Araho D	risposal Facility
	4. Generator's Physe ( 177 p.)	th St. Francis Drive	NE/4, SE/4,	Sec-1,T17S,R31E
$\mathbf{F}$	5 Transporter 1 Company Name	New Mexico 87505	A Transporter's Pho	nty, NM
	Rhino Environmental Services Inc			505-207-2044
	7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Pho	one
		<u> </u>		
	9. Designated Facility Name and Site Address	10. US EPA ID Number	C. Facility's Phone	
	Rhino Environmental Services, Inc. (	DCD		
	Goo-Yea South 8 miles south of Hobbs on hung 18	Т Т/А ·	505 247	1616
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	11. Waste Snipping Name and Description		No	Total U
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				1709
	D. Additional Descriptions for Materials Listed Above	:	E. Handling Codes for	or Wastes Listed Above
				NT/A
	Non Hazardous			N/A
	Non Hazardous 15. Special Handling Instructions and Additional Information			N/A
	Non Hazardous 15. Special Handling Instructions and Additional Information			N/A
k	Non Hazardous 15. Special Handling Instructions and Additional Information			N/A
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	Non Hazardous 15. Special Handling Instructions and Additional Information 16. GENERATOR'S CERTIFICATION:   certify the materials d	escribed above on this manifest are not subject to federa	I regulations for reporting proper	N/A disposal of Hazardous Waste.
	Non Hazardous 15. Special Handling Instructions and Additional Information 16. GENERATOR'S CERTIFICATION: 1 certify the materials d Printed/Typed Name	escribed above on this manifest are not subject to federa Signature	I regulations for reporting proper	N/A disposal of Hazardous Waste. Month Day
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		NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EP	A ID No	Manifest Doc. No.	2. Page 1 of			
	3.	Generator's Name and Mailing Address						······································	
			New Mexico Oil C	onservation Divi	sion		Araho	Disposal Facili	ty i
	4	Generator's Phone (	1220 South St. Fra	ncis Drive		N	E/4, SE/4	4,Sec 1,T17S,R	31E
	5	Transporter 1 Company Name	Santa Fe, New Me	XICO 8/505	Number		Lea Co		
	".	Rhino Environmental Se	nvices Inc		N/A			505-397-304	4
	7.	Transporter 2 Company Name	8.	US EPA ID	Number	B. Transpol	ter's Pho	ne	
			<u> </u>	• • • • • •					
	9.	Designated Facility Name and Site Address	10.	US EPA ID	Number	C. Facility's	Phone		
		Rhino Environmental Serv	rices, Inc. OCD						
		Goo-Yea South	herer 19		NI/A		505-24	7-4646	
	-	a miles south of Hoods on		• • • • • •		12	Containe	are 13	14
	1	. Waste Shipping Name and Description					No IT	VDe Quantity	Unit
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ģ.		Additional Descriptions for Materials Listed Abc	ve	:		E. Handling	Codes for	Wastes Listed Abo	ove l
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	1	6. GENERATOR'S CERTIFICATION: 1 certify the	materials described above of	on this manifest are not :	subject to federal regula	ations for report	ing proper o	tisposal of Hazardous	s Waste.
		Printed/Typed Name		Signature				Month	Day Year
		Transporter 1 Acknowledgement of Receipt of	Materials	<u> </u>	· · · · · · · · · · · · · · · · · · ·			<u>_</u> _	<u> </u>
Ŕ	<u> </u>	Printed/Typed Name		Signature	7		7	Month	Dan Year
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D D D	1	3. Transporter 2 Acknowledgement of Receipt of	Materials		$\mathcal{O}$				
Î		Printed/Typed Name		Signature				Month	Day Year
R	\$   								· · ·
	1	<ol> <li>Discrepancy Indication Space</li> </ol>							
F		#5 Address: PO Box 5718	80, Albuquerque, N	M 87187					B. san Loo
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	2	). Facility Owner or Operator: Certification of rece	ipt of waste materials cov	vered by this manifest	except as noted in It	em 19.			
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	1	Printed/Typed Name		Signatiure	a fill a			Month	Day Year
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	¢۴	NON-HAZARDOUS	1. Generator's US EPA ID N	No. Manifes	st Doc. No.	2. Page 1			
	3	3. Generator's Name and Mailing Address	<u>N/A</u>	<u></u>		01	L		
		1	New Mexico Oil Conse 1220 South St. Francis	rvation Division		/ NE/	Araho Disp 4 SE/4 Se	osal Facility c 1 T17S R 311	
	4	4. Generator's Phose 5 476-8488	Santa Fe, New Mexico	87505		1 	ea Count	y, NM	
1		5. Transporter 1 Company Name Rhino Environmental Ser	6. vices, Inc.	US EPA ID Number	N/A	A. Transporte	r's Phone 50	)5-397 <b>-30</b> 44	đư ti
	7	7. Transporter 2 Company Name	8.	US EPA ID Number		B. Transporte	r's Phone		
4	5	9. Designated Facility Name and Site Address Rhino Environmental Servi	10.	US EPA ID Number		C. Facility's P	hone		
		Goo-Yea South	http://www.19	NI/A			505-217-16	16	
	-	11. Waste Shipping Name and Description			•••	- 12.	Containers	13. Tatal	14.
10-4-5T		·····	4			No	o. Type	l otal Quantity	Unit Wt/Vol
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1. A.		D. Additional Descriptions for Materials Listed Abov	e			E. Handling C	odes for Was	tes Listed Above	
		Non Hazardous					N	/A	
		To. Special manuling instructions and Auditional inic	maion						
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		16. GENERATOR'S CERTIFICATION: I certify the n	naterials described above on this	manifest are not subject to fi	ederai regula	tions for reporting	g proper dispos	sal of Hazardous Wa	ste.
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TRA	i  -	17. Transporter 1 Acknowledgement of Receipt of M Printed/Typed Name	aterials	Signature		$\sim$		Month Dav	Year
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O A T E	-	18. Transporter 2 Acknowledgement of Receipt of M Printed/Typed Name	laterials	Signature	0			Month Day	Year
	i	19. Discrepancy Indication Space		<u></u>		<u> </u>	<del></del>		
FAC		#5 Address: PO Box 57180	), Albuquerque, NM 87	187					
		20. Facility Owner or Operator: Certification of recei	ot of waste materials covered	by this manifest except as	s noted in Ite	əm 19.			2.00.00.2.2
A LEAST		Printed/Typed Name		Signature	$\frac{1}{2}$			Month Day	, _{Year} 203
Pri Ne	nte ene	od by U. J. KELLER CASOCIATES INC.	ORIGINAL - RET		ATOR		12	BLS-C5 Rev	12/98

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	WASTE MANIFEST	1. Generator's US			2. Page 1 of			
	Generator's Name and Mailing Address	New Mexico O 1220 South St.	il Conservation Div Francis Drive	rision	NE	Araho Di 5/4, SE/4,S	sposal Facility Sec 1, T17S, R3	IE
	Transporter 1 Company Name	Santa re, New		Number	A Transporte	Lea Coun	ity, NM	
	Rhino Environmental Ser	vices, Inc.		N/A		4	505-397-3044	
	7. Transporter 2 Company Name		8. US EPA ID	Number	B. Transporte	er's Phone	· · · · · · · · · · · · · · · · · · ·	
	9. Designated Facility Name and Site Address Rhino Environmental Servi Goo-Yea South 8 miles south of Hobbs on	ices, Inc. OCD hwy 18	10. US EPA ID	Number	C. Facility's P	hone		
	Lea County			N/A	12.	Gentainers-4	<b>646</b> 13.	14.
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	Non Hazardous 15. Special Handling Instructions and Additional Infor	mation			<u>t.</u>	<u>f</u>	<u>√/</u> A	
	16. GENERATOR'S CERTIFICATION: 1 certify the m	aterials described abo	ove on this manifest are not	subject to federal regula	tions for reporting	g proper dispos	sal of Hazardous W	aste.
	Printed/Typed Name		Signature			······································	Month Day	/ Year
TRAZSP	17. Transporter 1 Acknowledgement of Receipt of Ma	aterials	Signature	el ahio	rodo		Month Bay	(4 <i>0</i> 3
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F A C -	#5 Address: PO Box 57180	), Albuquerque	, NM 87187					
	20. Facility Owner or Operator: Certification of receip	t of waste materials	covered by this manifest	except as noted in It	em 19.			
Pitri	Printed/Typed Name LINSEL DUC arby J. J. KELLEN & ASSOCIATES (NG.			eyt			Month Da	y _{Year} 4 03
Neo	nain, WI 54957-0369	ORIGINAL	- RETURN TO G	ENERATOR		12-	oro-ca uel	1430

NON-HAZARDOUS     1. Generator's US EPA D No.     Mantest Do. No. 2. Page 1       2. Generator's Nume and Maing Addexes     No.     Anabo Disposed Fecility       3. Generator's Nume and Maing Addexes     New Medice 037605     Anabo Disposed Fecility       4. Generator's Photo Environmental Services, Inc.     US EPA D Number     A. Transporter's Proces       5. Transporter 1 Conteary Nume     6.     US EPA D Number     B. Transporter's Proces       7. Transporter 2 Company Nume     6.     US EPA D Number     B. Transporter's Proces       8. Designation Facility Name and Sea Address     10.     US EPA D Number     B. Transporter's Proces       9. Designation Facility Name and Sea Address     10.     US EPA D Number     C. Facility's Phone       8. Disposed Facility Name and Sea Address     Invice Mathese Services, Inc.     0.     US EPA D Number     C. Facility's Phone       8. Disposed Facility Name and Sea Address     N/A     So5-247-4646     No.       11. Waters Studied Mathematics Services, Inc.     0.     US EPA D Number     C. Facility's Phone       11. Waters Studied Name     11.     15.     15.     15.       12. Doll O F     M1 WALL     50.     15.     15.       13. Database Facility Name     15.     15.     15.       14. Doll O F     M1 WALL     15.     15.       15. Generato	herit	-	The source of the second s	1				1 . Par Burge Pr		ويودي کې د دې	Report States and	
NON-YAZARDOUS     1. Generators USERAID N.     Martest Dor. No.     2. Page 1       0     3. Generators Name and Maing Adduss     New Modico Oil Conservation Division     Arabo Disposal Facility       4. Generators Pipods (ATS-JAB     Services, Inc.     Inc.     Arabo Disposal Facility       5. Tremporter Company Name     6. USERAID Number     A. Transporter Proto     S03-307-404       7. Temporter Company Name     6. USERAID Number     A. Transporter Proto     S03-307-404       8. Designated Facily Name and Ster Address     10. USERAID Number     C. Facility Phones       8. Designated Facily Name and Ster Address     10. USERAID Number     C. Facility Phones       8. Designated Facily Name and Ster Address     10. USERAID Number     C. Facility Phones       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       11. Wate Ster Mol Chobs on Invy 18     N/A     S05-247-4646       12. Center Fore Mol Chobs on Invy 18     <			N. S. S.									
WASTE MANUFEST     N/A     of       1     New Mesico Oli Conservation Division 1200 South St. Francis Division Rhino Environmental Services, Inc.     N/A     Artho Disposal Facility I-CA SULASE LITTRESTE Las Comments Protein       5     Transcore / Company Nume     6.     US EPA (D Nurbar     A. Transporter's Protein       7. Transporter / Soromany Nume     6.     US EPA (D Nurbar     A. Transporter's Protein       7. Transporter / Soromany Nume     6.     US EPA (D Nurbar     A. Transporter's Protein       8. Occessor / Soromany Nume     6.     US EPA (D Nurbar     A. Transporter's Protein       9. Decompany Nume     6.     US EPA (D Nurbar     A. Transporter's Protein       10. Decompany Nume     6.     US EPA (D Nurbar     C. Fasility Protein       11. Waters Solution of Hobbs on Nump 18     N/A     505-327-4646       11. Waters Solution of Hobbs on Nump 18     N/A     505-327-4646       11. Waters Solution of Hobbs on Nump 18     N/A     505-327-4646       11. Waters Solution of Hobbs on Nump 18     N/A     505-327-4646       12. C. C. C. Y. J.		24.8	NON-HAZARDOUS	1. Generator's	US EPA ID No		Manifest Doc. No.	2. Page 1	3. A.			
			WASTE MANIFEST	N/	A	· · · · ·	<u>.</u>	of				
New Modeloo Cal Conservation. Division     Actab Disposed Facility       4. Generator's FUG9 (476-3488)     Santa Fe, New Medico 87605     NE(4, 52/4, 50-1, 175, 78, 115)       5. Transporter 1 Company Name     6.     US EPA ID Number     N/A       7. Transporter 2 Company Name     8.     US EPA ID Number     8.       8. Despatie Facility     10.     US EPA ID Number     8.     Transporter 2 Company Name       9. Despatie Facility Name and Beardons     10.     US EPA ID Number     8.     Transporter 2 Company Name       9. Despatie Facility Name and Beardons     10.     US EPA ID Number     8.     Transporter 2 Company Name       9. Despatie Facility Name and Beardons     10.     US EPA ID Number     8.     Transporter 2 Company Name       9. Despatie Facility Name and Beardons     10.     US EPA ID Number     8.     Transporter 2 Company Name       11. Waste Straft AGB MB/BE/BE/BE/BE/BE/BE/BE/BE/BE/BE/BE/BE/BE		3	3. Generator's Name and Mailing Address		54							
4. Generator's Pipes (175, 24.8)     Samta Fr, New Medice 27605     I. C. Comitry, NM       5. Transporter 1 Company Name     6. USE PAID Number     NA     Transporter 3 Project       7. Transporter 2 Company Name     8. USE PAID Number     NA     Stransporter 3 Project       8. Transporter 2 Company Name     10. USE PAID Number     D. Transporter 3 Project     Stransporter 3 Project       9. Designated Facility Name and Standardss     10. USE PAID Number     D. Transporter 3 Project     Stransporter 3 Project       9. Designated Facility Name and Standardss     10. USE PAID Number     D. Fuellity's Prone       8. Bill South of Hobbs on Iway 18     N/A     Str2 Company       9. Designated Facility Name and Standards     10. USE PAID Number     C. Fuellity's Prone       8. Bill South of Hobbs on Iway 18     N/A     Str2 Company       9. Day D/F     M'N/A/H     SOL'Y     M'N/A       9. Day D/F     M'N/A/H     SOL'Y     M'N/A       9. C     2     1/2     1/2       9. C     2     1/2     1/2     1/2       9. Day D/F     1/2     1/2     1/2     1/2       9. Addi				New Mexico O	il Conserva	tion Divisio	on -	A	raho	Dispo	sal Facility	
5. Transport     Color J 16: 2426     Samin F. Vet WebCO C/200     A. Transport     Transport       5. Transport     Company Num     6.     US EPA ID Number     B. Transport     Finne       7. Transport     Company Num     8.     US EPA ID Number     B. Transport     Finne       9. Designated Facility Neme and Site Address     10.     US EPA ID Number     B. Transport     Finne       9. Designated Facility Neme and Site Address     10.     US EPA ID Number     B. Transport     Finne       11. Waste Stadyfing Infill Mathematics Facility Neme and Site Address     10.     US EPA ID Number     C. Facility Prome       8. Index Stadyfing Infill Mathematics Facility Neme and Site Address     10.     US EPA ID Number     C. Facility Prome       9. Description     11. Waste Stadyfing Infill Mathematics     Sol - 247 - 24646     If Sol - 247 - 24646       11. Waste Stadyfing Infill Mathematics     Sol - 247 - 24646     If Sol - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 - 247 -		4	Generator's Place ( 470 a) an	1220 South St.	Francis Dr	ive .		NE/	4, SE/	4,Sec	1,T17S,R31E	
Rhino Environmental Services, Inc.       N/A       95-307-3044         7. Transporter 2 Company Name       6.       US EPA ID Number       8. Transporter 3 Phone         8. Designated Fieldly Name and Sile Address       10.       US EPA ID Number       8. Transporter 4 Phone         9. Designated Fieldly Name and Sile Address       10.       US EPA ID Number       6. Facility 3 Phone         11. Waste Strepfield Name and Sile Address       10.       US EPA ID Number       6. Facility 3 Phone         11. Waste Strepfield Name and Sile Address       10.       US EPA ID Number       6. C. Facility 3 Phone         11. Waste Strepfield Name and Sile Address       10.       US EPA ID Number       10. Containers         12. Containers       13. Transporter 4 Streptield Name and Sile Address       10. US EPA ID Number       10. Containers         13. Based Strepfield Name Strepfield Name Strepfield Name Strepfield Name Strepfield Name Strepfield Name       10. US EPA ID Number       10. US EPA ID Number         14. Dapp OF       M* Y 44       Sort Y       D M       10. Strepfield Name       10. US EPA ID Number         15. Decol Provide Strepfield Name       10. US EPA ID Number       N/A       US EPA ID Number       10. US EPA ID Number         15. Special Handling Instructions and Additional Information       10. US EPA ID Number       10. US EPA ID Number       N/A <th></th> <td>5</td> <td>5. Transporter 1 Company Name</td> <td>Santa Fe, New</td> <td>6.</td> <td>US EPA ID I</td> <td>Number</td> <td>A. Transpor</td> <td>ea Co ter's Pl</td> <td>none</td> <td>NM</td> <td></td>		5	5. Transporter 1 Company Name	Santa Fe, New	6.	US EPA ID I	Number	A. Transpor	ea Co ter's Pl	none	NM	
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No.       Type       Quantity       WWVer         a       Logo       D.F       M: KU44       SO: Y       My       IS544       IS544 <th></th> <td>1</td> <td>11. Waste Shipping Name and Description</td> <td></td> <td></td> <td></td> <td></td> <td>12.</td> <td>Conta</td> <td>ainers</td> <td>13. Total</td> <td>14.</td>		1	11. Waste Shipping Name and Description					12.	Conta	ainers	13. Total	14.
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	4	. Generator's Phone 505 476-3488	Santa Fe, New Mex	tico 87505			Lea Co	unty, NM	
	5	5. Transporter 1 Company Name	6.	US EPA ID Numbe	ər	A. Transpor	ter's Phone		
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	9	9. Designated Facility Name and Site Address Rhino Environmental Ser	10. rvices, Inc. OCD	US EPA ID Numb	er	C. Facility's	Phone		
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# Attachment F

Attachment F Tank (Steel) Receipt 
 RHINO ENVIRONMENTAL
 915 842 9933
 11/18/03 08:12pm
 P. 002

 NOV-18-2003 TUE 04:50 PM
 STEEL_DEPOT
 5053939393
 P. 02

## Hobbs Iron and Metal, Inc.

505 393-1726 P. O. BOX 2007 HOBBS, NEW MEXICO 88240

Nov 18, 2003

Rhino Environmental 200 Sunset Dr. Suite D El Paso, Tx 79922

Re: Scrap Tkts #36216 & #36230

Dear Sir:

ŕ

We purchased the material that was listed on the above referenced tickets for the sole purpose of recycling. The material was cut in 3' lengths by a shear, loaded on a railcar, and shipped to Chaparcal Steel Mills in Dallas. They then melted the material down to form new steel products. I hope this answers the questions you have.

Succerely, tate Mennick Pati Minnick Bookeeper

RHIND ENVIRONMENTAL

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915 842 9933

11/14/03 02:15pm P. 003

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### 112:42 HOBBS IRON & METAL, INC. 920 5. GRIMEB • P.O. 80X 2007 • 505-393-1726

19.00.01

HOBBS, NEW MEXICO 88241 1

Date: Name: Addrese:	10/24/03 RHIND ENVIROMENTAL	7,	;	Ticket Number: License Number:	36230 Justin	R
Cily;	HOBBS		KD	ORIGINAL	PRINTED	10/64/63

For and in consideration of the sum of ... _____, I hereby bargain, sell, transfer and assign to HOBBS IRDW & MUTAL, INC. the following personal property, to-wit.

ITEM	G	RO <b>63</b>	TARE	NET	
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NOLAN H. BRU P.O. BOX 2390 • HOBBS, N TELEPHONE (505) 393-6169 • TO	JNSON, IN TEW MEXICO 88241- LL FREE 1-800-321-	IC. 2390 8993		
RHINO ENVIRONMENTAL SERVICES, INC P. O. BOX 57180 ALBUQUERQUE NM 87187	2.	N.M.S.C.C. TEX. A.R.C. I.C.C. INVOICE NO. 2 B.L. NO. OATE BULLED OADER NO. ORDERED BY S	1300 22030 MC-276467 310203 0/27/03 TEVE	
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ARAJO REINJECTION FACILITY NM				
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EW/so				



200 Sunset Drive, Suite D, El Paso, Texas Phone (915) 842-9911 • Fax (915) 842-9933 www.rhinoservices.net

#### **CERTIFICATE OF DESTRUCTION BILL OF SALE**

Date: November 17, 2003

Seller of Tanks Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87585

Tank Facility Araho Injection Facility Lovington, NM

Buyer of Tanks Rhino Environmental Services, Inc. P.O. Box 57180 Albuquerque, New Mexico 87187

Tank Identification: (2) - 500 Barrel Steel Tank (1) – 200 Barrel Steel Tank

Rhino Environmental Services, Inc. (Rhino) accepts ownership of the above described tanks. The tanks were transported to the Goo Yea South facility just south of Hobbs, New Mexico. Upon transfer of ownership dated October 22, 2003, Rhino relieves the former owner and accepts all future liabilities connected with the tanks.

I certify that any residual solids will be removed from the above described tanks, and that each tank will be cut into scrap and recycled and/or disposed of in accordance with all applicable local, state, and federal regulations.

Steve Dver

Project Manager

# Attachment G .



2709-D Pan American Freeway NE Albuquerque, New Mexico 87107 Phone (505) 344-3777 Fax (505) 344-4413

Date

4/30'03

Invoice

84904





Bill N.M. Oil Conservation Division To: 1220 South St. Francis Dr. Santa Fe, NM 87505

Client #: 810-134

Project #: Araho Site

Original	
BALANCE DUE:	42.00

•		PO Number	Te	erms	I	Project
			Ne	et 30	PIN	N ALB-810
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	Remit to: Pinnacle Laborator 2709-D Pan America Albuquerque, NM	ries, Inc. an Freeway M 37107	1E			
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_	BARNESS TIMMELLE LINE	bonutories inc.	DATE:		3044(200-20
	PROJECT MANAGER:			A MALYSIS REQUESTS	
	COMPANY: <u>Oil Guserva</u> ADDRESS: <u>AHA. M</u> PHONE: <u>1220 5. 5</u> FAX: <u>0CD</u> BILL TO: <u>OCD</u> COMPANY: ADDRESS: <u>OCD</u>	ation Division lartyne Lieling 51. Francis Drive e. 4E, UU 87505	Petroleum Hydrocarbons (418.1) TRPH         (MOD.8015) Diesel/Direct Inject         (M8015) Gas/Purge & Trap         8021 (BTEX)/8015 (Gasoline) MTBE         8021 (BTEX) □MTBE □ TMB □ PCE         8021 (EDX)         8021 (EDX)	8021 (COST) 504.1 EDB □ / DBCP □ 8260 (Full) Volatile Organics 8260 (CUST) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (CUST) Volatile Organics 8260 (CUST) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) Volatile Organics 8260 (CUST) Volatile Organics 8260 (Landfill) V	Polynuclear Aromatics (610/8310/8270-SIMS) General Chemistry: Target Analyte Liet Metals (13) RCRA Metals (8) RCRA Metals (8) Metals: P <b>J</b>
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1					
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	PROJ. NO ARAHO SITE	(RUSH) 24hr 148hr 72hr <b>2</b>	31 WEEK (NORMAL)	Signature: 1:06	Signature: Time:
	PROJ. NAME:		C SDWA COTHER		Printed Name: Date:
	P.O. NO.:	METHANOL PRESERVATION L		Company:	Compativit
	SHIPPED VIA; SAMPLE RECEIPT	T):	to OCD	See reverse side (Force Majeure)	
	NO CONTAINERS	send copy of resu	elts to:	Signature: Time:	
	CUSTODY SEALS	JOHN BUNCH @ REG 4775 / Walion Sch	SPEC 100/ Pd NE , SUTTE 300	Printed Name: Date:	
<u></u>	BUURIGENES AND AND A COMPANY	ABQ NM G71	0/	Comparty:	a Buurton autoration certure and
	01/01/02 PLI Inc.: Pinnacle Laboratories, Inc. • 2709-1	-D Pan American Freeway, NE • Albuquerque, N	lew Mexico 87107 • (505) 344-3777 • Fax (505) 3	44-4413 • E-mail: PIN_LAB@ATT.NET	DISTRIBUTION: White - PLI, Canary - Originator

**NAMBED AREAS ARE FOR LAB USE ONLY** 

CHERN

PLEASE FILL THIS FORM IN COMPLETELY.



2709-D Pan American Freeway NE Albuquerque, New Mexico 87107 Phone (505) 344-3777 Fax (505) 344-4413

PL I.D. 304120

May 1, 2003

NMOCD 1220 S. St. Francis Drive Santa Fe, NM 87505

RESPEC 4775 Indian School Rd NE Suite 300 Albuquerque, NM 87110

Project Name/Number: ARAHO SITE

Attention: Martyne Kieling/John Bunch

On 04/17/03, Pinnacle Laboratories Inc., (ADHS License No. AZ0643 pending), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

H. Mitchell Rubenstein, Ph.D. General Manager

MR:jt

Enclosure

2709-D Pan American Freeway NE Albuquerque, New Mexico 87107 Phone (505) 344-3777 Fax (505) 344-4413



CLIENT	: NM OIL CONSERVATION DIVISION	DATE RECEIVED	:04/17/03
PROJECT #	: ARAHO SITE		
PROJECT NAME	:(NONE)	REPORT DATE	:05/01/03

#### PL ID: 304120

	PINNACLE ID #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	304120-01	PAINT CHIPS FROM SITE TANKS	AQUEOUS	04/14/03

---TOTALS----

**#SAMPLES** 

<u>MATRIX</u> AQUEOUS

Ms Pi	. Jacinta Tenorio			LOG NO: Received: Reported:	C3-04424 18 APR 03 24 APR 03
27 Al	09-D Pan American Fr buquerque, NM 87107	eeway Northeast		Cl Project	No: 304120
			Project:	304120, NMOCD Sampled Code:	ARAHO SITE By: Client 121530425
		REPORT OF RESULTS	5		Page 1
LOG NO	SAMPLE DESCRIPTION	, SOLID OR SEMISOLID	SAMPLES	DATE/ TIME SAMPLED	
04424-1	304120-01	· · · · · · · · · · · · · · · · · · ·		04-14-03/16:0	5
PARAMETER			04424-	1	
Lead (6010	B), mg/kg		21	.0	
Dilution Prep Date	Factor		04.21.0	2	
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Batch ID			PSOG	5	
Prep Meth Analyst	.00		3050 GS	P ····································	

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				LOG NO Received Reported	: C3-04424 : 18 APR 01 : 24 APR 01
Μ	1s. Jacinta Tenorio				
E	Pinnacle Laboratories				
2	2709-D Pan American Free Albuquerque, NM 87107	way Northeast		CI Project	No: 304120
			Project: 30	04120, NMOCD Sampled Code	ARAHO SITE By: Client : 121530425
		REPORT OF RESULTS		(	Page 2
				DATE/	
LOG NO	SAMPLE DESCRIPTION , (	QC REPORT FOR LIQUID	) SAMPLES .	FIME SAMPLED	
04424-2 04424-3 04424-4 04424-5	Method Blank Lab Control Standard ⁵ Matrix Spike % Recover Matrix Spike Duplicate	% Recovery ry e % Recovery			
PARAMETER	R	04424-2	04424-3	04424-4	04424-5
Lead (601	10B), mg/kg	<0.50	97 %	N/C	N/C
Dilution	n Factor	1			
Prep Dat	te	04.21.03			
Analysis	s Date	04.22.03			
		PS065	PS065	PS065	PS065
Batch II	D	10000			
Batch II Prep Met	D thod	3050B			

regarding this test report should be directed to the STL Project Manager who signed this test report. See the Project Sample Inspection Form (PSIF) to determine if a sample was received that did not meet EPA requirements for sample collection, preservation, or holding time.

TRON Kers chok Lance Larson, Project Manager

Final Page Of Report

STC-8213-400 (12/02)

VERN.


# STL Pensacola Data Qualifiers for Final Report

В	The analyte was detected in the associated method blank and in the client's sample.
С	The compound has been quantitated against a one point calibration.
D	Recovery is not calculable due to dilution.
Е	Estimated value because the analyte concentration exceeds the upper calibration range of the instrument or method.
I	Estimated value because the analyte concentration is less than the lower calibration range of the instrument but is at the method detection limit or greater than the method detection limit.
Н	Sample and/or duplicate is below 5 X (times) the STL Reporting Limit and the absolute difference between the results exceeds the STL Reporting Limit.
J1	A sample surrogate or an LCS target compound recovered above the upper control limit (UCL). Compounds qualified with a J1 may be biased high.
J2	A sample surrogate or an LCS target compound recovered outside the lower control limit (LCL). Compounds qualified with a J2 may be biased low.
M1	A matrix effect was present.
M2	The MS and/or MSD %R or RPD was outside upper or lower control limits; not necessarily due to matrix effect.
N/C	Not Calculable; Sample spiked is > 4X spike concentration (may use this flag in place of negative numbers).
RI	Internal standard area exceeds the acceptance criteria
R2 .	Calibration verification exceeds the acceptance criteria.
S1	The Method of Standard Additions (MSA) has been performed on this sample.
T	Second-column or detector confirmation exceeded the SW-846 criteria of 40% RPD for this compound.
TIC	The compound is not included in the initial calibration curve. It is searched for qualitatively or as a Tentatively Identified Compound.
U or <	The analyte was not detected at or above the MDL or the RL, whichever is entered next to the "U" or "<".
W	Post-digestion spike for Furnace AA is out of control limits (85-115%), while sample absorbance is less than 50% spike absorbance.

It is permissible to submit an Out-of-Control Events/Corrective Action form and/or Case Narrative in lieu of using above qualifiers.

When the laboratory receives a sample that does not meet EPA requirements for sample collection, preservation or holding time, the laboratory is required to reject the samples. The client must be notified and asked whether the lab should proceed with analysis. Data from any samples that do not meet sample acceptance criteria (collection, preservation and holding time), must be flagged, or noted on a corrective action form or case narrative, or addressed on the Project Sample Inspection Form (PSIF) in an unambiguous manner clearly defining the nature and substance of the variation. NPDES samples from North Carolina that do not meet EPA requirements for sample collection, preservation or holding time are non-reportable for NPDES compliance monitoring.

Abbreviations	
ND	Not Detected at or above the STL Pensacola reporting limit (RL)
NS	Not Submitted
NA	Not Applicable
MDL	STL Pensacola Method Detection Limit
RL	STL Pensacola Reporting Limit
NoMS	Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD)

#### Florida Projects Inorganic/Organic

Refer to FL DEP 62-160.700(7); Table 7 Data Qualifier Codes. FL DEP Rule 62-160.670(1)(h) states that laboratories shall include the analytical result for each analysis with applicable data qualifiers. FL DEP Rule 62-160.700(7), Table 7 lists the FL DEP data qualifiers. FL DEP Rule 62-160.700(3), Table 3 lists the Florida sites which require data qualifiers.

#### AFCEE OAPP Projects

Refer to AFCEE QAPP for appropriate data qualifiers (AFCEE QAPP Version will be specified by client for the project).

#### Arizona DEQ Projects

Any qualified data submitted to Arizona DEQ (ADEQ) after January 1, 2001 must be designated using the Arizona Data Qualifiers as developed by the Arizona ELAC technical subcommittee. Refer to the ADEQ qualifier list.

# CLP and CLP-like Projects

Refer to referenced CLP Statement of Work (SOW) for explanation of data qualifiers. CLP SOW to be followed must be specified to client.

STL Pensacola PROJECT SAMPLE INSPECTIO	NFORM
Lab Order #: <u>C304474</u>	Date Received: 4/1863
1. Was there a Chain of Custody? Yes No*	8. Were samples checked for Yes No ⁺ N/A preservative? (Check pH of all H ₂ O requiring preservative (STL-PN SOP 917) except VOA vials that
2. Was Chain of Custody properly ves No* filled out and relinquished?	9. Is there sufficient volume for Yes No ⁴ N/A analysis requested?
3. Were all samples properly (Yes) No* labeled and identified?	10. Were samples received within Yes No ⁺ Holding Time? (REFER TO STL-SOP 1040)
4. Were samples received cold? (Ves) No* N/A (Criteria: 2° - 6°C: STL-SOP 1055)	11. Is Headspace visible > ¼" in Yes* No (N/A) diameter in VOA vials?*
5. Did samples require splitting or Yes* No	12. Were Trip Blanks Received? Yes No N/A
compositing*?	13. If sent, were matrix spike Yes No ⁺ NTA bottles returned?
6. Were samples received in proper containers for analysis	14. If sent, were T-Handles Yes No* N7A returned?
7. Were all sample containers (Yes) No* received intact?	15. If any issues, how was PM PSIF Verbal D
Out of Control Events and Inspection Comments      1-3. COC/Sample ID/COC discrepancy:      They are      Solid      4. Insufficient Ice      Delay in delivery      Other      5. Samples were Split      Composited      Requise      6. Improper Containers (ID/Size/desc):	( <i>list sample IDs/Tests where appropriate):</i> ( <i>list sample IDs/Tests where appropriate):</i> ( <i>e. C. Shows the Matrix of HQ but</i> Chaps Dested by: Client PM D Other:
7. Broken bottles/Test	
8. Incorrect pH:	
9. Test/Matrix/Volume: 10. Out of Holding Time/Test	
11. VOA headspace >1/4" (list size) List additional comments by above number:	
	(USE BACK OFPSIFOR ADDITIONAL NOTES AND COMMENTS )
Depended By	Lagrad Bri 22 Data: 14/18-11-3
A contract of the formation of the forma	LUYYCU Dy Date Date
	an the pH log provided (STL-SOF 934).

# STL PENSACOLA Certifications, Memberships & Affiliations

Alabama Department of Environmental Management, Laboratory ID No. 40150 (Drinking Water by Reciprocity with FL), expires 06/30/03 Arizona Department of Health Services, Lab ID No. AZ0589 (Hazardous Waste & Wastewater), expires 01/11/04 Arkansas Department of Pollution Control and Ecology, (No Laboratory ID No. assigned by state) (Environmental), expires 02/20/03 California Department of Health Services, ELAP Laboratory ID No. I-2510 (Hazardous Waste and Wastewater), expires 03/31/03 Connecticut Department of Health Services, Connecticut Lab Approval No. PH-0697 (D W, H W and Wastewater), expires 09/30/03 Florida DOH, NELAP Laboratory ID No. E81010 (Drinking Water, Hazardous Waste and Wastewater), expires 06/30/03 Florida DEP/DOH CompQAP # 980156 Iowa Department of Natural Resources, Laboratory ID No. 367 (UST), expires 08/01/04 Kansas Department of Health & Environment, NELAP Laboratory ID No. E10253 (Wastewater and Hazardous Waste), expires 10/31/03 Kentucky NR&EPC, Laboratory ID No. 90043 (Drinking Water), expires 12/31/03. Louisiana DEQ, LELAP, NELAP Laboratory ID No. 02075, Agency Interest ID 30748 (Environmental, expires 6/30/03) Maryland DH&MH Laboratory ID No. 233 (Drinking Water by Reciprocity with Florida), expires 09/30/03 Massachusetts DEP, Laboratory ID No. M-FL094 (Wastewater), expires 06/30/03 Michigan Bureau of E&OccH, Laboratory ID No.9912 (Drinking Water by Reciprocity with Florida), expires 06/30/03 New Hampshire DES ELAP, NELAP Laboratory ID No. 250502 (Drinking Water & Wastewater), expires 08/16/03 New Jersey DEP&E, NELAP Laboratory ID No. FL006 (Wastewater and Hazardous Waster), expires 06/30/03. New York State Department of Health, NELAP Laboratory ID No. 11503 (WW and Solids/Hazardous Waste), expires 06/16/2003 North Carolina DENR, Laboratory ID No. 314 (Hazardous Waste and Wastewater), expires 12/31/03. North Dakota DH&Consol Labs, Laboratory ID No. R-108 Wastewater and Hazardous Waste by Reciprocity with Florida), expires 06/30/03 Oklahoma Department of Environmental Quality, Laboratory ID No. 9810 (Hazardous Waste and Wastewater), expires 08/31/03 Pennsylvania Department of Environmental Resources, NELAP Laboratory ID No. 68-467 (Drinking Water & Wastewater), expires 12/01/03 South Carolina DH&EC, Laboratory ID No. 96026 (Wastewater & Solids/Hazardous Waste by Reciprocity with FL), expires 06/30/03 Tennessee Department of Health & Environment, Laboratory ID No. 02907 (Drinking Water), expires 08/03/04 Virginia Department of General Services, Laboratory ID No. 00008 (Drinking Water by Reciprocity with FL), expires 06/30/03. Washington Department of Ecology, Laboratory ID No. C282 (Hazardous Waste and Wastewater), expires 09/14/03. West Virginia DOE, Office of Water Resources, Laboratory ID No. 136 (Haz Waste and Wastewater), expires 04/30/02. AIHA (American Industrial Hygiene Association) Accredited Laboratory, Laboratory ID No. 100704, expires April 1, 2004. Participant in AIHA sponsored Laboratory PAT Rounds EPA ICR (Information Collection Rule) Approved Laboratory, Laboratory ID No. ICRFL031 NFESC (Naval Facilities Engineering Services Center), expires April 18, 2004/ USACE (United States Army Corps. of Engineers), MRD, expires June 30, 2003. STL Pensacola also has a foreign soil permit to accept soils from locations other than the continental United States. Permit No. 5-37599 ertlist\condcert.lst_revised_2/25/03 Total Pages of Report

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RoleCT INFORMATION    SAMPLE RECEIPT    SAMPLES SENT TO:    RELINQUISED BY:    1.    RELINQUISED BY:    2.      ECT #:    304/20    Total Number of Containers    PENSACOLA - STL-FL    Signature:    1.    RELINQUISED BY:    2.      NAME:    MMOCD    Total Number of Containers    PENSACOLA - STL-FL    Signature:    1.    Imme      NAME:    MMOCD    Chain of Custody Seals    ESL · OR    MMULUL/MMUL    Signature:    Time:      VEL:    SID    N    Received Intact?    ATEL - AZ    Printed Name:    Date:    Date:      VEL:    SID    N    Received Intact?    ATEL - AZ    Printed Name:    Date:    Date: <td></td>																									
ECT #:    304/20    Total Number of Containers    PENSACOLA - STL-FL    X statement    Time:    Time: <th< td=""><td>ROJECT INFORMATION</td><td></td><td></td><td>SAMPLE RI</td><td>ECEIPT</td><td></td><td>ls/</td><td>MPLE</td><td>S SEI</td><td>11 TO</td><td></td><td>REI</td><td>INQU</td><td>ISED</td><td>BΥ:</td><td></td><td></td><td>1.</td><td>REL</td><td>NQUIS</td><td>ED E</td><td>: ۲:</td><td></td><td></td><td>~</td></th<>	ROJECT INFORMATION			SAMPLE RI	ECEIPT		ls/	MPLE	S SEI	11 TO		REI	INQU	ISED	BΥ:			1.	REL	NQUIS	ED E	: ۲:			~
NAME:  MAOCD  Chain of Custody Seals  ESL - OR  MUMUMUL/MMIN / HOU    VEL:  STD  N  Received Intact?  ATEL - AZ  Prined Name:  Date:    VEL:  STD  N  Received Intact?  ATEL - AZ  Prined Name:  Date:    COURED:  MS  MSD  BLANK  Received Good Cond./Cold  ATEL - AZ  Prined Name:  Date:    STANDARD  CUSHIL  LAB NUMBER:  ATEL - MELMORE  Prinacle Laboratories, Inc.  Company    STANDARD  CUSHIL  LAB NUMBER:  ATEL - MELMORE  Prinacle Laboratories, Inc.  Interd Name:  Date:    ATE:  4D4 or 4125  Comments:  I.  RECEIVED BY:  I.  RECEIVED BY:  Z.    ATE:  4D4 or 4125  Comments:  I.  RECEIVED BY:  I.  RECEIVED BY:  Z.    ATE:  4D4 or 4125  Comments:  I.  RECEIVED BY:  I.  RECEIVED BY:  Z.    Intro Charles:  25'/s  Signatures:  I.  RECEIVED BY:  I.  RECEIVED BY:  Z.    InterConstruct  5  0.0FMIL  NOHL  Printed Name:  Date:  Pate:  Date:	=ct #: 304/20		Total Nur	nber of Cor	itainers		ä	NSAC	OLA -	STL-I	L L		;ejn	1		ر Time	]		Signati	:eJr			Time:		
Vector  Strepting  Name:  Date:	NAME: NMOCD		Chain of	Custody Se	als		Ĕ	r - 0	~			K	ame	MC.	Z	WN )	Ĕ	20							
EQUIRED: MS  MSD  BLANK  Received Good Cond/Cold  ATEL - MARION  1 NULLUL INT INT INS    STANDARD  FUSHIL  LAB NUMBER:  ATEL - MELMORE  Pinnacle Laboratories, Inc.  Company    STANDARD  FUL  ATEL - MELMORE  Pinnacle Laboratories, Inc.  Company    STATE:  424 or 4/25  comments:  L  RECEIVED BY:  1.  RECEIVED BY:  2.    SUBCHARGE:  25 Zo  Signature  GEL  Signature  Printed Name:  Date:  Printed Name:  Date:    ISURCHARGE:  25 Zo  VOHL  Printed Name:  Date:  Pate:  Printed Name:  Date:	evel: (STD) IV		Received	Intact?			Ā	EL - /	N			<u>E</u>	d Name			Date			Printed	Name:			Date:		
STANDARD  Curshill  LAB NUMBER:  ATEL - MELMORE  Pinnacle Laboratories, Inc.  Company    OATE:  4/25  common  1.  RECEIVED BY:  1.  RECEIVED BY:  2.    OATE:  4/25  common  6EL  Signatured  1.  RECEIVED BY:  2.    ISURCHARGE:  25 %  10.  MML  NML  95.0  Signatured  Time:  2.    ISURCHARGE:  25 %  10.  NML  NML  95.0  Signatured  Time:  2.    ISURCHARGE:  25 %  10.  NML  NML  NME  10.  10.  10.    Isult CERTIFICATION  NOHL  0.  0.  0.  0.  0.  0.  10.	EQUIRED MS MSD	BLANK	Received	Good Con	d./Cold	1	Ā	EL - N	<b>IARIO</b>	z		1	WUCH	Ž	M	e)		R					Ī		
DATE:  H2d or H2S  I. RECEIVED BY:  I. RECEIVED BY:  2.    DATE:  H2d or H2S  comments:  GEL  signature// LCueffer/ GSC  signature:  Time:  2.    ISURCHARGE:  25%  Printed Name:  Dot  Dot  MiAMI  Printed Name:  Dot    INDISCOUNT:	STANDARD (RUSHIL)		LAB NUN	ABER:			<u>-</u>	EL - N	<b>IELMC</b>	DRE		Pinn	acle La	aborat	ories,	лс.	-		Compa	λυ					
DATE: 424 or 4/25 comments: Time: GeL Signature Time: Signature: Time: Signature: Time: Date: 4/24 or 4/25 comments: Time: Time: Discount:							<u>لت</u>	_				Щ Ш		D BY				÷	REC		ВҲ				~i
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coassion # 11 20 LL 20 LL II	QUESTS WORK MANNAVIA	Acticides/PCB (608/8081/8082) Herbicides/PCB (608/8081/8082) Herbicides/PCB (608/8081/8082) Base/Neural/Acid Compounds GC/MS (625/8270) Bolynuclear Aromatics (610/8310/8270-5IMS) General Chemistry: Target Analyte List Metals (13) RCRA Metals by TCLP (Method 1311) RCRA Metals by TCLP (Method 1311) RCRA Metals by TCLP (Method 1311) RCRA Metals by TCLP (Method 1311) Metals: <b>Pb</b> Metals: <b>Pb</b>							1 RELINQUISHED BY:	le: /: 06 Signature: Time:	e: Printed Name: Date:	4:17.3	Conjectiv:	MALL MECEIVED BY (LAB) 2.	EVEL MINUS AND 1907	Received Source 41 12/03	Primacie Laborniories Inc	T.NET DISTRIBUTION: White - PLI, Canary - Originator
	<b>ANALYSIS RE</b>	504.1 EDB							RELINQUISHED BY:	Signature.	Printed Name: Date	John R Bunch	Company: See reverse side (Force Majeu	A RECEIVED BY A V	Signature: Time	Printed Name: Date	Company:	4-4413 • E-mail: PIN_LAB@AT
CHAIN OF CUST		Petroleum Hydrocarbons (418.1) TRPH (MOD.8015) Diesel/Direct Inject (M8015) Gas/Purge & Trap 8021 (BTEX)/8015 (Gasoline) MTBE 8021 (BTEX)/8015 (Gasoline) MTBE 8021 (TCL) 8021 (EDX) 8021 (EDX) 8021 (LDX)							EQUIRED FOR RUSH PROJECTS	🔀 1 WEEK (NORMAL)	C SDWA COTHER			to OCD	alts b:	NOO/ P& NE , SUTTE 300	0//	New Mexico 87107 • (505) 344-3777 • Fax (505) 34
boratories Inc.		Aurtyne Lieling St. Francis Drive E. V.E. /// 87505	1/43 4.05 1443 0						PRIOR AUTHORIZATION IS R	(RUSH)		METHANOL PRESERVATION	COMMENTS: FIXED FEE	Direct Bill	Send copy of resi	4775 / Walian Sel	HBQ NW 61	09-D Pan American Freeway, NE • Albuquerque, I
MARIA Dinnacle La	PROJECT MANAGER:	COMPANY: <u>Oil Gusen</u> ADDRESS; <u>Attan 1</u> ADDRESS; <u>Attan 1</u> PHONE: <u>5aut</u> FAX: FAX: BILL TO: <u>OCP</u> COMPANY: <u>OCP</u> ADDRESS: ADDRESS:	Paint CHIPS FROM STE 4	TANKS					PROJECT INFORMATION	PHOL NO.: ARAHO SITE	PROJ. NAME:	P.O. NO.:	SHIPPĘD VIA;	E VAR SAMPLEREDELT	LE NOTODITATIVERS & AND			01/01/02 PLI Inc.: Pinnacle Laboratories, Inc. • 270

# Attachment H

Attachment H Miscellaneous Debris Waste Tickets

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	P.O. Box 388	LLED RECOVER Hobbs, New Mexico 88 (505) 393-1079	<b>Y, INC.</b> 241-0388	WASTE "AT C Misc	TIL TR
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Company/Generator	-	CD			
sasa Name	the abie	<u>s (01)</u>		1	
Tucking Company	Chart Vehi	icle Number 503	Driver (Print) / /	SC JANNINGS	~
Date //	6 03	Time	// 30	a.m/p.r	n
		Type of Material			
tqmed E	🗆 Tank Bot	toma	C Fluids		
Non-Exempt	C117		Other Material		
C138	Q Soils	$\alpha \cdot \alpha$	List Description	Belaw	
		OC 1			
A		DESCRIPTION	//		
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	Pipe	t Tank leve	n Quai		
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			<i>{ { } <i>} </i></i>	<u></u>	
Volume of Material D Bb	ls			Gallons	
U Wash Out D Ca	ill Out	After Hou	173	Debris Charge	
This statement applicable to e: I represent and warrant that the	xempt waste only. wastes are: generated fr	om oil and gas exploration (	and production operations	s: exempt from Resource	•
Conservation and Recover Act (	RCRA) Subtitle C Regula	tions; and not mixed with n	on-exampt wastes.		
Acont	<b>.</b>	Acht			
(Bignéture)		18/1		· · · · · · · · · · · · · · · · · · ·	
CRI Representative		U. fr			<u> </u>
(Signet	ura)				
TANK BOTTOMS		· .			
Feel	Inches		······		
1st Gauge		BBLS Re	ceived	BS&W	%
200 00000		Free	Water		
King ganda					
		-			
Received		Total Re	Ceived	<u> </u>	

11/06/03 07:03pm P. 003 RHING ENVIRONMENTAL 915 842 9933 WASTE TICKET TRASH MISE THASH DSDDE CAMINO REAL ENVIRONMENTAL CENTERF 1000 Camino Real Boulevard Sunland Park, NM 88063 (505) 589-9440 Bill Acct: ERHIND ENVIRONME Haul Acct: RHIND ENVIRONM Ticket#:E523829F E00-0000628F 00-0000628 Vehicle# : 003 P0# ----In---- ----Out---TT = 200-Commercial Date 10/28/03 10/28/03 PT = 1-Charge Check # : Time 14:28 14:28 14 -1E Material Types Rate/UM Vol/QY lbs Tax Tip Tot -ØF MT = 30-Commercial5 0 \$0.00 Ε TipsAat Ū, ESpectant EChange F 0.00F VOL/QY/CYD = 5.00 ε =====F EAmount Driver: Weighmaster: _____-1FRANCISCO CELI PPE PNEW HRS. MON. - FRI. 7AM-4PM 1-CELL 7 TILLET VASTE. P2PPE CAMINO REAL ENVIRONMENTAL CENTERF 1000 Camino Real Boulevard Sunland Park, NM 88063 (505) 589-9440 8111 Acct: ERHINO ENVIRONME Haul Acct: RHINO ENVIRONM Ticket#:E526035F E00-0000628F 88-0000628 ----- In----- Out----· P0# Vehicle# : Date 11/06/03 11/06/03 IT = 200-Commercial Check # : PT = 1 - ChargeTime 14:33 14:33 Vol/QY lbs Tax Tip -1E Rate/UM Material Types Tot -ØF 14 0 \$8.00 MT = 30-Commercial F E Tip Amt ESpec Amt 0.00 EAmt Tend 0.00F EChange VOLZQYZCYD = E 14.00 . .... EAmount ---() Weighmaster: ______-1FRANCISCO_CELIS Driver: PPE PNEW HRS. MON. - FRI. 7AM-4PM CHOCELL 7

RHINO ENVIRONMENTAL 915 842 9933 11/06/03 07:03pm P. 004 WATE TILLET Ar Cost P2PPE CAMINO REAL ENVIRONMENTAL CENTERF MISC. TRASH 1000 Camino Real Boulevard Sunland Park, Nr. 88063 (505) 589-9440 Bill Acct: ERHINO ENVIRONME Haul Acct: RHIND ENVIRONM Ticket#:E525882F 

 E111 Actor Example Environmental
 E00-0000628F
 00-0000628

 Vehicle#: 502-R
 PO#
 ---In----Out- 

 TT = 200-Commercial
 Date 11/06/03
 11/06/03

 PT = 1-Charge
 Check # :
 Time 09:29
 09:29

Rate/UM Vol/QY 1bs Tax Tip -1E Material Types 14 Tot -0F \$5.00/CY 15 0 \$0.00 MT = 30-CommercialE F ម្រ Tip Amt ESpec Amt 0.00 EAmt Tend F EChange E EAmount 0.00F EChange - F. _____ VOL/QY/CYD = 15.00 Weighmaster: _____-1MARIANO VALLE Driver: 🖌 DPE. ONEW HRS. MON. - FRI. 7AM-4PM 1-CELL 7

ATTACHMENTI . . . .

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Attachment I Laboratory Analytical Results

310136

Pinnacle Lab ID number November 17, 2003

ovember 17, 2003

INTERA 6501 AMERICAS PRKWY NE STE.820 ALBUQUERQUE, NM 87110

NMOCD 1220 South St. Francis Drive Santa Fe, NM 87505

Project Name ARAHO Project Number ARAHO

PINNACLE LABORATORIES

Attention: JOE TRACY/MARTYNE KIELING

On 10/24/03 Pinnacle Laboratories Inc., (ADHS Lincense No. AZ0643), received a request to analyze **non-aq** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 8015/8021 analyses were performed by Pinnacle Laboratories, Inc. Albuquerque, NM.

All remaining analyses were performed by Severn Trent Laboratories, Inc. Pensacola, FL.

If you have any questions or comments, please do not hesitate to contact us at (505) 344-3777.

H. Mitchell Rubenstein, Ph.D. General Manager, Pinnacle Laboratories, Inc.

MR: jt

Enclosure



CLIENT	: INTERA	PINNACLE ID	: 310136
PROJECT #	: ARAHO	DATE RECEIVED	: 10/24/03
ROJECT NAME	: ARAHO	REPORT DATE	: 11/17/03
NNACLE			DATE
ID #	CLIENT DESCRIPTION	MATRIX	COLLECTED
0136 - 01	T6-3B	NON-AQ	10/23/03
0136 - 02	T3-2	NON-AQ	10/23/03
<u>31</u> 0136 - 03	Т3-4	NON-AQ	10/23/03
310136 - 04	T1W-1	NON-AQ	10/23/03
0136 - 05	T1E-1	NON-AQ	10/23/03
<b>5</b> 0136 - 06	RS1-3	NON-AQ	10/23/03
310136 - 07	RS2-2	NON-AQ	10/23/03
0136 - 08	T2-3	NON-AQ	10/23/03
0136 - 09	T1/3-3	NON-AQ	10/23/03
<u>31</u> 0136 - 10	T4-2B	NON-AQ	10/23/03
<u>31</u> 0136 - 11	RS3-3	NON-AQ	10/23/03
0136 - 12	T4-2	NON-AQ	10/23/03
<b>51</b> 0136 - 13	T5-2	NON-AQ	10/23/03
310136 - 14	T6-3	NON-AQ	10/23/03
<b>10</b> 0136 - 15	S6-2	NON-AQ	10/23/03
3 0136 - 16	RS4-3.5	NON-AQ	10/23/03
310136 - 17	RS5-1	NON-AQ	10/23/03
310136 - 18	DL1-2	NON-AQ	10/23/03
0136 - 19	S9-2	NON-AQ	10/23/03
370136 - 20	S15	NON-AQ	10/23/03
310136 - 21	S1-1N	NON-AQ	10/23/03
<b>1</b> 0136 - 22	S85	NON-AQ	10/23/03
30136 - 23	DL1-2B	NON-AQ	10/23/03
310136 - 24	C-1	NON-AQ	10/24/03
310136 - 25	C-3	NON-AQ	10/24/03
3 D136 - 26	C-5	NON-AQ	10/24/03
310136 - 27	C-7	NON-AQ	10/24/03
3 <u>1</u> 0136 - 28	C-8	NON-AQ	10/24/03
3 D136 - 29	C-6	NON-AQ	10/24/03
<b>3</b> 0136 - 30	C-4	NON-AQ	10/24/03
310136 - 31	C-2	NON-AQ	10/24/03
340136 - 32	C-9	NON-AQ	10/24/03
3 0136 - 33	C-10	NON-AQ	10/24/03
3T0136 - 34	C-11	NON-AQ	10/24/03
310136 - 35	C-13	NON-AQ	10/24/03

Confidential



# GAS CHROMATOGRAPHY RESULTS

TEST : E	EPA 8021B MOD	IFIED - MET	HANOL PRE	SERVATION		
ELIENT : I	NTERA			Pli	NNACLE I.D.	: 310136
ROJECT # : A	ARAHO				ANALYST	: BP
PROJECT NAME : A	ARAHO					
AMPLE			DATE	DATE	DATE	DIL.
. # CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
01 T6-3B		NON-AQ	10/23/03	NA	10/27/03	1
Ê2 T3-2		NON-AQ	10/23/03	NA	10/29/03	5
в <u> </u>		NON-AQ	10/23/03	NA .	10/27/03	1
PARAMETER	DET. LIMIT	UNI	TS	T6-3B	T3-2	T3-4
ENZENE	0.025	MG/	KG	< 0.025	0.15	< 0.025
OLUENE	0.025	MG/	KG	< 0.025	0.24	< 0.025
ETHYLBENZENE	0.025	MG/	KG	< 0.025	0.78	< 0.025
OTAL XYLENES	0.050	MG/	KG	< 0.050	0.73	< 0.050
SURROGATE:						
ROMOFLUOROBENZENE (%	6) (80 - 120)			102	111	112
DRY WEIGHT (%)				79 _.	88	81

HEMIST NOTES:

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## GAS CHROMATOGRAPHY RESULTS

TEST	: E	PA 8021B MOD	IFIED - MET	HANOL PRE	SERVATION		
LIENT	: IN	NTERA			P	INNACLE I.D.	: 310136
ROJECT #	: A	RAHO				ANALYST	: BP
PROJECT NAM	AE : A	RAHO					
AMPLE				DATE	DATE	DATE	DIL.
D. # CI	LIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
04 T ²	1W-1		NON-AQ	10/23/03	NA	10/27/03	1
65 T	1E-1		NON-AQ	10/23/03	NA	10/27/03	1
6 R	S1-3		NON-AQ	10/23/03	NA	10/29/03	2
PARAMETER		DET. LIMIT	UN	ITS	T1W-1	T1E-1	RS1-3
ENZENE		0.025	MG	′KG	< 0.025	< 0.025	< 0.050
OLUENE		0.025	MG	/KG	< 0.025	< 0.025	< 0.050
ETHYLBENZE	NE	0.025	MG	′KG	< 0.025	0.030	< 0.050
OTAL XYLEN	ES	0.050	MG	/KG	< 0.050	< 0.050	< 0.10
SURROGATE:				:			
DROMOFLUOF URROGATE	ROBENZENE (%)	) (80 - 120)			116	111	106
DRY WEIGHT	(%)	(00 120)			85	81	92

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# GAS CHROMATOGRAPHY RESULTS

TEST	:	EPA 8021B MOD	IFIED - MET	HANOL PRE	SERVATION	-	
CLIENT	:	INTERA			Pl	NNACLE I.D.	: 310136
ROJECT #	ŧ :	ARAHO				ANALYST	: BP
PROJECT	NAME :	ARAHO					
SAMPLE				DATE	DATE	DATE	DIL.
D. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
07	RS2-2		NON-AQ	10/23/03	NA	10/27/03	1
08	T2-3		NON-AQ	10/23/03	NA	10/29/03	5
9	T1/3-3		NON-AQ	10/23/03	NA	10/27/03	1
PARAMETE	R	DET. LIMIT	UNI	ITS	RS2-2	T2-3	T1/3-3
BENZENE		0.025	MG	KG	< 0.025	0.43	< 0.025
OLUENE		0.025	MG/	KG	< 0.025	0.17	< 0.025
ETHYLBEN	IZENE	0.025	MG	/KG	< 0.025	3.6	< 0.025
TOTAL XYI	LENES	0.050	MG	KG	< 0.050	8.6	< 0.050
SURROGA ⁻	TE:						
	JOROBENZENE (	%) ( 80 - 120 )			104	105	99
DRY WEIGI	HT (%)	(00-120)			88	85	84
-							

CHEMIST NOTES:

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# GAS CHROMATOGRAPHY RESULTS

TEST		: EPA 8021B MOD	DIFIED - MET	FHANOL PRE	ESERVATION		
		: INTERA			P	INNACLE I.D.	: 310136
ROJECT #	ŧ	: ARAHO				ANALYST	: BP
PROJECT	JAME	: ARAHO					
SAMPLE	·····			DATE	DATE	DATE	DIL.
þ. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
10	T4-2B		NON-AQ	10/23/03	NA	10/29/03	2
11	RS3-3		NON-AQ	10/23/03	NA	10/28/03	1
2	T4-2		NON-AQ	10/23/03	NA	10/29/03	2
PARAMETE	R	DET. LIMIT	UN	ITS	T4-2B	RS3-3	T4-2
PENZENE		0.025	MG	/KG	< 0.050	< 0.025	< 0.050
DLUENE		0.025	MG	/KG	< 0.050	< 0.025	< 0.050
ETHYLBEN	ZENE	0.025	MG	i/KG	< 0.050	< 0.025	< 0.050
TOTAL XYL	ENES	0.050	MG	i/KG	< 0.10	< 0.050	< 0.10
SURROGA	re:						
BROMOFLU	JOROBENZENE	(%)			115	98	111
DRY WEIGI	HT (%)	(00-120)			80	87	80
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CHEMIST NOTES:

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# GAS CHROMATOGRAPHY RESULTS

TEST	: EPA 8021B MO	DIFIED - MET	FHANOL PRE	ESERVATION		
	: INTERA				PINNACLE I.D.	: 310136
F OJECT #	: ARAHO				ANALYST	: BP
PROJECT NAME	: ARAHO					
SAMPLE			DATE	DATE	DATE	DIL.
II # CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
1 <mark>3</mark> T5-2		NON-AQ	10/23/03	NA	10/28/03	2
1 <b>4</b> T6-3		NON-AQ	10/23/03	NA	10/29/03	2
1 S6-2		NON-AQ	10/23/03	NA	10/29/03	11
PARAMETER	DET. LIMIT	UN	ITS	T5-2	T6-3	S6-2
BENZENE	0.025	MG	/KG	< 0.050	< 0.050	< 0.025
TUENE	0.025	MG	/KG	< 0.050	< 0.050	< 0.025
ETHYLBENZENE	0.025	MG	/KG	0.074	< 0.050	0.046
TOTAL XYLENES	0.050	MG	/KG	< 0.10	< 0.10	0.12
SURROGATE:						
BEOMOFLUOROBENZENE SERROGATE LIMITS	. (%) (80 - 120)			113	115	117
DRY WEIGHT (%)	. ,			81	80	87

CHEMIST NOTES:

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# GAS CHROMATOGRAPHY RESULTS

LOT								
	•			HANOL FRE	ESERVATION -			
	:	INTERA			F	PINNACLE I.D.	: 310136	
ROJECT #	:	ARAHO				ANALYST	: BP	
PROJECT N	IAME :	ARAHO						
SAMPLE				DATE	DATE	DATE	DIL.	
<b>)</b> . #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR	
16	RS4-3.5	······································	NON-AQ	10/23/03	NA	10/28/03	1	
17	RS5-1		NON-AQ	10/23/03	NA	10/28/03	1	
3	DL1-2		NON-AQ	10/23/03	NA .	10/28/03	5	
PARAMETE	R	DET. LIMIT	UNI	ITS	RS4-3.5	RS5-1	DL1-2	
BENZENE		0.025	MG	′KG	< 0.025	< 0.025	< 0.13	
DLUENE		0.025	MG	/KG	< 0.025	< 0.025	< 0.13	
ETHYLBEN.	ZENE	0.025	MG/	/KG	< 0.025	< 0.025	0.61	
TOTAL XYL	ENES	0.050	MG/	′KG	< 0.050	< 0.050	1.8	
	ſĘ.							
BROMOFLU	JOROBENZENE (	(%)			105	108	111	
URROGAT	TE LIMITS HT (%)	(80 - 120)			90	92	81	

**⊆**HEMIST NOTES:

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# GAS CHROMATOGRAPHY RESULTS

TEST	IFIED - MET	HANOL PRE	SERVATION			
LIENT :	: INTERA			F	INNACLE I.D.	: 310136
ROJECT #	: ARAHO				ANALYST	: BP
PROJECT NAME	: ARAHO					
AMPLE			DATE	DATE	DATE	DIL.
. # CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
19 S9-2		NON-AQ	10/23/03	NA	10/28/03	1
20 S15		NON-AQ	10/23/03	NA	10/28/03	1
S1-1N		NON-AQ	10/23/03	NA .	10/28/03	1
PARAMETER	DET. LIMIT	UN	ITS	S9-2	S15	S1-1N
RENZENE	0.025	MG	/KG	< 0.025	< 0.025	< 0.025
DLUENE	0.025	MG	/KG	< 0.025	< 0.025	< 0.025
ETHYLBENZENE	0.025	MG	/KG	< 0.025	< 0.025	< 0.025
TOTAL XYLENES	0.050	MG	/KG	< 0.050	< 0.050	< 0.050
SURROGATE:						
RROMOFLUOROBENZENE	(%) (80 - 120)			105	106	105
DRY WEIGHT (%)	``````````````````````````````````````			84	94	88

CHEMIST NOTES:

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# GAS CHROMATOGRAPHY RESULTS

TEST	: EPA 8021B MODIFIED - METHANOL PRESERVATION							
ELIENT	: INTERA PINNACLE I.D. : 310136							
ROJECT #	: ARAHO				ANALYST	: BP		
PROJECT NAME	: ARAHO							
AMPLE			DATE	DATE	DATE	DIL.		
). # CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR		
22 S85		NON-AQ	10/23/03	NA	10/28/03	1		
<u>₽</u> DL1-2B	······	NON-AQ	10/23/03	NA	10/29/03	5		
ARAMETER	DET. LIMIT	UN	ITS	S85	DL1-2B			
BENZENE	0.025	MG	/KG	< 0.025	< 0.13			
TOLUENE	0.025	MG	/KG	< 0.025	< 0.13			
THYLBENZENE	0.025	MG	/KG	< 0.025	1.9			
TOTAL XYLENES	0.050	MG	/KG	< 0.050	5.8			
URROGATE: BROMOFLUOROBENZENE OURROGATE LIMITS RY WEIGHT (%)	(%) (80 - 120)			98 88	118 83			

CHEMIST NOTES:

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#### GAS CHROMATOGRAPHY RESULTS REAGENT BLANK

TEST LANK I. D. OLIENT PROJECT # ROJECT NAME	: EPA 8021B MODIFIED : 102703 : INTERA : ARAHO : ARAHO	PINNACLE I.D. DATE EXTRACTED DATE ANALYZED SAMPLE MATRIX ANALYST	:	310136 N/A 10/27/03 FP BP
ARAMETER	UNITS			
BENZENE	MG/KG	<0.025		
DLUENE	MG/KG	<0.025		
HYLBENZENE	MG/KG	<0.025		
	MG/KG	<0.050		
JRROGATE:				
BROMOFLUOROBENZENE (%) SURROGATE LIMITS: HEMIST NOTES: N/A		99		



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#### GAS CHROMATOGRAPHY RESULTS REAGENT BLANK

TEST MANK I. D. CLIENT PROJECT # ,	: EPA 8021B MODIFIED : 102803A : INTERA : ARAHO	PINNACLE I.D. DATE EXTRACTED DATE ANALYZED SAMPLE MATRIX	: 310136 : N/A : 10/28/03 : FP
F RAMETER	UNITS	ANALISI	
BENZENE	MG/KG	<0.025	······································
	MG/KG	<0.025	
HYLBENZENE	MG/KG	<0.025	
TOTAL XYLENES	MG/KG	<0.050	
RROGATE:			
BROMOFLUOROBENZENE (%)		96	
SURROGATE LIMITS: CHEMIST NOTES: N/A			



#### GAS CHROMATOGRAPHY RESULTS REAGENT BLANK

TEST LANK I. D. OLIENT PROJECT # ROJECT NAME	: EPA 8021B MODIFIED : 102803B : INTERA : ARAHO : ARAHO	PINNACLE I.D. : DATE EXTRACTED : DATE ANALYZED : SAMPLE MATRIX : ANALYST :	310136 N/A 10/29/03 FP BP
RAMETER	UNITS		
BENZENE	MG/KG	<0.025	
DLUENE	MG/KG	<0.025	
THYLBENZENE	MG/KG	<0.025	
TOTAL XÝLENES	MG/KG	<0.050	
JRROGATE:			
BROMOFLUOROBENZENE (%) PURROGATE LIMITS: HEMIST NOTES: N/A		97	



TEST MANK I. D. LIENT PROJECT # PROJECT NAME	: EPA 8021B MODIFIED : 102903 : INTERA : ARAHO : ARAHO : ARAHO	PINNACLE I.D. DATE EXTRACTED DATE ANALYZED SAMPLE MATRIX ANALYST	: : : : :	310136 N/A 10/29/03 FP BP
RAMETER	UNITS			
BENZENE	MG/KG	<0.025		
TOLUENE	MG/KG	<0.025		
HYLBENZENE	MG/KG	<0.025		
TOTAL XYLENES	MG/KG	<0.050		
SURROGATE: BROMOFLUOROBENZENE (%) SURROGATE LIMITS:		103		

AIST NOTES:

PINNACLE LABORATORIES



# GAS CHROMATOGRAPHY QUALITY CONTROL LCS/LCSD

TEST	: EPA 8021B M : 102703 : INTERA	)21B MODIFIED } A		PINNACLE I.D. DATE EXTRACTED DATE ANALYZED		: : :	310136 N/A 10/27/03		
PROJECT#	: ARAHO				SAMPLE MA	ATRIX	:	FP ·	
ROJECT NAME	: ARAHO				UNITS		:	MG/KG	
	SAMPLE	CONC	SPIKED	%	DUP	DUP		REC	RPD
PARAMETER	RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD	LIMITS	LIMITS
BENZENE	<0.025	1.00	1.05	105	1.04	104	1	(80 - 120)	20
DLUENE	<0.025	1.00	1.03	103	1.03	103	0	(80 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.06	106	1.05	105	1	(80-120)	20
TOTAL XYLENES	<0.050	3.00	3.17	106	3.14	105	1	( 80 - 120 )	20

HEMIST NOTES:

N/A

Spike Concentration

(Sample Result - Duplicate Result)

D (Relative Percent Difference) =

Average Result



#### GAS CHROMATOGRAPHY QUALITY CONTROL LCS/LCSD

TEST ETCH # CENT PROJECT #	: EPA 8021B M : 102803A : INTERA : ARAHO	10DIFIED			PINNACLE I DATE EXTR DATE ANAL SAMPLE MA	.D. ACTED YZED ATRIX	: : :	310136 N/A 10/28/03 FP	
OJECT NAME	: ARAHO						<u>:</u>	MG/KG	
PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% RE <u>C</u>		DUP % REC	RPD		RPD LIMITS
BENZENE	<0.025	1.00	1.02	102	1.02	102	0	(80 - 120)	20
TUENE	<0.025	1.00	1.01	101	1.00	100	1	(80 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.03	103	1.02	102	1	(80 - 120)	20
TOTAL XYLENES	<0.050	3.00	3.06	102	3.03	101	1	(80 - 120)	20

EMIST NOTES:

N/A

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(Sp Recovery = -----

(Spike Sample Result - Sample Result)

----- X 100

Spike Concentration

(Sample Result - Duplicate Result)

D (Relative Percent Difference) =

----- X 100 Average Result



# GAS CHROMATOGRAPHY QUALITY CONTROL LCS/LCSD

TSST ETCH# CENT	: EPA 8021B MODIFIED : 102803B : INTERA				PINNACLE I DATE EXTR DATE ANAL	: : :	310136 N/A 10/29/03		
PROJECT #	: ARAHO				SAMPLE MA	ATRIX	:	FP	
	: ARAHO				UNITS		:	MG/KG	
PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.03	103	1.06	106	3	(80 - 120)	20
TLUENE	<0.025	1.00	1.01	101	1.03	103	2	(80 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.04	104	1.05	105	1	(80 - 120)	20
TOTAL XYLENES	<0.050	3.00	3.10	103	3.14	105	1	(80 - 120)	20

CEMIST NOTES:

N/A

R

	(Spike Sample Result - Sample Result)	
Recovery =	X 100	
	Spike Concentration	

D (Relative Percent Difference) =

(Sample Result - Duplicate Result) X 100

Average Result



#### GAS CHROMATOGRAPHY QUALITY CONTROL LCS/LCSD

TEST ATCH # LIENT PROJECT #	: EPA 8021B M : 102903 : INTERA : ARAHO	IODIFIED			PINNACLE I DATE EXTR DATE ANAL SAMPLE MA	.D. ACTED YZED ATRIX	: : :	310136 N/A 10/29/03 FP	
ROJECT NAME	: ARAHO				UNITS		<u> </u>	MG/KG	
	SAMPLE	CÓNC	SPIKED	%	DUP	DUP		REC	RPD
PARAMETER	RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD	LIMITS	LIMITS
BENZENE	<0.025	1.00	1.02	102	1.03	103	1	(80-120)	20
DLUENE	<0.025	1.00	1.01	101	1.01	101	0	( 80 - 120 )	20
THYLBENZENE	<0.025	1.00	1.04	104	1.03	103	1	(80 - 120)	20
TOTAL XYLENES	<0.050	3.00	3.06	102	3.02	101	1	( 80 - 120 )	20

----- X 100

HEMIST NOTES:

N/A

	(Spike Sa
Recovery =	

Sample Result - Sample Result)

----- X 100

Spike Concentration

(Sample Result - Duplicate Result)

PD (Relative Percent Difference) =

Average Result

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#### GAS CHROMATOGRAPHY QUALITY CONTROL MS/MSD

TEST SMSD # LIENT PROJECT #	: EPA 8021B N : 310136-01 : INTERA : ARAHO	10DIFIED			PINNACLE I DATE EXTR DATE ANAL SAMPLE MA	.D. ACTED YZED ATRIX	: : :	310136 N/A 10/27/03 FP	
ROJECT NAME	: ARAHO				UNITS		:	MG/KG	
PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.07	107	1.06	106	1	(80 - 120)	20
DLUENE	<0.025	1.00	1.07	107	1.05	105	2	(80 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.10	110	1.08	108	2	(80 - 120)	20
TOTAL XYLENES	<0.050	3.00	3.27	109	3.19	106	2	(80 - 120)	20

HEMIST NOTES:

Recovery =

N/A

(Spike	Sample Result -	Sample Result)

------ X 100

Spike Concentration

(Sample Result - Duplicate Result) _____ X 100

PD (Relative Percent Difference) =

Average Result



#### GAS CHROMATOGRAPHY QUALITY CONTROL MS/MSD

TEST MSD # LIENT PROJECT #	: EPA 8021B N : 310136-16 : INTERA : ARAHO	10DIFIED	DDIFIED PINNACLE I.D. DATE EXTRACTED DATE ANALYZED SAMPLE MATRIX			•	310136 N/A 10/28/03 FP		
ROJECT NAME	: ARAHO				UNITS		:	MG/KG	
PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.025	1.00	1.07	107	1.04	104	3	(80 - 120)	20
	<0.025	1.00	1.08	108	1.03	103	5	(80 - 120)	20
ETHYLBENZENE	<0.025	1.00	1.09	109	1.06	106	3	( 80 - 120 )	20
TOTAL XYLENES	<0.050	3.00	3.26	109	3.17	106	3	(80 - 120)	20

IEMIST NOTES:

N/A

(Spike Sample Result - Sample Result) Recovery =

----- X 100

Spike Concentration

(Sample Result - Duplicate Result)

----- X 100

D (Relative Percent Difference) =

Average Result



## GAS CHROMATOGRAPHY RESULTS

_ _ _ _

TEST		: EPA 8015 MO	DIFIED (DIR	ECT INJECT)				
		: INTERA			Р	INNACLE I.D.	: 310136	
ROJEC	CT #	: ARAHO				ANALYST	: VPH	
ROJEC		: ARAHO						
SAMPLE	<b>-</b>			DATE	DATE	DATE	DIL.	
. #	CLIENT I.D.	_	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR	
	T6-3B	e de la companya de l	NON-AQ	10/23/03	10/27/03	10/29/03	1	
02	T3-2	·	NON-AQ	10/23/03	10/27/03	10/29/03	5	
9	T3-4		NON-AQ	10/23/03	10/27/03	10/29/03	1	
ARAM	ETER	DET. LIMIT	U	NITS	T6-3B	T3-2	T3-4	
FUEL H	YDROCARBONS, C6-C10	10	M	G/KG	< 10	380	< 10	
EVEL H	YDROCARBONS, C10-C22	10	M	G/KG	17	2100	120	
JEL H	YDROCARBONS, C22-C36	10	M	G/KG	46	1400	360	
CALCU	LATED SUM:				63	3880	480	
URRO O-TERF SURRO	GATE: PHENYL (%) GATE LIMITS	(70-130)			102	92	89	

HEMIST NOTES:

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# GAS CHROMATOGRAPHY RESULTS

TEST		: ÉPA 8015 MO	DIFIED (DIRI	ECT INJECT)				
CLIENT		: INTERA			Р	INNACLE I.D.	: 310136	
ROJEC	Τ#	: ARAHO				ANALYST	: VPH	
ROJEC	T NAME	: ARAHO						_
SAMPLE				DATE	DATE	DATE	DIL.	-
. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR	
	T1W-1		NON-AQ	10/23/03	10/27/03	10/29/03	5	
05	T1E-1		NON-AQ	10/23/03	10/27/03	10/28/03	1	
<b>.</b>	RS1-3		NON-AQ	10/23/03	10/27/03	10/28/03	1	_
ARAME	TER	DET. LIMIT	UI	NITS	T1W-1	T1E-1	RS1-3	_
FUEL HY	DROCARBONS, C6-C10	10	M	G/KG	150	11	11	
EVEL HY	DROCARBONS, C10-C22	10	М	G/KG	2500	250	50	
JEL HY	DROCARBONS, C22-C36	10	М	G/KG	1400	77	45	
CALCUL	ATED SUM:				4050	338	106	
	GATE: HENYL (%) GATE LIMITS	(70-130)			85	78	102	



# GAS CHROMATOGRAPHY RESULTS

TEST	: EPA 8015 MO	DIFIED (DIR	ECT INJECT)			
<u>CL</u> IENT	: INTERA			P	INNACLE I.D.	: 310136
ROJECT #	: ARAHO				ANALYST	: VPH
	: ARAHO					
SAMPLE			DATE	DATE	DATE	DIL.
# CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
RS2-2		NON-AQ	10/23/03	10/27/03	10/29/03	2
08 T2-3		NON-AQ	10/23/03	10/27/03	10/29/03	10
T1/3-3	-	NON-AQ	10/23/03	10/27/03	10/28/03	1
	DET. LIMIT	U	NITS	RS2-2	T2-3	T1/3-3
FUEL HYDROCARBONS, C6-C10	10	M	G/KG	23	870	< 10
EVEL HYDROCARBONS, C10-C22	10	M	G/KG	1800	4500	57
EL HYDROCARBONS, C22-C36	i 10	M	G/KG	1100	1900	120
CALCULATED SUM:				2923	7270	177
JRROGATE:					,	
-TERPHENYL (%)				84	110	96
SURROGATE LIMITS	(70-130)					



#### GAS CHROMATOGRAPHY RESULTS

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- -

TEST		: EPA 8015 MO	DIFIED (DIRI	ECT INJECT)			
CLIENT		: INTERA			P	INNACLE I.D.	: 310136
ROJEC	CT #	: ARAHO				ANALYST	: VPH
ROJEC		: ARAHO					
SAMPLE				DATE	DATE	DATE	DIL.
. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
	T4-2B		NON-AQ	10/23/03	10/27/03	10/28/03	1
11	RS3-3		NON-AQ	10/23/03	10/27/03	10/28/03	1
	<u>T4-2</u>		NON-AQ	10/23/03	10/27/03	10/28/03	1
ARAM	ETER	DET. LIMIT	U	VITS	T4-2B	RS3-3	T4-2
FUEL H	YDROCARBONS, C6-C10	10	M	G/KG	< 10	< 10	18
EVEL H	YDROCARBONS, C10-C22	10	M	G/KG	60	180	610
JEL H	YDROCARBONS, C22-C36	10	M	G/KG	120	290	270
CALCUL	ATED SUM:				180	470	898
	GATE: 'HENYL (%) GATE LIMITS	(70-130)		÷	99	86	93
ł



#### GAS CHROMATOGRAPHY RESULTS

TEST		: EPA 8015 MO	DIFIED (DIR	ECT INJECT)			
		: INTERA			P	INNACLE I.D.	: 310136
ROJE	CT #	: ARAHO				ANALYST	: VPH
ROJE	CT NAME	: ARAHO					
SAMPLI	E			DATE	DATE	DATE	DIL.
. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
	T5-2		NON-AQ	10/23/03	10/28/03	10/29/03	1
14	Т6-3		NON-AQ	10/23/03	10/28/03	10/30/03	1
	<u>S6-2</u>		NON-AQ	10/23/03	10/28/03	10/30/03	20
RAM	ETER	DET. LIMIT	U	NITS	T5-2	Т6-3	S6-2
FUEL H	YDROCARBONS, C6-C10	10	M	G/KG	77	< 10	210
EVEL H	YDROCARBONS, C10-C22	10	M	G/KG	1100 D2	17	10000
EL H	YDROCARBONS, C22-C36	10	M	G/KG	51	15	760
CALCU	LATED SUM:				1228	32	10970
	GATE:						
O-TERF	PHENYL (%)			:	94	95	S3
SURRC	GATE LIMITS	(70-130)					

#### HEMIST NOTES:

= Reported from a 2x dilution run on 10/30/03.

S3 = Surrogate diluted out.



#### GAS CHROMATOGRAPHY RESULTS

TEST		: EPA 8015 MO	DIFIED (DIRE	ECT INJECT)			
<u>C</u> LIENT		: INTERA			P	INNACLE I.D.	: 310136
ROJECT #	t	: ARAHO				ANALYST	: VPH
ROJECTN	AME	: ARAHO					_
SAMPLE				DATE	DATE	DATE	DIL.
. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
<b>B</b>	RS4-3.5		NON-AQ	10/23/03	10/28/03	10/29/03	1
17	RS5-1		NON-AQ	10/23/03	10/28/03	10/29/03	1
<b>1</b>	DL1-2		NON-AQ	10/23/03	10/28/03	10/29/03	1
ARAMETE	R	DET. LIMIT	1U	NITS	RS4-3.5	RS5-1	DL1-2
FUEL HYDI	ROCARBONS, C6-C10	10	MO	G/KG	< 10	< 10	340
EUEL HYDE	ROCARBONS, C10-C22	10	MO	S/KG	< 10	370	6300 D10
JEL HYD	ROCARBONS, C22-C36	10	MO	6/KG	< 10	830	850
CALCULAT	ED SUM:					1200	7490
URROGA U-TERPHE SURROGA	TE: NYL (%) TE LIMITS	(70-130)			98	88	99

HEMIST NOTES:

eported from a 10x dilution run on 10/30/03.



#### GAS CHROMATOGRAPHY RESULTS

TEST		: EPA 8015 MO	DIFIED (DIRE	ECT INJECT)			
CLIEN	T	: INTERA			P	INNACLE I.D.	: 310136
ROJE	ECT #	: ARAHO				ANALYST	: VPH
PROJE		: ARAHO					
SAMPI	_E			DATE	DATE	DATE	DIL.
. #	CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
T)	S9-2		NON-AQ	10/23/03	10/28/03	10/30/03	1
20	S15		NON-AQ	10/23/03	10/28/03	10/30/03	10
	S1-1N		NON-AQ	10/23/03	10/28/03	10/30/03	1
ARAI	METER	DET. LIMIT	UI	NITS	S9-2	S15	S1-1N
FUEL	HYDROCARBONS, C6-C10	10	MC	S/KG	10	100	< 10
JEL	HYDROCARBONS, C10-C22	10	MC	G/KG	340	1800	130
JEL	HYDROCARBONS, C22-C36	10	мс	G/KG	800	2900	310
CALCI	JLATED SUM:				1150	4800	440
					70	106	01
SURR	OGATE LIMITS	(70-130)			13		01

HEMIST NOTES: A



#### GAS CHROMATOGRAPHY RESULTS

TEST	: EPA 8015 MO	DIFIED (DIRE	CT INJECT)			
	: INTERA			PI	NNACLE I.D.	310136
ROJECT #	: ARAHO				ANALYST	: VPH
PROJECT NAME	: ARAHO					
SAMPLE			DATE	DATE	DATE	DIL.
. # CLIENT I.D.		MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
S85		NON-AQ	10/23/03	10/28/03	10/30/03	1
23 DL1-2B		NON-AQ	10/23/03	10/28/03	10/29/03	1
ARAMETER	DET. LIMIT	UN	ITS	S85	DL1-2B	
JEL HYDROCARBONS, C6-C10	10	MG	/KG	< 10	380	
FUEL HYDROCARBONS, C10-C22	10	MG	/KG	300	8400 D10	
EL HYDROCARBONS, C22-C36	10	MG	/KG	700	990	
ALCULATED SUM:				1000	9770	
SURROGATE: LTERPHENYL (%) SURROGATE LIMITS	(70-130)		1	81	111	

CHEMIST NOTES: Ported at a 10x dilution run on 10/30/03.



#### GAS CHROMATOGRAPHY RESULTS EXTRACTION BLANK

EST	· EPA 8015 MODIFIED		PINNACLELD	· 310136
BLANK I.D.	: 102803	(201201 // 10201)	DATE EXTRACTED	: 10/28/03
	: INTERA		DATE ANALYZED	: 10/29/03
ROJECT #	: ARAHO		SAMPLE MATRIX	: NON-AQ
PROJECT NAME	: ARAHO		ANALYST	: VPH
ARAMETER		UNITS		
JEL HYDROCARBONS	, C6-C10	MG/KG	< 10	
FUEL HYDROCARBONS	, C10-C22	MG/KG	< 10	
EUEL HYDROCARBONS	, C22-C36	MG/KG	< 10	
SURROGATE:				
TERPHENYL (%)			96	
URROGATE LIMITS	(70-130)			

CHEMIST NOTES:

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EST	: EPA 8015 MODIFIED	(DIRECT INJECT) PI	NNACLE I.D.	: 310136
BLANK I.D.	: 102703	DA	ATE EXTRACTED	: 10/27/03
	: INTERA	DA	ATE ANALYZED	: 10/28/03
ROJECT #	: ARAHO	SA	MPLE MATRIX	: NON-AQ
PROJECT NAME	: ARAHO	AN	ALYST	: VPH
PARAMETER		UNITS		
JEL HYDROCARBON	NS, C6-C10	MG/KG	< 10	
FUEL HYDROCARBON	NS, C10-C22	MG/KG	< 10	
JEL HYDROCARBON	NS, C22-C36	MG/KG	< 10	
SURROGATE:				
TERPHENYL (%)			96	
JRROGATE LIMITS	(70-130)			

### CHEMIST NOTES:

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PINNACLE LABORATORIES



# GAS CHROMATOGRAPHY QUALITY CONTROL LCS/LCSD

ST	: EPA 8015 MC	DIFIED (DI	RECT INJECT	)	PINNACLE	I.D.	:	310136	
S/LCSD #	: 102703				DATE EXTR	RACTED	:	10/27/03	
CLIENT	: INTERA				DATE ANAL	YZED	:	10/28/03	
ROJECT #	: ARAHO				SAMPLE M	ATRIX	:	NON-AQ	
ROJECT NAME	: ARAHO				UNITS		:	MG/KG	
	SAMPLE	CONC	SPIKED	%	DUP	DUP		REC	RPD
PARAMETER	RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD	LIMITS	LIMITS
JEL HYDROCARBONS	<10	200	204	102	203	102	0	(70-130)	20

CHEMIST NOTES:

(Spike Sample Result - Sample Result)

X 100

Spike Concentration

(Sample Result - Duplicate Result)

D (Relative Percent Difference) =

# PINNACLE LABORATORIES

# GAS CHROMATOGRAPHY QUALITY CONTROL LCS/LCSD

EST CS/LCSD # CLIENT	: EPA 8015 MC : 102803 : INTERA	DDIFIED (DI	IRECT INJECT	)	PINNACLE I DATE EXTR DATE ANAL	.D. ACTED .YZED	: : :	310136 10/28/03 10/29/03	
PROJECT # ROJECT NAME	: ARAHO : ARAHO				SAMPLE MA	ATRIX	:	NON-AQ MG/KG	
	SAMPLE	CONC	SPIKED	%	DUP	DUP		REC	RPD
PARAMETER	RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD	LIMITS	LIMITS
UEL HYDROCARBONS	<10	200	183	92	194	97	6	(70-130)	20

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CHEMIST NOTES:

N/A

(Spike Sample Result - Sample Result)

X 100

Spike Concentration

(Sample Result - Duplicate Result)

PD (Relative Percent Difference) =



# GAS CHROMATOGRAPHY QUALITY CONTROL MSMSD

EST SMSD #	: EPA 8015 MC : 310136-01	DIFIED (DI	RECT INJECT	)	PINNACLE DATE EXTR	I.D. RACTED	:	310136 10/27/03 10/28/03	
PROJECT # ROJECT NAME	: ARAHO : ARAHO				SAMPLE MAL	ATRIX	• : :	NON-AQ MG/KG	
	SAMPLE	CONC	SPIKED	%	DUP	DUP		REC	RPD
PARAMETER	RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD	LIMITS	LIMITS
JEL HYDROCARBONS	<10	200	196	98	211	106	7	(70-130)	20

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CHEMIST NOTES:

N/A

(Spike Sample Result - Sample Result)

X 100

Spike Concentration

(Sample Result - Duplicate Result)

----- X 100

PD (Relative Percent Difference) =



# GAS CHROMATOGRAPHY QUALITY CONTROL MSMSD

EST	: EPA 8015 MC	DIFIED (DI	RECT INJECT	-)	PINNACLE I	.D.	:	310136	
ISMSD #	: 310136-17				DATE EXTR	ACTED	:	10/28/03	
CLIENT	: INTERA				DATE ANAL	YZED	:	10/29/03	
PROJECT #	: ARAHO				SAMPLE MA	ATRIX	:	NON-AQ	
ROJECT NAME	: ARAHO				UNITS		:	MG/KG	
	SAMPLE	CONC	SPIKED	%	DUP	DUP		REC	RPD
PARAMETER	RESULT	SPIKE	SAMPLE	REC	SPIKE	% REC	RPD	LIMITS	LIMITS
UEL HYDROCARBONS	370	200	659	145 <b>M4</b>	607	119	8	(70-130)	20

#### CHEMIST NOTES:

M4 = % Recovery is outside of PLI criteria.

(Spike Sample Result - Sample Result)

X 100

----- X 100

Spike Concentration

(Sample Result - Duplicate Result)

PD (Relative Percent Difference) =



STL Pensacola 3355 McLemore Drive - Pensacola FL 32514 Telephone: (850) 474-1001 Fax: (850) 478-2671

### Analytical Report

For: Ms. Jacinta Tenorio Pinnacle Laboratories 2709-D Pan American Freeway Northeast Albuquerque, NM 87107

CC:

Order Number: C310776 SDG Number: Client Project ID: Project: 310136, NMOCD-ARAHO Report Date: 11/12/2003 Sampled By: Client Sample Received Date: 10/28/2003 Requisition Number: Purchase Order: 310136

Lance Larson, Project Manager 11arson@stl-inc.com

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Order: C310776

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Date Received: 10/28/2003

## Sample Summary

Client: Pinnacle Laboratories Project: 310136, NMOCD-ARAHO

Client Sample ID	Lab Sample ID	Matrix	Date Sampled
T6-3B/310136-01	C310776*1	Solid	10/23/2003 11:44
T3-2/310136-02	C310776*2	Solid	10/23/2003 12:06
T3-4/310136-03	C310776*3	Solid	10/23/2003 12:12
T1W-1/310136-04	C310776*4	Solid	10/23/2003 12:25
T1E-1/310136-05	C310776*5	Solid	10/23/2003 12:48
RS1-3/310136-06	C310776*6	Solid	10/23/2003 13:45
RS2-2/310136-07	C310776*7	Solid	10/23/2003 13:57
T2-3/310136-08	C310776*8	Solid	10/23/2003 14:10
T1/3-3/310136-09	C310776*9	Solid	10/23/2003 14:35
T4-2B/310131-10	C310776*10	Solid	10/23/2003 15:09
RS3-3/310136-11	C310776*11	Solid	10/23/2003 16:41
T4-2/310136-12	C310776*12	Solid	10/23/2003 17:00
T5-2/310136-13	C310776*13	Solid	10/23/2003 17:13
T6-3/310136-14	C310776*14	Solid	10/23/2003 17:27
F6-2/310136-15	C310776*15	Solid	10/23/2003 17:39
RS4-3.5/310136-16	C310776*16	Solid	10/23/2003 17:52
RS5-1/310136-17	C310776*17	Solid	10/23/2003 18:00
DL1-2/310136-18	C310776*18	Solid	10/23/2003 18:20
S9-2/310136-19	C310776*19	Solid	10/23/2003 18:33
S15/310136-20	C310776*20	Solid	10/23/2003 18:47
S1-1N/310136-21	C310776*21	Solid	10/23/2003 18:55
S85/310136-22	C310776*22	Solid	10/23/2003 18:25
DL1-2B/310136-23	C310776*23	Solid	10/23/2003 19:20
C-1/310136-24	C310776*24	Solid	10/24/2003 08:30
C-3/310136-25	C310776*25	Solid	10/24/2003 08:33
C-5/310136-26	C310776*26	Solid	10/24/2003 08:36
C-7/310136-27	C310776*27	Solid	10/24/2003 08:42
C-8/310136-28 .	C310776*28	Solid	10/24/2003 08:47
C-6/310136-29	C310776*29	Solid	10/24/2003 08:54
C-4/310136-30	C310776*30	Solid	10/24/2003 08:58
C-2/310136-31	C310776*31	Solid	10/24/2003 09:03
C-9/310136-32	C310776*32	Solid	10/24/2003 09:10
C-10/310136-33	C310776*33	Solid	10/24/2003 09:15
C-11/310136-34	C310776*34	Solid	10/24/2003 09:20
C-13/310136-35	C310776*35	Solid	10/24/2003 09:28

Lab Sample ID	Description				Matrix	Date Rece	eived D	ate Sampi	led SDC
10776-1	T6-38/310136-01	· · · · · · · · · · · · · · · · · · ·			Solid	10/28/03	1	.0/23/03 1	L1:44
10776-2	T3-2/310136-02				Solid	10/28/03	1	.0/23/03 1	L2:06
10776-3	T3-4/310136-03				Solid	10/28/03	1	.0/23/03 1	12:12
10776-4	T1W-1/310136-04				Solid	10/28/03	1	.0/23/03 1	2:25
10776-5	T1E-1/310136-05				Solid	10/28/03	1	.0/23/03 1	2:48
			Lab S	Sample IDs					
Parameter		Units	10776-1	10776-2	1077	6-3	10776-	4	10776-5
Chloride	(9251)								
Chloride		mg/kg dw	7300	2700	5800	•	990		2700
Percent Solids	5		79	86	77		80		80
Dilution Facto	or		100	50	50		50		50
Prep Date			10/30/03	10/30/03	10/3	0/03	10/30/	03	10/30/03
Analysis Date			10/30/03	10/30/03	10/3	0/03	10/30/	03	10/30/03
Batch ID			CKS077S	CKS077S	CKSC	77S	CKS077	S	CKS077S
Prep Method			SOP 885	SOP 885	SOP	885 -	SOP 88	5	SOP 885
Analyst			CR	CR	CR		CR		CR

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Lab Sample 1	D Description			Matrix	Date Receiv	ved Date Sa	ampled SDG
10776-6	RS1-3/310136-06			Solid	10/28/03	10/23/0	)3 13:45
10776-7	RS2-2/310136-07			Solid	10/28/03	10/23/0	3 13:57
10776-8	T2-3/310136-08			Solid	10/28/03	10/23/0	03 14:10
10776-9	T1/3-3/310136-09			Solid	10/28/03	10/23/0	3 14:35
10776-10	T4-2B/310131-10			Solid	10/28/03	10/23/0	3 15:09
		Lab	Sample IDs				
Parameter	Units	107766	10776-7	1077	76-8	10776-9	10776-10
Chloride	ma/ka c	tw 1300	2800	3600	) (	600	9700
Percent Soli	ids	92	91	86		31	84
Dilution Fac	ctor	50	50	50	5	50	250
Prep Date		10/30/03	10/30/03	10/3	0/03 1	.0/30/03	10/30/03
Analysis Dat	te	10/30/03	10/30/03	10/3	10/03	.0/30/03	10/30/03
Batch ID		CKS077S	CKS077S	CKSC	)77S (	KS077S	CKS077S
Prep Method		SOP 885	SOP 885	SOP	885 5	OP 885	SOP 885

Lab Sample ID	Description				Matrix	Date Rece	ived	Date Sam	pled	SDG#
10776-11	RS3-3/310136-11	· · · · · · · · · · · · · · · · · · ·			Solid	10/28/03		10/23/03	16:41	
10776-12	T4-2/310136-12				Solid	10/28/03		10/23/03	17:00	
10776-13	T5-2/310136-13				Solid	10/28/03		10/23/03	17:13	
10776-14	T6-3/310136-14				Solid	10/28/03		10/23/03	17:27	
10776-15	F6-2/310136-15				Solid	10/28/03		10/23/03	17:39	
			Lab S	Sample IDs						
Parameter		Units	10776-11	10776-12	1077	6-13	10776	5-14	10776	-15
Chloride	(9251)									
Chloride		mg∕kg dw	6500	11000	6300	1	8000		2800	
Percent Solids	5		88	79	78		80		88	
Dilution Facto	or		100	250	100		100		50	
Prep Date			10/30/03	10/30/03	10/3	0/03	10/30	)/03	10/30,	/03
Analysis Date			10/30/03	10/30/03	10/3	0/03	10/30	)/03	10/30,	/03
Batch ID			CKS077S	CKS0775	CKSO	775	CKS07	75	CKS077	7S
Prep Method			SOP 885	SOP 885	SOP	885 -	SOP 8	85	SOP 88	35
Analyst			CR	CR	CR		CR		CR	

Lab Sample ID	Description			Matrix	Date Reco	eived	Date San	nbjeq 20
10776-16	RS4-3.5/310136-16			Solid	10/28/03		10/23/03	17:52
10776-17	RS5-1/310136-17			Solid	10/28/03		10/23/03	18:00
10776-18	DL1-2/310136-18			Solid	10/28/03		10/23/03	18:20
10776-19	S9-2/310136-19			Solid	10/28/03		10/23/03	18:33
10776-20	S15/310136-20			Solid	10/28/03		10/23/03	18:47
			Lab Sample IDs					
Parameter	Units	10776-	16 10776-1	7 <b>107</b>	76-18	10776	5-19	10776-20
Chloride	(3231) ma/ka	<b>t</b> u 2100	630	150	h	5400		11000
Percent Solids	, en (en (en (en (en (en (en (en (en (en	90	92	83	-	85		94
Dilution Facto	)r	50	50	50		50		250
Prep Date		10/30/	03 10/30/03	3 10/3	30/03	10/30	)/03	10/30/03
Analysis Date		10/30/	03 10/30/0	3 10/3	30/03	10/30	0/03	10/30/03
Batch ID		CKS077	S CKS077S	CKS	077S	CKS07	75	CKS077S
Prep Method		SOP 88	5 SOP 885	SOP	885 .	SOP 8	85	SOP 885
Analyst		CR	CR	CR		CR		CR

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Lab Sample ID	Description				Matrix	Date Rece	eived	Date Sam	bled	SDG#
10776-21	S1-1N/310136-21				Solid	10/28/03		10/23/03	18:55	
10776-22	S85/310136-22				Solid	10/28/03		10/23/03	18:25	
10776-23	DL1-2B/310136-23				Solid	10/28/03		10/23/03	19:20	
10776-24	C-1/310136-24				Solid	10/28/03		10/24/03	08:30	
10776-25	C-3/310136-25				Solid	10/28/03		10/24/03	08:33	
			Lab S	Sample IDs						
Parameter		Units	10776-21	10776-22	1077	76-23	1077	5-24	10776	-25
	(32)1)		2400	1100	1.00		1000		4100	
Chioride Demost Solid		mg∕kg aw	3400	1100	1400		1800		4100	
Percent Solius			65	87	62 50		91		91	
Dilution Facto	or		50	50	50 10 / 2	0./07	50 10 (20		50	(07
Prep Date			10/30/03	10/30/03	10/3	0/03	10/30	)/03	10/30/	/03
Analysis Date			10/30/03	10/30/03	10/3	0/03	10/30	)/03	10/30/	/03
Batch ID			CKS078S	CKS078S	CKS0	785	CKS07	78S	CKS078	35
Prep Method			SOP 885	SOP 885	SOP	885	SOP 8	385	SOP 88	35
Analyst			CR	CR	CR		CR		CR	

			Analytica	al Data Report						
Lab Sample ID	Description				Matrix	Date Rece	eived D	ate Sam	ງled	SDG#
10776-26	C-5/310136-26				Solid	10/28/03	10	0/24/03	08:36	
10776-27	C-7/310136-27				Solid	10/28/03	10	0/24/03	08:42	
10776-28	C-8/310136-28				Solid	10/28/03	10	0/24/03	08:47	
10776-29	C-6/310136-29				Solid	10/28/03	10	0/24/03	08:54	
10776-30	C-4/310136-30				Solid	10/28/03	10	0/24/03	08:58	
			Lab S	Sample IDs						
Parameter		Units	10776-26	10776-27	1077	6-28	10776-2	29	10776	530
Chloride	(9251)	<u></u>			₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	<u>, , , , , , , , , , , , , , , , , , , </u>				
Chloride		mg/kg dw	9300	730	2400	)	3900		3000	
Percent Solids	5		96	95	98		86		95	
Dilution Facto	or		250	50	50		50		50	
Prep Date			10/30/03	10/30/03	10/3	0/03	10/30/0	03	10/30	)/03
Analysis Date			10/30/03	10/30/03	10/3	0/03	10/30/0	)3	10/30	/03
Batch ID			CKS078S	CKS078S	CKSO	785	CKS0785	5	CKS07	'8S
Prep Method			SOP 885	SOP 885	SOP	885	SOP 885	5	SOP 8	85
Anal <u>y</u> st			CR	CR	CR		CR		CR	

Lab Sample ID	Description				Matrix	Date Receiv	ved Date S	ampled	SDG#
10776-31	C-2/310136-31				Solid	10/28/03	10/24/0	03 09:03	
10776-32	C-9/310136-32				Solid	10/28/03	10/24/0	03 09:10	
10776-33	C-10/310136-33				Solid	10/28/03	10/24/0	03 09:15	
10776-34	C-11/310136-34				Solid	10/28/03	10/24/0	03 09:20	
10776-35	C-13/310136-35				Solid	10/28/03	10/24/0	03 09:28	
			Lab S	ample IDs					
Parameter		Units	10776-31	107 <b>76-32</b>	1077	6-33 1	0776-34	10776-	-35
Chloride	(3231)	mg/kg dw	11000	820	3000	2	600	8900	
Percent Solids	5		95	95	85	g	7	95	
Dilution Facto	or		500	50	50	5	0	500	
Prep Date			10/30/03	10/30/03	10/3	0/03 1	.0/30/03	10/30/	′03
Analysis Date			10/30/03	10/30/03	10/3	0/03 1	.0/30/03	10/30/	03
Batch ID			CKS078S	CKS078S	CKS0	78S C	KS078S	CKS078	S
Prep Method			SOP 885	SOP 885	SOP	885 S	OP 885	SOP 88	5
Analyst			CR	CR	CR	C	IR .	CR	

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Lab Sample ID	Description				Matrix	Date Reco	eived Date Sa	ampled SDG#
10776-36	Method Blank				Solid	10/28/03		
10776-37	Lab Control Sta	ndard % Recov	ery		Solid	10/28/03		
10776-38	Matrix Spike %	Matrix Spike % Recovery						
10776-39	Matrix Spike Du	plicate % Rec	overy		Solid	10/28/03		
10776-40	Method Blank				Solid	10/28/03		
	_		Lab S	ample IDs				
Parameter		Units	10776-36	10776-37	1077	76-38	10776-39	10776-40
Chloride	(9251)							
Chloride		mg/kg dw	<100	100 %	94 %	6	94 %	<100
Dilution Facto	or .		50					50
Prep Date			10/30/03					10/30/03
Analysis Date			10/30/03					10/30/03
Batch ID			CKS077S	CKS077S	CKSC	)77S	CKS077S	CKS078S
Prep Method			SOP 885					SOP 885
Analyst			CR					CR

Lab Sample ID         Description         Matrix         Date Received         Date Sampled         SOC           10776-41         Lab Control Standard % Recovery         Solid         10/28/03         10/28/03         10/28/03           10776-42         Matrix Spike % Recovery         Solid         10/28/03         10/28/03         10/28/03           10776-43         Matrix Spike Duplicate % Recovery         Solid         10/28/03         10/28/03           Parameter         Units         10776-41         10776-42         10776-43           Chloride (9251)         %         96 %         97 %           Chloride ID         %         100 %         96 %         97 %			Analytica	al Data Report				
10776-41       Lab Control Standard % Recovery       Solid       10/28/03         10776-42       Matrix Spike % Recovery       Solid       10/28/03         10776-43       Matrix Spike Duplicate % Recovery       Solid       10/28/03         Lab Sample IDs         Parameter       Units       10776-41       10776-42       10776-43         Chloride (9251)         Chloride       %       100 %       96 %       97 %         Batch ID       (KS0785       (KS0785       (KS0785	Lab Sample ID	Description			Matrix	Date Received	Date Sampled	SDG#
10776-42       Matrix Spike % Recovery       Solid       10/28/03         10776-43       Matrix Spike Duplicate % Recovery       Solid       10/28/03         Lab Sample IDs         Parameter       Units       10776-41       10776-42       10776-43         Chloride (9251)         Chloride (9251)         Chloride % 100 % 96 % 97 %         CKS078S         CKS078S	10776-41	Lab Control Standard % Reco	overy	Solid	10/28/03		······	
10776-43       Matrix Spike Duplicate % Recovery       Solid       10/28/03         Lab Sample IDs       Lab Sample IDs       10776-42       10776-43         Parameter       Units       10776-41       10776-42       10776-43         Chloride (9251)       %       100 %       96 %       97 %         Chloride ID       %       100 %       96 %       97 %         Chloride ID       %       100 %       96 %       97 %	10776-42	Matrix Spike % Recovery		Solid	10/28/03			
Lab Sample IDs           Parameter         Units         10776-41         10776-42         10776-43	10776-43	Matrix Spike Duplicate % Re	ecovery		Solid	10/28/03		
Parameter         Units         10776-41         10776-42         10776-43           Chloride (9251)         K         96 %         97 %           Chloride         %         100 %         96 %         97 %           Barch ID         (KS078S)         (KS078S)         (KS078S)         (KS078S)			Lab S	Sample IDs				
Chloride (9251) Chloride % 100 % 96 % 97 % Parch ID (KS0785 (KS0785	Parameter	Units	10776-41	10776-42	1077	′6-43 		
Chloride         %         100 %         96 %         97 %           Batch ID         (KS078S         (KS078S         (KS078S	Chloride	(9251)						
	Chloride	%	100 %	96 %	97 %	Ś		
	Batch ID		CKS078S	CKS078S	CKSC	785		

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.

PRUJECT SAMPLE INSPECTION FORM	
Lab Order #: <u>C310776</u>	Date Received: 10/28 63
1. Was there a Chain of Custody? Yes No*	8. Were samples checked for Yes No ⁺ N/. preservative? (Check pH of all H ₂ O requiring preservative (STL-PN SOP 917) except VOA vials that require
2. Was Chain of Custody properly Yes No* filled out and relinquished?	9. Is there sufficient volume for Yes No* N/ analysis requested?
3. Were all samples properly Yes No* labeled and identified?	10. Were samples received within Yes No ⁺ Holding Time? (REFER TO STL-SOP 1040)
4. Were samples received cold? (Yes) No* N/A (Criteria: 2° - 6°C: STL-SOP 1055)	11. Is Headspace visible > ¼" in Yes* No N// diameter in VOA vials?*
5. Did samples require splitting or Yes* (No)	12. Were Trip Blanks Received? Yes No
compositing*?	13. If sent, were matrix spike Yes No* N/A bottles returned?
6. Were samples received in proper containers for analysis	14. If sent, were T-Handles Yes No* N72 returned?
7. Were all sample containers Yes No ⁺	15. If any issues, how was PM PSIF Verbal [
Airbill Number(s): $12878680743430096$ Cooler Numbers & Temp(s) (°C): $6in+47$	Shipped By UPS FedX HD BUS ABX (HD - Hand Delivery)
Airbill Number(s): <u>1287868 0/ 4345 0096</u> Cooler Numbers & Temp(s) (°C): <u>Climit 4</u> (IE. 340 Out of Control Events and Inspection Comments 1-3. COC/Sample ID/COC discrepancy:	Shipped By UPS FedX HD BUS ABX (HD - Hand Delivery) CCCCCK8 LIST THERMOMETER NUMBER FOR VERIFICATION) (list sample IDs/Tests where appropriate):
Airbill Number(s): <u>[2878(68 0] (34: 0096</u> Cooler Numbers & Temp(s) (°C): <u>(limit 4</u> (IE. 340 Out of Control Events and Inspection Comments 1-3. COC/Sample ID/COC discrepancy: 4. Insufficient Ice. Delay in delivery. Other	Shipped By UPS FedX HD BUS ABX (HD - Hand Delivery) C CCF (( L-4°C-CCK8 LIST THERMOMETER NUMBER FOR VERIFICATION) (list sample IDs/Tests where appropriate):
Airbill Number(s): <u>[2878(68 C)] (34</u> ; CO46 Cooler Numbers & Temp(s) (°C): <u>Clime 4</u> (IE. 340 Out of Control Events and Inspection Comments 1-3. COC/Sample ID/COC discrepancy: 4. Insufficient Ice Delay in delivery Other 5. Samples were Split Composited Requi 6. Improper Containers (ID/Size/desc):	Shipped By UPS FedX HD BUS ABX         (HD - Hand Delivery)         CCE c(         (L-4°C-CCK8 LIST THERMOMETER NUMBER FOR VERIFICATION)         (list sample IDs/Tests where appropriate):         • □         ested by: Client □ PM □ Other:
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Airbill Number(s):	Shipped By UPS FedX HD BUS ABX         (HD - Hand Delivery)         (UFC CCK8 - LIST THERMOMETER NUMBER FOR VERIFICATION)         (list sample IDs/Tests where appropriate):         ested by: Client DPM Other:
Airbill Number(s):       [2878:68 Of U345 CO46         Cooler Numbers & Temp(s) (°C):       (im 4"         Out of Control Events and Inspection Comments         1-3. COC/Sample ID/COC discrepancy:         4. Insufficient Ice       Delay in delivery         Other         5. Samples were Split       Composited         7. Broken bottles/Test:         8. Incorrect pH:         9. Test/Matrix/Volume:         10. Out of Holding Time/Test:         11. VOA headspace > 1/4"         (list ~ size)         List additional comments by above number:	Shipped By       UPS       FedX       HD       BUS       ABX         (HD - Hand Delivery)       (HD - Hand Delivery)         (IIst sample IDs/Tests where appropriate):         Image: Steed by:       Client       PM       Other:
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According to EPA, %" of headspace is acceptable in 40 ml vials requiring volatile analysis.

# SEVERN TRENT STL

### **Organic Data Qualifiers for Final Report**

В	The analyte was detected in the method blank and in the client's sample.
D	The result was obtained from a dilution.
E	The result exceeds the calibration range.
J	Estimated value because the analyte concentration is less than the reporting limit.
M	A matrix effect was present.
Ν	Presumptive evidence of a compound. The compound was identified qualitatively or as a Tentatively Identified Compound.
N/C	Not Calculable. Either the sample spiked was > 4X spike concentration, or the compound was diluted out, or the results of sample duplicate analysis were <rl.< td=""></rl.<>
Р	Second-column or detector confirmation exceeded method criteria. Appropriate value is reported and data is flagged/qualified as instructed by method/regulation.
U or < or ND *	The analyte was not detected. The result is not within control limit(s).

### Inorganic Data Qualifiers for Final Report

B	The analyte was detected in the method blank and in the client's sample. The reported value is estimated because of the presence of interference
J	Estimated value because the analyte concentration is less than the reporting limit
N	The spiked sample recovery is not within control limits.
N/C	Not Calculable. Either the sample spiked was > 4X spike concentration, or the compound was diluted out, or
	the results of sample duplicate analysis were <rl.< td=""></rl.<>
U or < or ND	The analyte was not detected.
*	Duplicate analysis not within control limits
M	The duplicate injection precision was not met.
S	The reported value was determined by the Method of Standard Addition (MSA).
W	Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is
	less than 50% of spike absorbance and post spike recovery is greater than or equal to 40%, the sample is
	flagged with a "W" and no further action is required.
+	The Standard Additions Correlation Coefficient is <0.995.

It is permissible to submit an Out-of-Control Events/Corrective Action form and/or Case Narrative in lieu of using above qualifiers.

When the laboratory receives a sample that does not meet EPA requirements for sample collection, preservation or holding time, the laboratory is required to reject the samples. The client must be notified and asked whether the lab should proceed with analysis. Data from any samples that do not meet sample acceptance criteria (collection, preservation and holding time), must be flagged, or noted on a corrective action form or case narrative, or addressed on the Project Sample Inspection Form (PSIF) in an unambiguous manner clearly defining the nature and substance of the variation. NPDES samples from North Carolina that do not meet EPA requirements for sample collection, preservation or holding time are non-reportable for NPDES compliance monitoring.

Abbreviations		
ND		Not Detected at or above the STL Pensacola reporting limit (RL)
NS		Not Submitted
NA		Not Applicable
MDL	•	STL Pensacola Method Detection Limit
RL		STL Pensacola Reporting Limit
NoMS		Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD)

#### Florida Projects Inorganic/Organic

Refer to FL DEP 62-160; Table 4 Data Qualifier Codes. FL DEP Rule 62-160, Table 1 lists the Florida sites which require data qualifiers.

#### Arizona DEQ Projects

Any qualified data submitted to Anzona DEQ (ADEQ) after January 1, 2001 must be designated using the Arizona Data Qualifiers as developed by the Arizona ELAC technical subcommittee. Refer to the ADEQ qualifier list.

Severn Trent Laboratories Inc. STL Pensacola • 3355 McLemore Dr • Pensacola, FL 32514 Tel 850 474 1001 Fax 850 484 5315 • www.stl-inc.com



### STL PENSACOLA Certifications, Memberships & Affiliations

Alabama Department of Environmental Management, Laboratory ID No. 40150 (Drinking Water by Reciprocity with FL) Arizona Department of Health Services, Lab ID No. AZ0589 (Hazardous Waste & Wastewater) Arkansas Department of Pollution Control and Ecology, (88-0689) (Environmental) California Department of Health Services, ELAP Laboratory ID No. I-2510 (Hazardous Waste and Wastewater) Connecticut Department of Health Services, Connecticut Lab Approval No. PH-0697 (D W, H W and Wastewater) Florida DOH, NELAP Laboratory ID No. E81010 (Drinking Water, Hazardous Waste and Wastewater) Florida DEP/DOH CompQAP # 980156 Illinois Environmental Laboratory Accreditation Program (ELAP), NELAP Laboratory ID No. 200041 (Wastewater and Hazardous Waste) Iowa Department of Natural Resources, Laboratory ID No. 367 (WW & UST) Kansas Department of Health & Environment, NELAP Laboratory ID No. E10253 (Wastewater and Hazardous Waste) Kentucky NR&EPC, Laboratory ID No. 90043 (Drinking Water) Louisiana DEQ, LELAP, NELAP Laboratory ID No. 02075, Agency Interest ID 30748 (Environmental) Maryland DH&MH Laboratory ID No. 233 (Drinking Water by Reciprocity with Florida) Massachusetts DEP, Laboratory ID No. M-FL094 (Wastewater) Michigan Bureau of E&OccH, Laboratory ID No.9912 (Drinking Water by Reciprocity with Florida) New Hampshire DES ELAP, NELAP Laboratory ID No. 250502 (Drinking Water & Wastewater) New Jersey DEP&E, NELAP Laboratory ID No. FL006 (Wastewater and Hazardous Waster) North Carolina DENR, Laboratory ID No. 314 (Hazardous Waste and Wastewater) North Dakota DH&Consol Labs, Laboratory ID No. R-108 Wastewater and Hazardous Waste by Reciprocity with Florida) Oklahoma Department of Environmental Quality, Laboratory ID No. 9810 (Hazardous Waste and Wastewater) Pennsylvania Department of Environmental Resources, NELAP Laboratory ID No. 68-467 (Drinking Water & Wastewater) South Carolina DH&EC, Laboratory ID No. 96026 (Wastewater & Solids/Hazardous Waste by Reciprocity with FL) Tennessee Department of Health & Environment, Laboratory ID No. 02907 (Drinking Water) Virginia Department of General Services, Laboratory ID No. 00008 (Drinking Water by Reciprocity with FL) West Virginia DOE, Office of Water Resources, Laboratory ID No. 136 (Haz Waste and Wastewater) AIHA (American Industrial Hygiene Association) Accredited Laboratory, Laboratory ID No. 100704. Participant in AIHA sponsored Laboratory PAT Rounds EPA ICR (Information Collection Rule) Approved Laboratory, Laboratory ID No. ICRFL031 NFESC (Naval Facilities Engineering Services Center) USACE (United States Army Corps. of Engineers), MRD STL Pensacola also has a foreign soil permit to accept soils from locations other than the continental United States. Permit No. S-37599 Total Pages of Report certlist\condcert.lst revised 10/15/03

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Developed Network Project Manager: J	Jacinta Tenorio		ANALYSIS REQUEST		Π
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nterlab Chain of Custody Date: 0.22 Page: Sof X	ANALYSIS REQUEST	z onuqz GC/WZ /R /WZ (8560) /WZ (8560) /WZ (8560) /WZ (8560) /WZ (8560) /WZ (8560) /WZ (8560) ////////////////////////////////////	stals-13 PP List stals-13 PP List ssolved Fe, Mn, Pb Ssolved Fe, Mn, Pb D C C C C C C C C C C C C C C C C C C	илі 4 4 4 4 4 4 4 4 4 4 4 4 4	×										SAMPLES SENT TO: RELINQUISED BY: 1. RELINQUISED BY: 2.	PENSACOLA - STL-FL X Signature / // / Time, O Signature: Time:	ESL-OR / (ThUBUT 5	ATEL - AZ Printed Name ( Date:	ATEL-MARION VIN (XYNX) (U.Y. (. V)	ATEL - MELMUKE Primacie Laboratories, Inc. Company EHL 1. RECEIVED BY: 1. RECEIVED BY: 2.	GEL Signature Signature Signature: Signature: Time:	U OF MIAMI I VILLECOURTON (000	WCAS Date: Date: Date: $O(\hat{x}) \in Printed Name:$ Date: Data	Company STOWY Company
Pinnacle Laboratories, Inc.	Network Project Manager: Jacinta Tenorio	Pinnacle Laboratories, Inc. 2709-D Pan American Freeway, NE Albuquerque, NM 87107 (505) 344-3777 Fax (505) 344-4413 (505) 344-3777 Fax (505) 344-4413	ARCRA (8) Alsis	SAMPLE ID DATE TIME MATRIX LAB ID 😤 FC	Stim/310136-21 10/23 1855 MAG	Se-5/ 1-22 10/23 1825	D21-2B/ -23 1022 1920	C-1/ -24 10/24 0830	r-3 -25 1 1×35	053 -26 0836	C-7 -27 0842	C-S -28 0847	1-6. 128 bisy	C. 4/310136-30 U 0558 U	PROJECT INFORMATION SAMPLE RECEIPT	PROJECT #: 21012 6 Total Number of Containers	PROJ. NAME: PRATU Chain of Custody Seals	QC LEVEL: 81D. IV Received Intact?	DC REQUIRED MS MSD BLANK Received Good Cond./Cold		DUE DATE: COMMENTS:	RUSH SURCHARGE:	CLIENT DISCOUNT:	REQUIRED: YES NO

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American Environmental Network (NM), Inc.

# CHAIN OF CUSTODY

(Continuation Sheet)

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AEN(NM) Accession #:	310136			8 8 3			
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DISTRIBUTION: White - AEN (NM), Canary - Originator

File	: C:\HPCHEM\2\	DATA\1028	03F\1028	30303.D	
Operator	: VPH				
Acquired	: 28 Oct 2003	12:37	using	AcqMethod	TPH1027.M
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File : C:\HPCHEM\2\DATA\102803F\10280304.D Operator : VPH Acquired : 28 Oct 2003 13:05 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: GRO CCV-200PPB Misc Info : GC4-121-10 Vial Number: 3



File : C:\HPCHEM\2\DATA\102803F\10280305.D
Operator : VPH
Acquired : 28 Oct 2003 13:33 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: DRO CCV-200PPB
Misc Info : GC4-121-1-09
Vial Number: 4


File :	C:\HPCHEM\2\DATA\102803F\10280306.D		
Operator :	VPH		
Acquired :	28 Oct 2003 14:01 using AcqMethod TPH1027.M		
Instrument :	FID-1		
Sample Name:	SRB 1027		
Misc Info :	10G/10ML 10/27		
Vial Number:	5		



File :	C:\HPCHEM\2\DATA\102903F\10290306.D		
Operator :	VPH		
Acquired :	29 Oct 2003 11:36 using AcqMethod TPH1027.M		
Instrument :	FID-1		
Sample Name:	SRB 1028		
Misc Info :	10G/10ML 10/28		
Vial Number:	5		



File :	C:\HPCHEM\2\DATA\102903F\10290311.D		
Operator :	VPH		
Acquired :	29 Oct 2003 13:57 using AcqMethod TPH1027.M		
Instrument :	FID-1		
Sample Name:	310136-01 RR		
Misc Info :	10G/10ML 10/27		
Vial Number:	10		



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Operator : VPH
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Instrument : FID-1
Sample Name: 310136-02 RR 5X
Misc Info : 10G/10ML 10/27 200UL/1ML
Vial Number: 15



File	:	C:\HPCHEM\2\DATA\102903F\10290314.D		
Operator	:	VPH		
Acquired	:	29 Oct 2003 15:21 using AcqMethod TPH1027.M		
Instrument	:	FID-1		
Sample Name: 310136-03 RR				
Misc Info	:	10G/10ML 10/27		
Vial Number	:	13		



File	:	C:\HPCHEM\2\DATA\102903F\10290319.D		
Operator	:	VPH		
Acquired	:	29 Oct 2003 17:42 using AcqMethod TPH1027.M		
Instrument	:	FID-1		
Sample Name: 310136-04 RR 5X				
Misc Info	: 10G/10ML 10/27 200UL/1ML			
Vial Number	:	17		



File :	C:\HPCHEM\2\DATA\102903F\10290312.D		
Operator :	VPH		
Acquired :	29 Oct 2003 14:25 using AcqMethod TPH1027.M		
Instrument :	FID-1		
Sample Name:	310136-05 RR		
Misc Info :	10G/10ML 10/27		
Vial Number:	11		



: C:\HPCHEM\2\DATA\102803F\10280322.D File Operator : VPH Acquired : 28 Oct 2003 21:30 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-06 Misc Info : 10G/10ML 10/27 Vial Number: 21



File : C:\HPCHEM\2\DATA\102903F\10290321.D Operator : VPH using AcqMethod TPH1027.M Acquired : 29 Oct 2003 18:38 Instrument : FID-1 Sample Name: 310136-07 RR 2X Misc Info : 10G/10ML 10/27 500UL/1ML Vial Number: 18



File : C:\HPCHEM\2\DATA\102803F\10280332.D Operator : VPH using AcqMethod TPH1027.M Acquired : 29 Oct 2003 2:14Instrument : FID-1 Sample Name: 310136-08 10X Misc Info : 10G/10ML 10/27 100UL/1ML Vial Number: 31



File : C:\HPCHEM\2\DATA\102803F\10280323.D Operator : VPH Acquired : 28 Oct 2003 21:58 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-09 Misc Info : 10G/10ML 10/27 Vial Number: 22



File : C:\HPCHEM\2\DATA\102803F\10280324.D Operator : VPH Acquired : 28 Oct 2003 22:27 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-10 Misc Info : 10G/10ML 10/27 Vial Number: 23



File : C:\HPCHEM\2\DATA\102803F\10280325.D
Operator : VPH
Acquired : 28 Oct 2003 22:55 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310136-11
Misc Info : 10G/10ML 10/27
Vial Number: 24



File	:	C:\HPCHEM\2\DATA\102803F\10280326.D		
Operator	:	VPH		
Acquired	:	28 Oct 2003 23:23 using AcqMethod TPH1027.M		
Instrument	:	FID-1		
Sample Name	:	310136-12		
Misc Info	:	10G/10ML 10/27		
Vial Number	:	25		



File : C:\HPCHEM\2\DATA\102903F\10290323.D Operator : VPH Acquired : 29 Oct 2003 19:35 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-13 Misc Info : 10G/10ML 10/28 Vial Number: 19



File : C:\HPCHEM\2\DATA\103003F\10300306.D Operator : VPH Acquired : 30 Oct 2003 10:59 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-14 Misc Info : 10G/10ML 10/28 Vial Number: 5



File : C:\HPCHEM\2\DATA\102903F\10290339.D
Operator : VPH
Acquired : 30 Oct 2003 3:05 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310136-15 20X
Misc Info : 10G/10ML 10/28 150UL/1ML
Vial Number: 33



File : C:\HPCHEM\2\DATA\102903F\10290325.D Operator : VPH Acquired : 29 Oct 2003 20:31 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-16 Misc Info : 10G/10ML 10/28 Vial Number: 21



File : C:\HPCHEM\2\DATA\102903F\10290326.D Operator VPH : Acquired 29 Oct 2003 20:59 using AcqMethod TPH1027.M : Instrument : FID-1 Sample Name: 310136-17 Misc Info : 10G/10ML 10/28 Vial Number: 22



File : C:\HPCHEM\2\DATA\102903F\10290330.D Operator : VPH Acquired : 29 Oct 2003 22:52 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-18 Misc Info : 10G/10ML 10/28 Vial Number: 26



File :	C:\HPCHEM\2\DATA\103003F\10300320.D		
Operator :	: VPH		
Acquired :	: 30 Oct 2003 17:33 using AcqMethod TPH1027.M		
Instrument :	: FID-1		
Sample Name:	: 310136-19		
Misc Info :	: 10G/10ML 10/28		
Vial Number:	: 14		



File : C:\HPCHEM\2\DATA\102903F\10290336.D Operator : VPH Acquired : 30 Oct 2003 1:40 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-20 10X Misc Info : 10G/10ML 10/28 100UL/1ML Vial Number: 31



File : C:\HPCHEM\2\DATA\102903F\10290332.D
Operator : VPH
Acquired : 29 Oct 2003 23:48 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310136-21
Misc Info : 10G/10ML 10/28
Vial Number: 28



File : C:\HPCHEM\2\DATA\103003F\10300317.D
Operator : VPH
Acquired : 30 Oct 2003 16:09 using AcqMethod TPH1027.M
Instrument : FID-1
Sample Name: 310136-22
Misc Info : 10G/10ML 10/28
Vial Number: 13



File : C:\HPCHEM\2\DATA\103003F\10300313.D Operator : VPH Acquired : 30 Oct 2003 14:16 using AcqMethod TPH1027.M Instrument : FID-1 Sample Name: 310136-23 10X Misc Info : 10G/10ML 10/28 100UL/1ML Vial Number: 10



# ATTACHMENT J

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## Attachment J Wellhead Protection Area Map

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Map source: NM RGIS website.

0 500 1,	000 2,000 Feet
1:1	14,961
Wellhead	Protection Area
Phase I Investigation and Remediation Araho, Inc., Former Injection Well Disposal Facility Lea County, New Mexico	
Projection: UTM NAD83	Zone 13 meters
Date: 12/17/03	Attachment to Remediation Report
	0 500 1, 1: Wellhead Phase I Investig Araho, Inc., Former Ir Lea Cou Projection: UTM NAD83 Date: 12/17/03

ATTACHMENT K

Attachment K Estimated Area of Petroleum-Contaminated Soil



File: O:\E&S\OCD - Araho Facility\GIS\maps\digHaulcalc.mxd

Scope of Work and Cost Proposal

RECEIVED

APR 2 9 2003 Environmental Bureau Oil Conservation Division

# PHASE I INVESTIGATION AND REMEDIATION

ARAHO INC. Former Injection Well Disposal Facility, Lea County, New Mexico



Submitted to:

State of New Mexico Energy, Minerals & Natural Resources Department New Mexico Oil Conservation Division

Submitted by:



INTERA Incorporated One Park Square, 6501 Americas Parkway NE, Suite 820 Albuquerque, New Mexico 87110

April 30, 2003

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#### **1.0 INTRODUCTION**

This scope of work (SOW) and cost estimate are being submitted for a Phase I investigation and cleanup event at the Araho, Inc. former injection well disposal facility (Site) in Lea County, New Mexico. The cleanup is to include removal of the tank fluids, tanks, equipment, piping, and trash (present on the ground surface of the Site). This submittal is in response to an e-mailed SOW dated April 4, 2003, from Ms. Martyne J. Keiling of the New Mexico Oil Conservation Division (NMOCD) to Ms. Stacy Sabol of INTERA Inc. (INTERA).

Basing our assumptions on the SOW, INTERA has identified the following activities that will be performed during the investigation:

- Contact One-Call (New Mexico underground utility locating service) and map the buried pipelines and electrical hazards on the Site based upon the One-Call service markings;
- Perform a naturally occurring radioactive materials (NORM) survey of all pipes and equipment prior to disposal. A registered NORM surveyor must perform the NORM surveys;
- Remove material within the tanks for recycling, approximately 1,600 barrels (bbl);
- Remove the tanks for recycling or disposal;
- Remove trash at the Site to include barrels, buckets, batteries, pipes (buried and surface), electrical meters, and other trash items;
- Investigate the nature and extent of contamination beneath the tank footprints by trenching with a backhoe;
- Investigate the extent of chloride contamination in the surface soils at the Site (per the SOW, 10 6-inch compost samples will be taken);
- Provide an estimate for the volume and cost to remove the contaminated soil material (based on the results of the trenching and sample analysis);
- Provide an estimate for the volume and cost to excavate and construct compost piles on the Site (according to SOW specifications);
- Propose any additional remediation techniques which would be cost effective (based on Phase I findings); and
- Prepare a final report.

These activities are described in greater detail in Section 2.0.

#### **Background Information**

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According to the SOW, Araho, Inc. operated from 1974 to 1993 as an injection well disposal facility. The Site is located in the NE quarter of the SE quarter of Section 1, Township 17 South,

Phase I Investigation and Remediation 04/29/03



Range 36 East, Lea County, New Mexico. The surface is owned by the City of Lovington. The NMOCD is in the process of obtaining an access agreement with the City of Lovington in order for contract work to be performed. The facility has a large, lined waste holding pit. This pit is not included in the NMOCD Phase I investigation and cleanup. However, Navajo refining and their contractor will be managing the cleanup of the pit portion of the facility. The two portions of the project may be occurring at the same time or they may be staggered.

Depth to ground water at the Site is estimated to be approximately 80 feet. The local ground water gradient is estimated to be toward the southeast. The NMOCD has provided the following table which lists the major items at the Site and the estimated volume.

ITEM	SIZE / VOLUME ESTIMATES
Facility Dimensions	293' x 410'
Lined Pit 125' x 120' x 4'	Not included in this estimate
Outside Pit Berm 145' x 145' x 4'	Not included in this estimate
3,000-bbl tank	1,000 bbls of material
210-bbl tank	50 bbls of material
750-bbl tank	250 bbls of material
500-bbl tank	empty
500-bbl tank	100 bbls of material
200-bbl tank open top fiberglass	200 bbls and overflowing
200-bbl tank	empty
750-bbl tank	empty
pipe	1,000 feet
55-gallon drum	15 drums
Assorted trash	volume not assessed

INTERA visited the Araho Facility on April 11, 2003, in order to adequately prepare this cost estimate (please see the attached photo log). INTERA met general contractors and NORM surveyors at the facility and provided a walking tour of the facility. Areas of soil staining were identified near valves and piping connections. A leak detection sump was identified to the immediate east of the line pit. According to the NMOCD, this sump will be removed during the remediation of the lined pit, to be conducted by Navajo Refining (the Navajo Refining remediation may or may not be occurring at the same time as the NMOCD project).

#### 2.0 SCOPE OF WORK

Based on the SOW requirements provided by the NMOCD, INTERA has developed the project SOW by dividing the activities into five distinct tasks. Task 1 will include project development

Araho, Inc. Scope of Work Lea County, New Mexico



and coordination. Task 2 will consist of contacting One-Call (map the underground pipelines) and conducting a NORM survey of all pipes, tanks, and other equipment prior to disposal. Task 3 will incorporate the field activities of removal of the materials within the tanks and removal of the tanks and other "trash" from the Site (trash includes barrels, buckets, batteries, above- and below-ground pipes, electrical meters, and other miscellaneous items), and also will include the investigation of the nature and extent of contamination below the tank footprints. Task 4 will include the investigation of the extent of chloride contamination in the surface soils using a grid coordinate system. Task 5 will involve the preparation and transmittal of a summary report to the NMOCD.

#### 2.1 Task 1: Project Development and Coordination

A Phase I investigation and remediation event of the magnitude proposed requires adequate preparation and coordination. Task 1 will include the development of a project schedule, project budget tracking, preparation of a health and safety plan, and the preparation of an internal work plan. Task 1 will also include project management tasks and coordination with the NMOCD.

#### 2.2 Task 2: Performance of a "One-Call" and a NORM Survey

INTERA will perform a New Mexico-required "One-Call" contact prior to the performance of any site work. The "One-Call" service should provide the locations of all known underground buried utilities at the Site. In addition, an NMOCD-provided map of the underground piping present at the Site will also be used to ultimately produce a Site utility location map. This map will be used during the trenching work to avoid buried utility lines and to document all known electrical hazards on the Site. A copy of the Site utility location map will be included in the final report.

INTERA will subcontract to perform a NORM survey. INTERA has contacted the New Mexico Environment Department Radiation Control Bureau and obtained a list of qualified NORM surveyors. INTERA will use a NORM surveyor located nearest the Site to reduce mobilization/transportation/per diem costs. The NORM survey will determine if there are any radioactive materials present in the tanks, piping, or other trash to be disposed of. NORM can accumulate in piping bends and/or elbows and tank bases, where petroleum products can accumulate and harden on interior surfaces.

According to NMOCD, the presence of NORM in any tanks would not prohibit the tanks from being transported off site for recycling. A complete copy of the NORM survey results will be included in the final report.

#### 2.3 Task 3: Field Investigation

The field investigation will include those activities described in the NMOCD SOW, and will include:

• An INTERA licensed subcontractor will remove all of the fluids from the tanks located at the Site and will dispose of them accordingly. (This does not include the leak detection sump, which is included in the Navajo Refinery remediation associated with the lined pit


located at the Site.) The material will be recycled if possible. INTERA will record the volume of material disposed of and the company used for disposal/recycling, which shall be NMOCD-approved. The volume of recoverable hydrocarbons will be documented as well.

- An INTERA licensed subcontractor will clean the tanks located on the Site prior to shearing (cutting) the metal for disposal using water jetting. The wash water will be disposed of with the other fluids currently located in the tanks at the Site.
- INTERA and its licensed subcontractor will conduct the health and safety monitoring of ambient air and of air within each tank during removal and demolition. The removed tanks will be disposed/recycled at an NMOCD-approved facility.
- An INTERA licensed subcontractor will conduct the removal of the miscellaneous debris located at the Site (barrels, buckets, buried and surface piping, electrical meters, and other trash items). The perimeter fencing located around the facility is to remain in place and is not considered part of the miscellaneous debris recommended for disposal. INTERA will document the volume/weight of the miscellaneous debris removed at the disposal/recycling company used.
- All testing necessary (which has been assumed to be limited to the NORM survey and the lead-based paint [LBP] survey conducted by NMOCD at the facility) will be conducted prior to the disposal of the metal materials. The paint on the tanks has been sampled for lead content by NMOCD and these results will be provided to the contractor prior to the initiation of fieldwork. A significant amount of LBP will affect the disposal costs and be considered a change in scope and thus a change in costs. INTERA assumes that no further waste characterization (Resource Conservation and Recovery Act [RCRA] requirements) will have to be conducted for waste at the Araho Facility.
- INTERA will investigate the nature and extent of contamination below the tank footprints using trenching, with each trench constructed with a backhoe. Trenches will be constructed along the diameter of each tank as well as in any "stained" soil areas formerly under or around a given tank. Grab soil samples will be retrieved from each trench and INTERA will screen the soil samples via New Mexico Petroleum Storage Tank Bureau headspace screening methods. The photoionization detector readings will be recorded in the field log book. The soil samples selected for laboratory analysis will be submitted to an NMOCD-approved laboratory (either Trace Analysis or Pinnacle Laboratories) at the discretion of the NMOCD project manager. INTERA will not be responsible for sample shipping or analytical costs. In addition, NMOCD agrees to provide INTERA with complete copies of all laboratory analytical results to be included in the final report. Per the NMOCD SOW, each soil sample submitted will be analyzed for total petroleum hydrocarbons, benzene, toluene, ethyl benzene, and total xylenes, and chloride.
- INTERA will investigate the extent of chloride contamination in the surface soils at the Site by constructing a grid as required by the NMOCD SOW. From the grid, INTERA will collect 10 6-inch "compost" (i.e., composite) samples and submit them for chloride analysis. The chloride soil samples will be sent to the laboratory of the NMOCD project manager's choice. INTERA will not be responsible for chloride sample analytical or shipping costs; these costs will be incurred directly by NMOCD.

Phase I Investigation and Remediation 04/29/03



- All sample locations will be documented using a hand-held GPS receiver and will be provided in the coordinate system specified by the NMOCD Project Manager. The GPS locations will be used to document sampling locations on the final site figures.
- INTERA recommends that quality control/quality assurance (QA/QC) samples (split samples, duplicates, etc.) be collected. The frequency and number of QA/QC samples will be dictated by the NMOCD, and therefore have not been budgeted at this time.

#### 2.4 Task 4: Preparation of an Investigation Report

Upon the culmination of the field investigation, INTERA will complete a report documenting results of the investigation and summarizing the collected data. The report will include at a minimum:

- A site map showing all buried pipelines, electrical hazards, Site boundaries, and sampling locations;
- NORM survey results;
- The volume of material removed from the tanks, disposal/reclamation company used and the volume of recoverable hydrocarbons retrieved;
- Tank reclamation or scrap iron facility used;
- Volume/weight of miscellaneous debris removed and the disposal/recycling company used;
- Results of all analytical data gathered;
- A map/cross section showing the locations, depths, and concentrations of remaining soil contamination areas;
- Estimates of the volume and cost to remove all material determined to be contaminated based on the trenching and sample analysis. An estimate for the cost of placing clean fill in the excavated areas will also be generated. INTERA will follow the NMOCD suggestion to transport clean fill from a landfarm location to help decrease transportation charges; and
- Estimates of the volume and cost to excavate and construct compost piles on site. The contaminated material should be mixed at a 4:1 ratio with manure and enough water to keep the piles moist, per the NMOCD request. The piles are to be turned every four weeks for at least four turning events. Estimates will include costs to backfill and compact the excavations and contour the Site with the remediated compost material.

#### 2.5 Task 5: Preparation of a Summary Report

Task 5 will involve the preparation and transmittal of a summary report to the NMOCD. Per the NMOCD SOW, the final report will include:

- A site map showing all buried pipelines and electrical hazards;
- NORM survey results;
- Volume of material removed from the tanks (combined); disposal/reclamation company used and the volume of recoverable hydrocarbons retrieved;
- Tank reclamation or scrap iron facility used;
- Volume/weight of trash removed and the disposal/recycling company used;

Araho, Inc. Scope of Work Lea County, New Mexico Phase I Investigation and Remediation



- Results of all analytical data gathered;
- A map/cross section showing the locations, depths, and soil contamination areas identified; and
- Phase II remediation techniques/proposals with estimates for further work as outlined in the SOW.

#### 3.0 SCHEDULE

INTERA will begin scheduling and project coordination as soon as possible after the NMOCD has issued a purchase document for the investigation.

The investigation report will be transmitted to the NMOCD within 60 days of completion of the field sampling activities.

### 4.0 **PROPOSAL**

The cost estimate is provided in the attached spreadsheet. INTERA's services will be provided on a time and materials basis. INTERA will not exceed these costs without first requesting and then obtaining approval for an amendment to this budget. Assumptions used in developing these costs are provided below.

- A NORM Survey needs to be conducted on the sludge material located on the bottom surface of the 3,000-barrel tank. All material will be pumped from this tank prior to sampling the sludge on the bottom. The NORM Survey will also include surveying all tanks and miscellaneous debris transported from the Site.
- NMOCD will provide the results of the LBP sampling to INTERA prior to commencement of the field investigation/remediation.
- The NMOCD will grant access to the property and INTERA need not obtain or generate any access agreements.
- INTERA will complete the fieldwork for the site remediation/site characterization within a period of 50 hours.
- The fencing around the perimeter of the facility does not need to be removed and will not be included as material characterized in the NORM Survey.
- No confined space entry is required during the completion of the field activities.
- Soil samples will be sent to an NMOCD contract laboratory. Because the contract laboratory will be reimbursed directly through the State of New Mexico, costs for laboratory analyses are not included in the attached estimate. The selected laboratory will provide all sample bottles, coolers, etc. and will be responsible for any cost incurred by INTERA for sample shipping.
- The NORM survey and LBP sampling are the only samples required of material for disposal. RCRA sampling requirements for disposal of certain materials (i.e., batteries, drums with nonpetroleum contents, etc.) have not been included as part of this cost estimate.
- INTERA assumes that the barrels at the facility are empty.

• Laboratory analytical data will be forwarded to INTERA within 21 calendar days of submittal of samples to the laboratory.

INTERA will submit one invoice for services upon transmittal of the investigation report. Terms of payment will be in accordance with INTERA's New Mexico General Services Department Contract No. 30-805-09-18056.

### 5.0 PERSONNEL

The key personnel who will be responsible for completion of the project are listed below along with their areas of responsibility.

Ms. Stacy Sabol – Principal	Client interface, oversight of project management, and technical review of work plan and report documents.
Mr. Joseph J. Tracy, PG – Project Geologist	Project management, contaminant investigation activities, and development of work plan, health and safety plan, and final report.
Mr. James P. Joseph – Project Engineer	Project management, contaminant investigation activities, and development of work plan, health and safety plan, and final report.
Mr. Jerome Marez – Staff Engineer	Background research, site investigation activities, and development of work plan, and final report.
Mr. Konrad Clark – Field Technician II	Coordination, scheduling, and lead technician on field activities. Completion of field forms and final report development.

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#### State of New Mexico **Oll Conservation Division** Phase I Investigation and Remediation Araho, Inc. Former Injection Well Disposal Facility, Lea County, New Mexico Cost Estimate

Task 1. Project C	oordination a	nd Fieldwor	rk Preparatio	n		
	Contract Line					
Professional Services	Item	Rate	Unit	# of Units	Total	202.00
Principal	0001	100,00	hour	2	5	200.00
Project Scientist/Engineer/Manager	0003	\$2.00	hour	4	5	208.00
Field Technician II	0005	50.00	hour	8	S	400.00
Subtotal Professional Labor					5	1,076.00
SUBTOTAL TASK 1:					5	1,076.00
NMGRT @ 5.8125%					5	62.54
GRAND TOTAL TASK I:					5	1,138.54
Task 2. Map Buried Utilities (1-Call) and Per	form Natural	lly Occurrit	ng Radioactiv	e Materials (	(NORM) Survey	
	Contract Line		W1-16	A CONTRACTOR	Titel	
Professional Services	Item	S2.00	Last	# of Units	C Lotai	104.00
Statt Scientist Engineer Field Technician II - Mobilization	0005	50.00	hour	16	\$	800.00
Field Technician II	0005	50.00	hour	8	S	400.00
Draftsperson II (Utility Mapping)	0007	50.00	hour	8	\$	400.00
Subtotal Professional Labor		_			5	1,704.00
	Contract Line			1000		
Expenses	Item	Rate	Unit	# of Units	Total	1.300.00
NORM Survey	"At Cost"	1,300.00	each	1	5	1,300.00
Subtotal Expenses			_		3	1,300,00
SUBTOTAL TASK 2: NMCRT @ \$8125%					5	174.61
GRAND TOTAL TASK 2:					s	3.178.61
Task 3. Field Investigation: Tank Removal/Clea	ning/Disposa	and Piping	Removal/D	isposal and S	ampling/Trenchin	g
The of the internation the second second	Contract Line					
Professional Services	Item	Rate	Unit	# of Units	Total	
Project Scientist/Engineer/Manager	0003	67.00	hour	6	\$	402.00
Staff Scientist/Engineer	0004	52.00	hour	8	\$	416.00
Field Technician II - Fieldwork*	0005	50.00	hour	50	S	2,500.00
Field Technician II - Foreman	0005	50.00	hour	50	5	2,500.00
Field Technician I - Equipment Operator Trackhoe	0006	35.00	hour	50	5	1,750.00
Field Technician I - Laborer	0006	20.00	hour	50	s	1,000.00
Field Technician I - Laborer	0006	20.00	bour	50	S	1,000.00
Hourly Secretary	0010	30.00	hour	4	\$	120.00
Subtotal Professional Labor		_			s	10,938.00
	Contract Line				1 22 1	
Expenses	Item	Rate	Unit	# of Units	Total	10.180.00
Disposal of Contaminated Fluids (Product) Disposal of Contaminated Fluids (Cleaning Water)	0044	7.85	barrel	360	5	2 826 00
Vacuum/Jet Truck	"At Cost"	750.00	day	4	s	3,000.00
Trackhoe Heavy Duty	0030	646.00	day	5	\$	3,230.00
Disposal of Scrap Metals (Tanks) and Piping	"At Cost"	40.00	ton	12	\$	480.00
Disposal of Miscellaneous Trash	"At Cost"	35.00	ton	48	\$	1,680.00
		110000				
Transportation of Materials (Scrap Metals, Piping, Trash) for Disposal	"At Cost"	19.50	ton	60	5	1,170,00
Backhoe Medium Duty Combustible Cas Indicator (CGD with 02, H2S, CO2	0026	\$0.00	day	2	5	250.00
Fresh Air/Safety Trailer/Personal Air Samplers	"At Cost"	300.00	day	3	\$	900.00
Hand-Held GPS Unit	"At Cost"	5.00	day	3	\$	15.00
Photoionization Detector (PID)	0021	10.00	day	5	5	50,00
Mileage	0042	0.25	mile	800	\$	200.00
Per Diem	0043	65.00	day	7	\$	455.00
Subtotal Expenses					5	25,521.00
SUBTOTAL TASK 3 NMGRT @ 5.5125%						36,459,00
GRAND TOTAL TASK 3:	Deserve	for Flands	lines			38,878,18
Task 4.	reparation o	an rinal f	ceport			
Perfectional Services	Contract Line	Rete	Tale	# of Units	Tetal	
Principal	0001	100.00	hour	8	S	800.00
Project Scientist/Engineer/Manager	0003	67.00	hour	24	\$	1,608.00
Staff Scientist/Engineer	0004	52,00	hour	40	5	2,080.00
Field Technician II	0005	50.00	hour	.24	S	1,200.00
Draftsperson II (Figures, Cross Sections)	0007	50.00	hour	16	\$	800.00
Administrator (Technical Editor)	0009	40.00	hour	6	5	6 738 00
Subtotal Professional Labor			-		5	0,728,00
NMGRT @ 5.8125%					5	391.07
GRAND TOTAL TASK 4:					s	7,119.07
AND OT TO FOR OWN A NOT THE PARTY A			-	_		0.01.1.20
PROJECT GRAND TOTAL:					5	50,014.39

Notes:

Notes: NMGRT = New Mexico Gross Receipts Tax * The labor rate shown for "Field Technician II - Fieldwork" is provided on the assumption that a maximum of 50 hours of fieldwork will be required to complete the tank and piping removal and disposal portion of the project. This time estimate also includes sample trenching and sample collection; however, sample analytical costs are not included in this cost estimate. All INTERA costs will be invoiced on a time and materials basis; therefore a reduction of time or materials taken to complete the project results in a reduction of the final costs of the project.



### PHOTO LOG



No. 1 – View of the empty tanks located to the northeast of the lined pit.



No. 2 – View of the 750 and 3,000 barrel tanks located at the Araho Facility.



Former Injection Well Disposal Facility Lea County, New Mexico



No. 3 – Concrete slab and former wooden floor located adjacent to the 3,000 barrel tank.



No. 4 – Typical view of product lines connected to aboveground tanks.





No. 5 – Areas of soil staining located adjacent to the 750 and 3,000 barrel tanks.



No. 6 - View of tanks, electrical lines, and surface soil staining.





No. 7 – View of the lined pit and sump.



No. 8 – 200 barrel tank with product that has overflowed on to the surrounding ground surface.





No. 9 – View of miscellaneous debris and surface soil staining adjacent to the 200 barrel tank.



No. 10 – View of the site showing tanks, electrical lines, and above ground piping.



# Navajo Refining Company Arahoe Pit Assessment Section 1 Township 17 S Range 36 E Lea County, New Mexico

**October 5, 2000** 





### **Prepared For:**

Navajo Refining Company 501 East Main Artesia, New Mexico 88210 (505) 748-3311

**Prepared By:** 

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

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#### I. Background

Safety & Environmental Solutions, Inc. (SESI) was engaged on April 27, 1999 to perform a site investigation of the Arahoe Pit located in Section 1 Township 17S, Range 36E, Lea County, New Mexico (Figure 1). The scope of work for this investigation includes drilling two (2) bore holes to groundwater, one located northwest of the pit and one located southeast of the pit. No soil samples will be taken from surface to the groundwater in either borehole. One groundwater sample from each borehole will be taken and analyzed for TPH and BTEX by a third party laboratory. The boreholes will be grouted and backfilled with cuttings after the sampling is complete. In addition, three (3) boreholes will be drilled on each side of the pit to the bedrock and a single soil sample taken at that point.

#### II. Work Performed

SESI performed the drilling and sampling services for this project on October 5, 2000. Cardinal Laboratories of Hobbs, New Mexico was contracted to perform the laboratory analytical testing required for this project. SESI used a hollow stem auger rig for the drilling and a thin wall sampling tube for the extraction of the samples.

Twelve (12) test borings were drilled at even intervals around the pit, as close to the berm as possible, to the first encounter of bedrock. (Figure 2) Samples were taken from the bottom of each borehole at the top of the bedrock and screened with a Photovac Microtip PID, serial number 1128, calibrated on October 5, 2000. The results of the screening are as follows:

SAMPLE ID	DEPTH	PPM
Borehole # 1	5 ½ ft	11.3
Borehole # 2	5 ft	17.4
Borehole # 3	3 ½ ft	16.2
Borehole # 4	3 ft	8.3
Borehole # 5	3 ft	15.9
Borehole # 6	3 ft	11.3
Borehole # 7	4 ft	10.9
Borehole # 8	4 ½ ft	6.3
Borehole # 9	4 ft	8.0
Borehole # 10	4 ft	9.3
Borehole # 11	4 ft	9.5
Borehole # 12	5 ft	10.8

Site Assessment	Navajo Refining Co.
Arahoe Pit Site	October 5, 2000

In addition, two (2) boreholes were drilled to the groundwater. The first groundwater test was drilled to the northwest of the pit and the second groundwater test was drilled to the southeast of the pit. Both test borings were approximately 20' from the edge of the berm surrounding the pit. (Figure 2)

A groundwater sample was taken from each test boring and sent under chain of custody to Cardinal Laboratories for Total Petroleum Hydrocarbons (TPH) and Benzene, Toluene, Ethyl Benzene and Xylene (BTEX). (Appendix A) The results of the laboratory analysis are as follows:

SAMPLE	TPH	BENZENE	TOLUENE	ETHYL	XYLENE
				BENZENE	
W-1 NW	< 1.0ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.006ppm
W-2 SE	<1.0ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.006ppm

#### IV. Summary

This site investigation has revealed no hydrocarbon contamination present in the groundwater to the northwest and southeast of the subject pit. In addition, there was no contamination identified on the top of the bedrock in any direction from the subject pit.

#### V. Figures and Appendix:

#### **Figures:**

Figure 1 - Vicinity Map Figure 2 - Site Plan

#### Appendix:

Appendix A - Analytical Results

#### Kieling, Martyne

From: David Boyer [dgboyer@sesi-nm.com]

Sent: Friday, October 31, 2003 7:26 AM

To: mkieling@state.nm.us

Subject: Arahoe Pit

Martyne,

Checked our files for that project and found that two boreholes were completed as temporary monitor wells, one on the northwest corner and one on the southeast corner. W-1 on the NW corner had a TD of 83 ft. with the top of water at 74 ft. W-2 on the SE corner had a TD of 80 ft. also with the top of water at 74 ft. There was no log with this information, although notes indicated a bentonite and grout seal was placed following sampling of the ground water. Bob was in the area yesterday at the time we talked and went by the site; he confirms that there are no current monitor wells at the site.

I will be in the area this morning myself; let me know if you need any other info.

Dave Boyer

Site Assessment Arahoe Pit Site

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Navajo Refining Co. October 5, 2000

# Figure 1 Vicinity Map



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Site Assessment Arahoe Pit Site

Navajo Refining Co. October 5, 2000

# Figure 2 Site Plan





Site Assessment <u>Arahoe Pit Site</u>

Navajo Refining Co. October 5, 2000

# Appendix A Analytical Results



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DEE WHATLEY 703 E. CLINTON, STE. #103 HOBBS, NM 88240 FAX TO: (505) 397-4388

Receiving Date: 10/05/00 Reporting Date: 10/06/00 Project Number: NOT GIVEN Project Name: ARAHOE PIT Project Location: LOVINGTON, NM Sampling Date: 10/05/00 Sample Type: GROUNDWATER Sample Condition: COOL & INTACT Sample Received By: BC Analyzed By: GP/BC

LAB NO.	SAMPLE ID	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	BENZENE (mg/L)	XYLENES (mg/L)
ANALYSIS	DATE:	10/06/00	10/05/00	10/05/00	10/05/00	10/05/00
H5238-1	SOUTHWEST	<1.0	<0.002	<0.002	<0.002	<0.006
H5238-2	NORTHWEST	<1.0	<0.002	<0.002	<0.002	<0.006
Quality Cor		125	0.093	0.104	0 103	0.310
True Volue		12.0	0.095	0.104	0.100	0.000
The value		12.0	0.100	0.100	0.100	0.300
% Recover	у	104	93.1	104	103	103
Relative Pe	ercent Difference	11.6	6.3	0.2	0.7	1.2

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA 624/SW-846 8260

floshe

0/6/00

Date

#### H5238.XLS

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

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STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

## MEMORANDUM OF MEETING OR CONVERSATION

TelephonePersonal E.Mail	Time 10:00 Date 5-24-06
Originating Party Murtyre Kiel	Other Parties Melissa Smith EPA
Subject Araho Inc.	
Discussion Sent Email	Copy of May 24th 2000 letter
Conclusions or Agreements	
Distribution	Signed

## STATE OF NEW MEXICO ENERGY MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

## MEMORANDUM OF MEETING OR CONVERSATION

Time 9:30 Date 5-5-00 Telephone Personal **Originating Party** Other Parties Maryne Kicling nork Canchez A+ men Fur Aralas Subject Amarho . Discussion Corporation Going into liquidention Lyn Hebert Phone North and left File with Gave -un Conclusions or Agreements Signed Muty Distribution