

State of Colorado
Oil and Gas Conservation Commission



1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:
 Spill Complaint
 Inspection NOAV
 Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): Production Pit Closure

OGCC Operator Number: <u>96850</u>	Contact Name and Telephone: <u>Jason D. Rauen</u>
Name of Operator: <u>Williams Production RMT Company</u>	No: <u>970.274.4564</u>
Address: <u>1058 County Road 215</u>	Fax: <u>970.263.5313</u>
City: <u>Parachute</u> State: <u>CO</u> Zip: <u>81635</u>	

API Number: _____	County: <u>Garfield</u>
Facility Name: <u>TR 31-21-597</u>	Facility Number: <u>284696</u>
Well Name: _____	Well Number: _____
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWNE Sec 21, T5S, R97W, 6th PM</u> Latitude: <u>39.602676</u> Longitude: <u>-108.282234</u>	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Produced water

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Non-crop rangeland, non-irrigated

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Parachute-Irigul, 5 to 30% slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): There are no permitted water wells within 1/4 mi.; Pearl Creek lies approx. 640 ft. to the east

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>See attached for description of lateral and vertical extent</u>	<u>Field screen, visual assessment and lab confirmation samples/results</u>
<input type="checkbox"/> Vegetation	_____	_____
<input type="checkbox"/> Groundwater	_____	_____
<input type="checkbox"/> Surface Water	_____	_____

REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):
See attached, Notice of Completion Report for Remediation #4938.

Describe how source is to be removed:
See attached, Notice of Completion Report for Remediation #4938.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:
See attached, Notice of Completion Report for Remediation #4938.



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

See attached, Notice of Completion Report for Remediation #4938.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

See attached, Notice of Completion Report for Remediation #4938.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? Y N If yes, describe:

See attached, Notice of Completion Report for Remediation #4938.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

See attached, Notice of Completion Report for Remediation #4938.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: July 5, 2010 Date Site Investigation Completed: July 27, 2010 Date Remediation Plan Submitted: February 17, 2010
Remediation Start Date: July 21, 2010 Anticipated Completion Date: July 28, 2010 Actual Completion Date: July 30, 2010

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Jason D. Rauon Signed: Jason Rauon
Title: Environmental Specialist II Date: July 30, 2010

OGCC Approved: _____ Title: _____ Date: _____

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
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Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Form 27 Attachment

Introduction

The purpose of this Notice of Completion report – for the closure of the TR 31-21-597 production pit (COGCC facility number 284696; hereinafter also referred to as TR 32-21-597) – is to provide detailed information and findings analysis for the previously submitted and approved (remediation number 4939) Colorado Oil and Gas Conservation Commission (COGCC) Site Investigation and Remediation Workplan, Form 27. This report will provide the documentation necessary to demonstrate a comprehensive and diligent investigation of the pit and adjacent environment which was obtained as described and in accordance with all appropriate county, state and federal rules and regulations.

The subject Form 27 was delivered via Certified Express Mail and electronic email on February 17, 2010. Preliminary approval to proceed with closure of the subject pit was issued by the COGCC and obtained by Williams Production RMT Company (Williams) on June 23, 2010; at which time the aforementioned remediation number was issued. Closure activities began on July 1, 2010 and were concluded on July 30, 2010. Information included in this report includes but is not limited to, field screening results, laboratory analytical, subliner soil remediation, soil disposal, liner recycling, and complete backfilling of the production pit.

Evacuation of Pit Contents

Produced water was removed from the pit using hydro-vac trucks and hauling the water to approved disposal/evaporation facilities as well as using the water for frac operations within the Piceance basin.

After produced water within the pit was removed, the pit still contained roughly 75 bbls of free standing liquid and sludge material on the bottom, mainly located in the south/southwest corner of the pit. The remaining content of the pit contained a slight sheen and was black in color. A strong hydrocarbon odor was evident from the remaining pit sludge.

Additional evacuation was required to remove the remaining pit sludge and free standing water with a hydro-vac truck and placed on location inside a bermed and lined revetment. Dry native soil was incorporated into the sludge to remove the free liquids and allow for profile sampling to Rio Blanco County landfill (refer to Appendix 5 for additional information on the sampling and profiling procedure).

Any residual pit contents remaining on the pit liner was collected and removed during pit liner removal through the use of a hydro-vac truck. All residuals collected were placed within the bermed and lined revetment pending profile and disposal with the other exploration and production (E&P) waste.

Background Sampling

Three grab samples were collected from the upgradient undisturbed hillsides surrounding the pad. Background samples were analyzed for arsenic as well as one location which included inorganic parameters of COGCC Table 910-1. Refer to Appendix 3 for background sampling results.

Pit Liner Investigation and Integrity Assessment:

The integrity of the pit liner system – containing two layers of liner and one layer of felt – was in good working condition, revealing no tears or rips below the top crest of the pit. Minor rips and tears were visible above the top crest of the pit on the west side, but pose no environmental concern. High water marks were evident roughly 3 feet below the top of the pit/surface of the pad, indicating that no overflowing had occurred (see figure 3).

The integrity of the liner on the bottom was visually inspected during the removal. Since the liner needed to be cut at the crest of the pit and pulled to a centralized location to remove residual sludge and free liquid, this made it possible to identify three small holes on the bottom of the liner.

Pit Liner Removal:

Removal of liner and felt material consisted of cutting the liner(s) at the crest of the pit and pulling the liners to one centralized location, allowing for any liquids or sludge in the pit to accumulate and be removed prior to extraction of the liner to prevent tearing or rupturing of the liner from the weight of the sludge. This process allowed for an accurate account of the condition of the subsoil's by exposing the pit foundation without unintentional communication of the pit contents with the substrate.

As crews were pulling the north end of the liner to the south, three small holes were observed in the bottom of the primary liner. The identified holes were located near the center of the pit liner, with one hole on the north end where dark staining was present within the subsoil, and two holes closer to the west side roughly 5 feet from the southwest area of concern.

- Liners were placed in a lined bermed containment pending recycling (see Appendix 4 for related recycling transport manifest).

While removing the primary liner, it was discovered that a protective layer of felt underlayment was present with a secondary liner underlying the felt layer. The presence and use of felt underlayment identifies that preventative and precautionary measures were taken during the construction of the pit liner system in order to preserve the integrity of the overall containment system. To reiterate, the pit liner system consisted of the following profile: primary liner, geotextile (felt protective underlayment), and a secondary liner.

Small pools of free liquid were present between the felt and second liner where holes were previously identified during the inspection of the primary liner. This liquid was removed and placed within the revetment on location. The additional layers of lining materials were then pulled towards the center of the pit from the four corners and removed from the pit using a trackhoe; similar process as previously described. Care was taken to ensure that liquid or sludge was not released from the liner system to the surrounding environment.

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Facility # 284696
Remediation # 4938

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Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

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Subliner Investigation and Activities:

Subliner soils, examined below the pit lining, were inspected visually and field screened using a MiniRae Lite Photoionization Gas Detector (PID) as well as a Petroflag Hydrocarbon Unit (Petroflag) to identify areas which may exceed standards set forth in Table 910-1 of the COGCC 900-series Rule for hydrocarbons within the soil. Areas of Concern (AOCs) were visually identified on the north bottom and southwest bottom of the pit and warranted additional investigation. The north area of concern contained black moist soil and a moderate to strong organic/hydrocarbon odor. The area of concern in the southwest corner contained approximately 10 gallons of free standing water. Discoloring of the soil and rock resembled rust, and contained no hydrocarbon odor. This appeared to be discoloration due to interaction of the moisture with native subsurface soil (i.e. redox reaction) as opposed to hydrocarbon staining. This rationale is supported by the fact that discoloration was drastically reduced once subsurface soils were allowed to dry (see figures 4 and 5).

Field screening of the pit footprint and walls was performed along the entire pit footprint in a grid pattern of quarter sections. The pit bottom was separated into four sections and those four sections were then separated into quarter sections, yielding 16 quarter sections on the pit floor. A similar grid pattern was followed for each of the four side walls. Below is an outline of the pit and field screen locations with the corresponding field screen result.

Figures 1 and 2 outline the field screening grid system utilized to collect field screening results. Figure 1 outlines the PID results while Figure 2 outlines PetroFlag results taken from each quarter section of the pit bottom. Due to the fact that there were no visual signs of contamination along the side walls of the pit, only PID readings were collected.

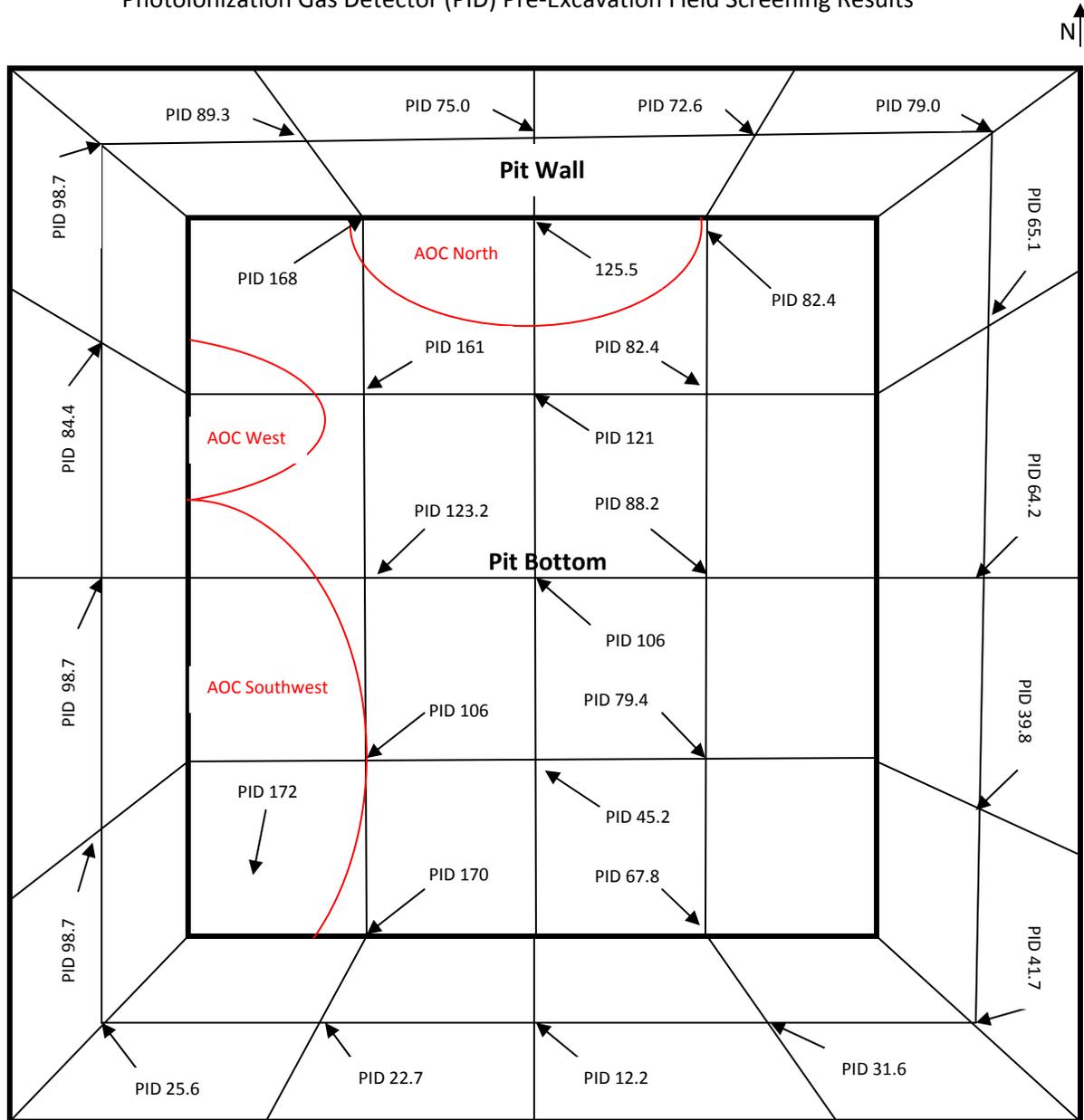
Relation of Contamination

Field screening results of the pit subsoils and side walls were conducted by following the grid pattern presented in the Williams Highlands Pit Closure Plan. The AOCs were identified by field screening results and were marked for excavation. Figure 2 illustrates the PetroFlag results where the bottom of the pit was broken into quarter sections and each of those quarter sections contained a 5 point soil composite to provide the corresponding reading.

Complete delineation of all the AOCs was accomplished through visual assessment and field screening of the excavated area to remove all potential and actual impacted soils. A combination of PID and PetroFlag field screening techniques were utilized to complete surficial and at-depth delineation of AOCs and canvass the entire pit footprint. PetroFlag readings were collected when native soil appeared to be non-impacted within the excavation to determine if soil meets COGCC guidelines and remediation of that area was complete. Table 1 shows field screening results at various depths from suspect areas and those which were later determined to exceed COGCC guidelines; requiring remediation.

Figure 1

Photoionization Gas Detector (PID) Pre-Excavation Field Screening Results



- *Red arcs indicate area of concerns
- *Results are in ppm (mg/kg)
- * AOC = Area of Concern

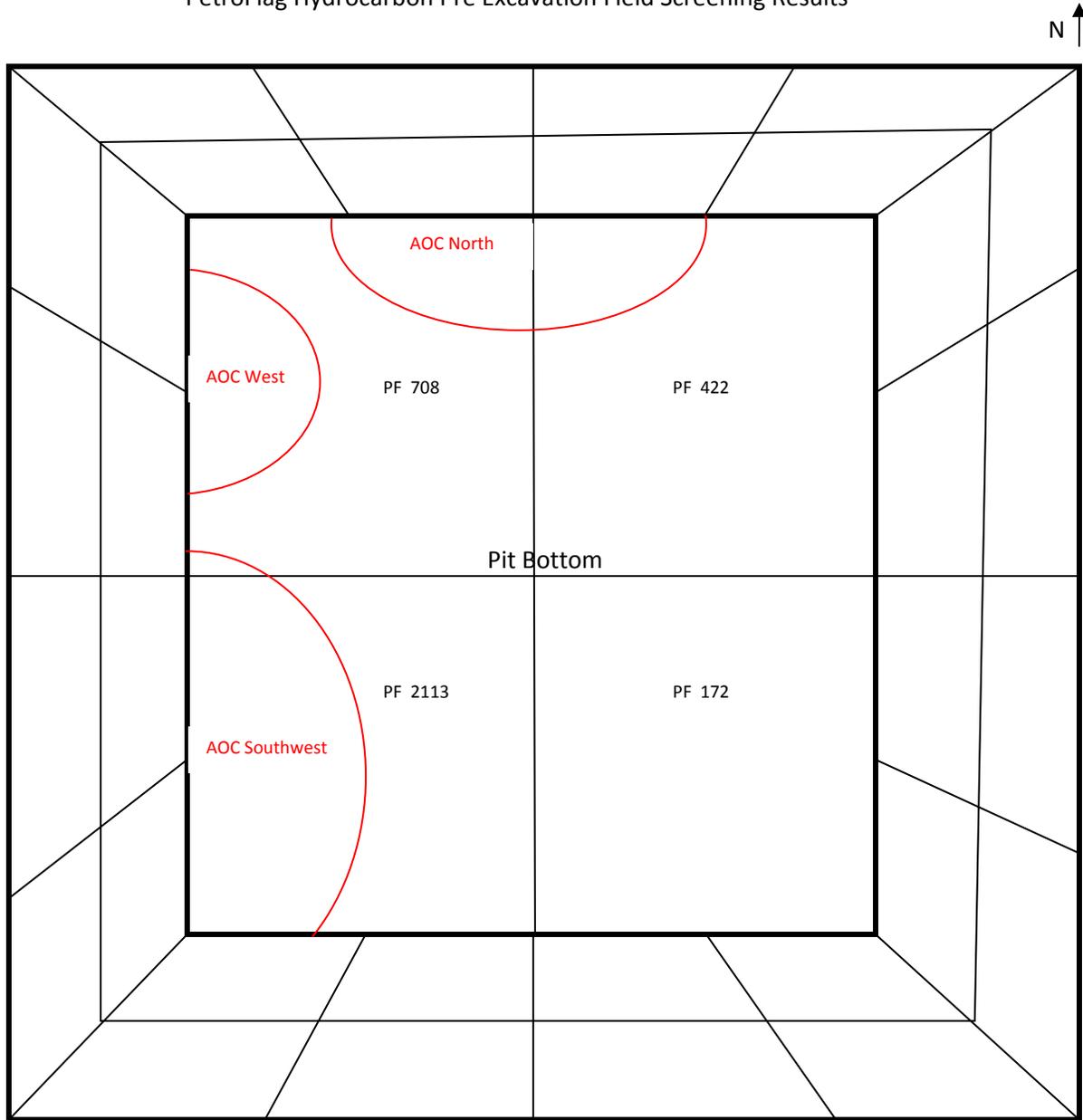
Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

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County: Garfield

Figure 2

PetroFlag Hydrocarbon Pre Excavation Field Screening Results



- *Red arcs indicate area of concerns
- *Results are in ppm (mg/kg)
- * AOC = Area of Concern

Table 1

PetroFlag Field Screening Results

	0-6"	1'	3'	4'	8'
Northeast Corner	422	-	-	-	-
Northwest Corner	708	-	-	-	-
Southeast Corner	172	-	-	-	-
Southwest Corner	2113	-	-	-	-
West Wall	-	122	-	-	-
AOC North	-	1751	-	313	-
AOC Southwest	-	-	-	1315	403
West Bottom	-	3672	176	-	-

All results are in ppm (mg/kg)

Petroflag analysis was collected from compositing the five PID locations within each bottom quarter section. Because PID analysis on the walls are below 100 ppm, Petroflag sampling was not collected. Hydrocarbon concentrations would be displayed from laboratory analysis when results are received. Areas containing an elevated PID reading were additionally field screened with a PetroFlag analysis to determine the concentration of contaminant within the soil.

- Confirmation sample(s), Rule 905.b.(4), were collected from each of the side walls half way down the side and half way between the two adjacent side walls for confirmation of compliance within COGCC Rule 910 and Table 910-1; verification of field screening analysis. Grab samples were collected from the base of the pit as well to demonstrate compliance in accordance with Rule 905.b.(1).
- A Trimble Geo XT 2008 was used to collect GPS locations of each field screen location as well as confirmation sample locations from the pit walls, and pit footprint.
- Visual inspection of the pit bottoms, field screening techniques, and sampling procedures were followed in accordance with Williams Highlands Pit Closure Plan (COGCC document #01175818).

Remediation Activities

Stained soils and areas of concern identified during the subsoil investigation were excavated and placed in a lined bermed containment to be profiled for disposal (see Appendix 4). Field screening and analytical results indicated that soil within the area of concerns and the west wall exceeded the COGCC Table 910-1 standard for TEPH (DRO) and required excavation (see figures 1 and 2).

Excavation on the north end of the pit extended roughly 10'x25', with a vertical impact of 4 ft. During excavation, black soil was encountered and continued until roughly 1 foot before bedrock was

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encountered at a depth four feet. Field screening instruments indicate that soil was below COGCC guidelines. A grab sample was collected from the bottom of the excavation to confirm compliance with Table 910-1.

Remediation of the southwest corner was conducted due to field screening analysis indicating hydrocarbon concentrations above the COGCC guidelines. Laboratory analysis indicated hydrocarbon concentrations below COGCC Table 910-1 guidelines. At the time laboratory results were received, the southwest corner had been excavated to an area of 10'x20', with a vertical depth of 8 ft. Because the laboratory analytical results indicated the material in the southwest area of concern was below COGCC guidelines, no additional sampling was collected from the excavation.

Laboratory analytical results indicated that hydrocarbon concentrations on the west wall exceeded COGCC Table 910-1 guidelines for TEPH (DRO). Therefore the west wall was excavated a foot, until field screening instruments provided analysis of concentrations below COGCC guidelines. During excavation of the west wall, it was discovered that impacts from the west wall extended below the wall and into the pit bottom. Hydrocarbon impacted soil was evident roughly a foot below the surface on the west side of the pit. The west pit bottom was excavated until hydrocarbon impacted soil was no longer evident, and native/non-impacted soil was apparent throughout the bottom of the excavation. A grab sample was collected from the bottom of the excavation and analyzed for constituents of COGCC Table 910-1.

Figures 3 and 4 illustrate the areas of excavation (i.e. AOCs) which were determined to have been impacted from activity related to the presence and operation/use of the pit.

Sample Analysis

Sampling was performed in accordance with Williams Highlands Pit Closure Plan, Phase IV, Task 2.

See attached Table 1 (additional detail provided in Appendix 1) for summary of initial analytical results and Table 2 for a post remediation result summary (additional detail provided in Appendix 2).

Management of Stockpiled Material

Pit contents and excavated soils have been profiled for disposal at Rio Blanco County, Wray Gulch Landfill. Appendix 4 outlines sampling profile and analysis guidelines prepared and required by KRW Consulting for disposal of hydrocarbon impacted soils to Rio Blanco County Landfill (Wray Gulch).

The pit liner was segregated according to material and placed in a lined bermed containment. Plastic lining material was placed in the south end of the containment and felt liners were placed on the north end. High Plains Services compressed and collected the liners, banding them to pallets for transportation to be recycled. Appendix 5 is a copy of the recycling manifest.

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Backfill Material

Soil was transported from Parachute, CO from a clean stockpile to fill the production pit. Backfill material was transported by bobtail and bell dump trucks over the course of 3 days and placed into the pit with a bulldozer and trackhoe. A Caterpillar D8 bulldozer was utilized to compact the soil as it was being placed inside the pit.

- The soil was placed in one (1) foot lifts and was not compacted beyond the point of making an impenetrable layer but sufficient to suppose subsequent operations and prevent subsidence.
- The pit was reclaimed in accordance with the COGCC 1000 Series Rule in addition to all SUA/COA's per the land owner (Chevron).

Exceptions to COGCC Table 910-1

The only exceedances with COGCC Table 910-1 are within the inorganics and arsenic sampling. Refer to the Sundry Notice for consideration of background inorganic and arsenic concentrations in the immediate area of the subject facility. Refer to Appendix 3 for results and request. Refer to appendix 6 for submitted Sundry Notice.

Analytical Data Management

See Appendix 1 for pre excavation raw analytical data and Appendix 2 for post excavation raw analytical data.

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Figures

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Figure 3



Standing on the north side of the pit facing south, looking along the western edge of the pit. Picture illustrates the high water marks in relation to the crest of the pit and small holes located on the west side.

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Figure 4



Standing on the south side of the pit, facing north. Impacts are visible on the north bottom and extending up the wall roughly 5 feet.

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Figure 5



Standing in the northwest corner facing southeast. Southwest area of concern is noticeable on the right side of the photograph. Red soil is present along the bottom of the pit and extends roughly 3 feet up the south wall.

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Figure 6



Standing on the west side of the pit, facing northeast. North area of concern post excavation of impacted soils.

Figure 7



Standing on the north side of the pit, facing southwest. The southwest area of concern as well as the west wall and west bottom have been remediated. All soil has been excavated and placed in the containment cell for disposal.

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Tables

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Table 1: Pre Excavation Analytical Results

PRE-EXCAVATION	SAMPLE LOCATIONS					
	North Pit Bottom (mg/kg)	South Pit Bottom (mg/kg)	South Wall (mg/kg)	North Wall (mg/kg)	East Wall (mg/kg)	West Wall (mg/kg)
TEPH (DRO)	13,000	260	ND	314	ND	2410
TVPH (GRO)	102	ND	ND	ND	ND	1.4
BENZENE	ND	ND	ND	ND	ND	ND
TOLUENE	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND
M,P-XYLENE	0.902	ND	ND	ND	ND	13.6
O-XYLENE	1.65	ND	ND	ND	ND	ND
ACENAPHTHENE	ND	ND	ND	ND	ND	ND
ACENAPHTHYLENE	ND	ND	ND	ND	ND	ND
ANTHRACENE	ND	ND	ND	ND	ND	ND
BENZO(A)ANTHRACENE	ND	ND	ND	ND	ND	ND
BENZO(A)PYRENE	ND	ND	ND	ND	ND	ND
BENZO(B)FLUORANTHENE	ND	ND	ND	ND	ND	ND
BENZO(G,H,I)PERYLENE	ND	ND	ND	ND	ND	ND
BENZO(K)FLUORANTHENE	ND	ND	ND	ND	ND	ND
CHRYSENE	ND	ND	ND	ND	ND	ND
DIBENZO(A,H)ANTHRACENE	ND	ND	ND	ND	ND	ND
FLUORANTHENE	ND	ND	ND	ND	ND	ND
FLUORENE	ND	ND	ND	ND	ND	ND
INDENO(1,2,3-CD)PYRENE	ND	ND	ND	ND	ND	ND
1-METHYLNAPHTHALENE	ND	ND	ND	ND	ND	2600
2-METHYLNAPHTHALENE	ND	ND	ND	ND	ND	3770
NAPHTHALENE	ND	ND	ND	ND	ND	970
PHENANTHRENE	251	ND	ND	ND	ND	446
PYRENE	ND	ND	ND	ND	ND	ND
ARSENIC	4	3.6	3.3	3.6	3.3	3.4
BARIUM	502	1520	430	496	362	440
CADMIUM	<1.0	<0.99	<0.91	<1.1	<1.0	<0.99
CHROMIUM	35	29.2	25.2	35.7	22.6	31
CHROMIUM (III)	34.2	28.5	24.7	34.2	22.2	30.3
CHROMIUM (IV)	<2.6	<2.4	<2.3	<2.5	<2.3	<2.3
COPPER	13	14.8	15.8	13.1	13.3	14.4
LEAD	12.9	11.1	9.7	13.6	9.5	12.5
MERCURY	<0.12	<0.11	<0.12	<0.12	<0.11	<0.11
NICKEL	19.7	15.3	15.6	19.4	14	18.5
SELENIUM	<5.0	<5.0	<4.6	<5.3	<5.0	<4.9
SILVER	<3.0	<3.0	<2.7	<3.2	<3.0	<3.0
ZINC	41.1	42.6	41.4	43.2	36.3	42.6
ELECTRICAL CONDUCTIVITY (EC)	3670	4280	3020	2520	382	2540
pH	9.1	9.28	8.92	9.36	9.14	9.22
SODIUM ABSORPTION RATIO (SAR)	38.2	45.8	13.9	40	2.93	16
CALCIUM	25.2	20.4	71.1	9.89	20.6	48.6
MAGNESIUM	4.9	2.94	20.1	1.45	5.17	11.4
SODIUM	801	2	515	510	57.5	478

Exceedances are highlighted in yellow.

Note: all results are in, mg/kg = milligram per kilogram, unless noted otherwise

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Table 2: Post Excavation Analytical Results

POST-EXCAVATION	SAMPLE LOCATIONS		
	North Pit Bottom (mg/kg)	West Wall (mg/kg)	West Pit Bottom (mg/kg)
TEPH (DRO)	75.1	ND	17.0
TVPH (GRO)	-	-	
BENZENE	-	-	ND
TOLUENE	-	-	ND
ETHYLBENZENE	-	-	ND
M,P-XYLENE	-	-	ND
O-XYLENE	-	-	ND
ACENAPHTHENE	-	-	ND
ACENAPHTHYLENE	-	-	ND
ANTHRACENE	-	-	ND
BENZO(A)ANTHRACENE	-	-	ND
BENZO(A)PYRENE	-	-	ND
BENZO(B)FLUORANTHENE	-	-	ND
BENZO(G,H,I)PERYLENE	-	-	ND
BENZO(K)FLUORANTHENE	-	-	ND
CHRYSENE	-	-	ND
DIBENZO(A,H)ANTHRACENE	-	-	ND
FLUORANTHENE	-	-	ND
FLUORENE	-	-	20.0
INDENO(1,2,3-CD)PYRENE	-	-	ND
1-METHYLNAPHTHALENE	-	-	31.0
2-METHYLNAPHTHALENE	-	-	30.8
NAPHTHALENE	-	-	ND
PHENANTHRENE	-	-	ND
PYRENE	-	-	ND
ARSENIC	-	-	2.9
BARIUM	-	-	353
CADMIUM	-	-	<1.2
CHROMIUM	-	-	32.4
CHROMIUM (III)	-	-	32.1
CHROMIUM (IV)	-	-	<2.5
COPPER	-	-	15.3
LEAD	-	-	12.9
MERCURY	-	-	<0.12
NICKEL	-	-	18
SELENIUM	-	-	<6.2
SILVER	-	-	<3.7
ZINC	-	-	44.7
ELECTRICAL CONDUCTIVITY (EC)	-	-	4000
pH	-	-	8.33
SODIUM ABSORPTION RATIO (SAR)	-	-	4.25
CALCIUM	-	-	346
MAGNESIUM	-	-	93.5
SODIUM	-	-	345

Only analytes which exceeded allowable concentrations in the pre-excavation samples were subjected to subsequent testing post remediation.

Note: all results are in, mg/kg = milligram per kilogram, unless noted otherwise

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Table 3: Background Analytical Results

	Arsenic	Conductivity	pH	Calcium	Magnesium	Sodium	Sodium Adsorption Ration
BKGD 1	3.9						
BKGD 2	3.4	284	7.14	24.5	5.18	24.7	1.18
BKGD 3	3.3						

Note: all results are in, mg/kg = milligram per kilogram, unless noted otherwise

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Appendix 1: Pre Excavation Raw Analytical



Technical Report for

Williams Production

TR 32-21-597-PT5021 Pit Closure

Accutest Job Number: D15048

Sampling Date: 07/07/10

Report to:

HRL Compliance Solutions
744 Horizon Court, Suite 140
Grand Junction, CO 81506
hlucero@hrlcomp.com

ATTN: Herman Lucero

Total number of pages in report: **118**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Jesse L. Smith
Laboratory Director

Client Service contact: Shea Greiner 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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Test results relate only to samples analyzed.



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Sample Summary

Williams Production

Job No: D15048

TR 32-21-597-PT5021 Pit Closure

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D15048-1	07/07/10	14:00 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-NB
D15048-1A	07/07/10	14:00 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-NB
D15048-2	07/07/10	14:15 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-EW
D15048-2A	07/07/10	14:15 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-EW
D15048-3	07/07/10	14:30 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-SB
D15048-3A	07/07/10	14:30 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-SB
D15048-4	07/07/10	14:45 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-NW
D15048-4A	07/07/10	14:45 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-NW
D15048-5	07/07/10	15:30 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-SW
D15048-5A	07/07/10	15:30 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-SW
D15048-6	07/07/10	15:00 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-WW
D15048-6A	07/07/10	15:00 KR	07/09/10	SO	Soil	TR 32-21-597-PT5021-WW

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Williams Production

Job No D15048

Site: TR 32-21-597-PT5021 Pit Closure

Report Dat 7/16/2010 3:55:51 PM

On 07/09/2010, six (6) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 5.7°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D15048 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Extractables by GCMS By Method SW846 8270C BY SIM

Matrix SO	Batch ID: OP2150
------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D15048-2MS and D15048-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB315
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D14951-1MS and D14951-1MSD were used as the QC samples indicated.
- Sample D15048-1 has the surrogate outside control limits due to coeluting interference. This does not affect the analysis of the target analytes, which elute before the interference.

Matrix SO	Batch ID: GGB318
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D15048-3MS and D15048-3MSD were used as the QC samples indicated.
- Sample D15048-1 has the surrogate outside control limits due to coeluting interference. This does not affect the analysis of the target analytes, which elute before the interference.

Volatiles by GC By Method SW846 8021B

Matrix SO

Batch ID: GTB315

- All samples were analyzed within the recommended method holding time.
- Samples D14951-1MS and D14951-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Toluene and the MS recovery of m,p-Xylene are outside control limits. The blank spike (BS) recoveries of these analytes are within QC limits, proving the analysis is in control.
- Samples D14951-1MS and D15048-1 have the surrogate outside control limits due to coeluting interference. This does not affect the analysis of the target analytes, which elute before the interference.

Matrix SO

Batch ID: GTB318

- All samples were analyzed within the recommended method holding time.
- Samples D15048-3MS and D15048-3MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Samples D14951-1MS and D15048-1 have the surrogate outside control limits due to coeluting interference. This does not affect the analysis of the target analytes, which elute before the interference.

Extractables by GC By Method SW846-8015B

Matrix SO

Batch ID: OP2151

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D14909-1MS and D14909-1MSD were used as the QC samples indicated.

Metals By Method SW846 6010B

Matrix AQ

Batch ID: MP2311

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D15048-2AMS and D15048-2AMSD were used as the QC samples for the metals analysis.

Matrix SO

Batch ID: MP2277

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D15048-1MS, D15048-1MSD, and D15048-1SDL were used as the QC samples for the metals analysis.
- The matrix spike and matrix spike duplicate (MS/MSD) recoveries of Barium are outside control limits. The blank spike (BS) recovery of Barium is within QC limits, proving the analysis is in control.
- The serial dilution RPDs for Barium, Cadmium, Chromium, Nickel, Selenium, Silver, and Zinc are outside control limits for sample MP2277-SD1. The percent differences are acceptable for Cadmium, Selenium, and Silver due to low initial sample concentration (< 50 times IDL).
- MP2277-SD1 for Barium, Chromium, Nickel, and Zinc: Serial dilution indicates possible matrix interference.

Metals By Method SW846 6020

Matrix SO	Batch ID: MP2278
------------------	-------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D15048-1MS, D15048-1MSD, and D15048-1SDL were used as the QC samples for the metals analysis.

Metals By Method SW846 7471A

Matrix SO	Batch ID: MP2290
------------------	-------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D15048-1MSD and D15048-1MS were used as the QC samples for the Mercury analysis.
- The matrix spike (MS) recovery of Mercury is outside control limits. The blank spike (BS) recovery of Mercury is within QC limits, proving the analysis is in control.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO	Batch ID: M:GN32374
------------------	----------------------------

- The data for ASTM E1498-76M meets quality control requirements.
- The following samples were run outside of holding time for method ASTM E1498-76M: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6
- Redox Potential Vs H2: Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method LADNR29B

Matrix SO	Batch ID: R3194
------------------	------------------------

- The data for LADNR29B meets quality control requirements.
- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO	Batch ID: GN5289
------------------	-------------------------

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 3060/7196A M

Matrix SO	Batch ID: R3208
------------------	------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- Trivalent Chromium, : Calculated as: $(\text{Chromium}) - (\text{Hexavalent Chromium})$

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO	Batch ID: M:GP11796
------------------	----------------------------

- The data for SW846 3060A/7196A meets quality control requirements.
- Hexavalent Chromium, : Analysis performed at Accutest Laboratories, Marlborough, MA.

Wet Chemistry By Method SW846 9045C

Matrix SO

Batch ID: GN5285

- The following samples were run outside of holding time for method SW846 9045C: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D15048

Site: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Report Date 7/16/2010 5:26:21 PM

6 Sample(s) were collected on 07/07/2010 and were received at Accutest on 07/09/2010 properly preserved, at 4.9 Deg. C and intact. These Samples received an Accutest job number of D15048. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Wet Chemistry By Method ASTM E1498-76M

Matrix SO

Batch ID: GN32374

- Sample(s) D15048-2DUP were used as the QC samples for Redox Potential Vs H2.

Wet Chemistry By Method SW846 3060A/7196A

Matrix SO

Batch ID: GP11796

- All samples were distilled within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D14946-1DUP, D14946-1MS were used as the QC samples for Chromium, Hexavalent.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D15048).



Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-NB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-1	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	77.1
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01360.D	5	07/14/10	TMB	07/12/10	OP2150	E3G35
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	43	40	ug/kg	
208-96-8	Acenaphthylene	ND	220	45	ug/kg	
120-12-7	Anthracene	ND	43	28	ug/kg	
56-55-3	Benzo(a)anthracene	ND	43	42	ug/kg	
50-32-8	Benzo(a)pyrene	ND	43	27	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	43	31	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	43	27	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	43	27	ug/kg	
218-01-9	Chrysene	ND	43	22	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	43	32	ug/kg	
206-44-0	Fluoranthene	ND	43	27	ug/kg	
86-73-7	Fluorene	ND	43	42	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	43	28	ug/kg	
90-12-0	1-Methylnaphthalene	ND	43	38	ug/kg	
91-57-6	2-Methylnaphthalene	ND	220	66	ug/kg	
91-20-3	Naphthalene	ND	220	48	ug/kg	
85-01-8	Phenanthrene	251	43	34	ug/kg	
129-00-0	Pyrene	ND	43	29	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	138%		10-193%
321-60-8	2-Fluorobiphenyl	76%		20-138%
1718-51-0	Terphenyl-d14	86%		17-174%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597-PT5021-NB	Date Sampled: 07/07/10
Lab Sample ID: D15048-1	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 77.1
Method: SW846 8015B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5777.D	1	07/11/10	DG	n/a	n/a	GGB315
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	10.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	102	29	29	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	506% ^a		60-140%		

(a) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597-PT5021-NB	Date Sampled: 07/07/10
Lab Sample ID: D15048-1	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 77.1
Method: SW846 8021B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TB5777.D	1	07/11/10	DG	n/a	n/a	GTB315
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	10.0 ml	100 ul
Run #2			

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	140	140	ug/kg	
108-88-3	Toluene	ND	290	290	ug/kg	
100-41-4	Ethylbenzene	ND	290	290	ug/kg	
	m,p-Xylene	902	290	290	ug/kg	
95-47-6	o-Xylene	1650	290	290	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	354% ^a		60-140%

(a) Outside control limits due to matrix interference.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597-PT5021-NB	Date Sampled: 07/07/10
Lab Sample ID: D15048-1	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 77.1
Method: SW846-8015B SW846 3550B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2689.D	50	07/13/10	CP	07/12/10	OP2151	GFD136
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	13000	860	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	121%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-NB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-1	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	77.1
Project:	TR 32-21-597-PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	4.0	0.40	mg/kg	5	07/09/10	07/09/10 GJ	SW846 6020 ¹	SW846 3050B ⁵
Barium	502	1.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Cadmium	< 1.0	1.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Chromium	35.0	1.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Copper	13.0	0.50	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Lead	12.9	5.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Mercury	< 0.12	0.12	mg/kg	1	07/12/10	07/12/10 RN	SW846 7471A ²	SW846 7471A ⁶
Nickel	19.7	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Selenium	< 5.0	5.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Silver	< 3.0	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Zinc	41.1	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴

- (1) Instrument QC Batch: MA813
- (2) Instrument QC Batch: MA817
- (3) Instrument QC Batch: MA819
- (4) Prep QC Batch: MP2277
- (5) Prep QC Batch: MP2278
- (6) Prep QC Batch: MP2290

RL = Reporting Limit

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-NB	Date Sampled: 07/07/10
Lab Sample ID: D15048-1	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 77.1
Project: TR 32-21-597-PT5021 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.6	2.6	mg/kg	1	07/12/10 18:17	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	34.2	3.6	mg/kg	1	07/12/10 18:17	AMA	SW846 3060/7196A M
Redox Potential Vs H2 ^a	286		mv	1	07/14/10	AMA	ASTM E1498-76M
Solids, Percent	77.1		%	1	07/11/10	CJ	SM19 2540B M
Specific Conductivity	3670	1.0	umhos/cm	1	07/14/10	JD	DEPT.OF AG, BOOK N9
pH	9.10		su	1	07/09/10 11:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-NB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-1A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	77.1
Project:	TR 32-21-597-PT5021 Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	25.2	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	4.90	1.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	801	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA824

(2) Prep QC Batch: MP2311

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-NB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-1A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	77.1
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	38.2		ratio	1	07/14/10 19:43	JM	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-EW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-2	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.0
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01361.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	8.0	7.5	ug/kg	
208-96-8	Acenaphthylene	ND	40	8.3	ug/kg	
120-12-7	Anthracene	ND	8.0	5.2	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.0	7.9	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.0	5.0	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.0	5.8	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	8.0	5.0	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.0	5.0	ug/kg	
218-01-9	Chrysene	ND	8.0	4.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.0	5.9	ug/kg	
206-44-0	Fluoranthene	ND	8.0	4.9	ug/kg	
86-73-7	Fluorene	ND	8.0	7.9	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.0	5.2	ug/kg	
90-12-0	1-Methylnaphthalene	ND	8.0	7.1	ug/kg	
91-57-6	2-Methylnaphthalene	ND	40	12	ug/kg	
91-20-3	Naphthalene	ND	40	8.9	ug/kg	
85-01-8	Phenanthrene	ND	8.0	6.4	ug/kg	
129-00-0	Pyrene	ND	8.0	5.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	56%		10-193%
321-60-8	2-Fluorobiphenyl	52%		20-138%
1718-51-0	Terphenyl-d14	64%		17-174%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-EW	Date Sampled: 07/07/10
Lab Sample ID: D15048-2	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.0
Method: SW846 8015B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5831.D	1	07/13/10	DG	n/a	n/a	GGB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.2	1.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	91%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-EW	Date Sampled: 07/07/10
Lab Sample ID: D15048-2	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.0
Method: SW846 8021B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TB5831.D	1	07/13/10	DG	n/a	n/a	GTB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	6.0	6.0	ug/kg	
108-88-3	Toluene	ND	12	12	ug/kg	
100-41-4	Ethylbenzene	ND	12	12	ug/kg	
	m,p-Xylene	ND	12	12	ug/kg	
95-47-6	o-Xylene	ND	12	12	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	104%		60-140%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-EW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-2	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.0
Method:	SW846-8015B SW846 3550B		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2690.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	16	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	78%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-EW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-2	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.0
Project:	TR 32-21-597-PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.3	0.40	mg/kg	5	07/09/10	07/09/10 GJ	SW846 6020 ¹	SW846 3050B ⁵
Barium	362	1.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Cadmium	< 1.0	1.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Chromium	22.6	1.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Copper	13.3	0.50	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Lead	9.5	5.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Mercury	< 0.11	0.11	mg/kg	1	07/12/10	07/12/10 RN	SW846 7471A ²	SW846 7471A ⁶
Nickel	14.0	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Selenium	< 5.0	5.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Silver	< 3.0	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Zinc	36.3	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴

- (1) Instrument QC Batch: MA813
- (2) Instrument QC Batch: MA817
- (3) Instrument QC Batch: MA819
- (4) Prep QC Batch: MP2277
- (5) Prep QC Batch: MP2278
- (6) Prep QC Batch: MP2290

RL = Reporting Limit

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-EW	Date Sampled: 07/07/10
Lab Sample ID: D15048-2	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.0
Project: TR 32-21-597-PT5021 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.3	2.3	mg/kg	1	07/12/10 18:17	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	22.2	3.3	mg/kg	1	07/12/10 18:17	AMA	SW846 3060/7196A M
Redox Potential Vs H2 ^a	330		mv	1	07/14/10	AMA	ASTM E1498-76M
Solids, Percent	83		%	1	07/11/10	CJ	SM19 2540B M
Specific Conductivity	382	1.0	umhos/cm	1	07/14/10	JD	DEPT.OF AG, BOOK N9
pH	9.14		su	1	07/09/10 11:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-EW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-2A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.0
Project:	TR 32-21-597-PT5021 Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	20.6	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	5.17	1.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	57.5	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA824

(2) Prep QC Batch: MP2311

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-EW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-2A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.0
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	2.93		ratio	1	07/14/10 19:19	JM	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-3	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	81.8
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01364.D	2	07/14/10	TMB	07/12/10	OP2150	E3G35
Run #2							

Run #1	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	16	15	ug/kg	
208-96-8	Acenaphthylene	ND	81	17	ug/kg	
120-12-7	Anthracene	ND	16	11	ug/kg	
56-55-3	Benzo(a)anthracene	ND	16	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	16	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	16	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	16	10	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	16	10	ug/kg	
218-01-9	Chrysene	ND	16	8.1	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	16	12	ug/kg	
206-44-0	Fluoranthene	ND	16	10	ug/kg	
86-73-7	Fluorene	ND	16	16	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	16	11	ug/kg	
90-12-0	1-Methylnaphthalene	ND	16	14	ug/kg	
91-57-6	2-Methylnaphthalene	ND	81	25	ug/kg	
91-20-3	Naphthalene	ND	81	18	ug/kg	
85-01-8	Phenanthrene	ND	16	13	ug/kg	
129-00-0	Pyrene	ND	16	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	53%		10-193%
321-60-8	2-Fluorobiphenyl	51%		20-138%
1718-51-0	Terphenyl-d14	54%		17-174%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

Client Sample ID: TR 32-21-597-PT5021-SB	Date Sampled: 07/07/10
Lab Sample ID: D15048-3	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 81.8
Method: SW846 8015B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5832.D	1	07/13/10	DG	n/a	n/a	GGB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.2	1.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	100%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

Client Sample ID: TR 32-21-597-PT5021-SB		Date Sampled: 07/07/10
Lab Sample ID: D15048-3		Date Received: 07/09/10
Matrix: SO - Soil		Percent Solids: 81.8
Method: SW846 8021B		
Project: TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TB5832.D	1	07/13/10	DG	n/a	n/a	GTB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	6.1	6.1	ug/kg	
108-88-3	Toluene	ND	12	12	ug/kg	
100-41-4	Ethylbenzene	ND	12	12	ug/kg	
	m,p-Xylene	ND	12	12	ug/kg	
95-47-6	o-Xylene	ND	12	12	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	105%		60-140%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.5
3

Client Sample ID: TR 32-21-597-PT5021-SB	Date Sampled: 07/07/10
Lab Sample ID: D15048-3	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 81.8
Method: SW846-8015B SW846 3550B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2691.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	260	16	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	96%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-3	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	81.8
Project:	TR 32-21-597-PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.6	0.40	mg/kg	5	07/09/10	07/09/10 GJ	SW846 6020 ¹	SW846 3050B ⁵
Barium	1520	0.99	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Cadmium	< 0.99	0.99	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Chromium	29.2	0.99	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Copper	14.8	0.50	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Lead	11.1	5.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Mercury	< 0.11	0.11	mg/kg	1	07/12/10	07/12/10 RN	SW846 7471A ²	SW846 7471A ⁶
Nickel	15.3	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Selenium	< 5.0	5.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Silver	< 3.0	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Zinc	42.6	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴

- (1) Instrument QC Batch: MA813
- (2) Instrument QC Batch: MA817
- (3) Instrument QC Batch: MA819
- (4) Prep QC Batch: MP2277
- (5) Prep QC Batch: MP2278
- (6) Prep QC Batch: MP2290

RL = Reporting Limit

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-SB	Date Sampled: 07/07/10
Lab Sample ID: D15048-3	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 81.8
Project: TR 32-21-597-PT5021 Pit Closure	

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.4	2.4	mg/kg	1	07/12/10 18:17	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	28.5	3.4	mg/kg	1	07/12/10 18:22	JM	SW846 3060/7196A M
Redox Potential Vs H2 ^a	293		mv	1	07/14/10	AMA	ASTM E1498-76M
Solids, Percent	81.8		%	1	07/11/10	CJ	SM19 2540B M
Specific Conductivity	4280	1.0	umhos/cm	1	07/14/10	JD	DEPT.OF AG, BOOK N9
pH	9.28		su	1	07/09/10 11:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-3A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	81.8
Project:	TR 32-21-597-PT5021 Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	20.4	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ³
Magnesium	2.94	1.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ³
Sodium	837	2.0	mg/l	1	07/14/10	07/15/10 JM	SW846 6010B ²	EPA 200.7 ³

- (1) Instrument QC Batch: MA824
- (2) Instrument QC Batch: MA827
- (3) Prep QC Batch: MP2311

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SB	Date Sampled:	07/07/10
Lab Sample ID:	D15048-3A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	81.8
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	45.8		ratio	1	07/15/10 12:13	JM	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-NW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-4	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	76.6
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01365.D	5	07/14/10	TMB	07/12/10	OP2150	E3G35
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	44	41	ug/kg	
208-96-8	Acenaphthylene	ND	220	45	ug/kg	
120-12-7	Anthracene	ND	44	28	ug/kg	
56-55-3	Benzo(a)anthracene	ND	44	43	ug/kg	
50-32-8	Benzo(a)pyrene	ND	44	27	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	44	32	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	44	27	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	44	27	ug/kg	
218-01-9	Chrysene	ND	44	22	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	44	32	ug/kg	
206-44-0	Fluoranthene	ND	44	27	ug/kg	
86-73-7	Fluorene	ND	44	43	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	44	29	ug/kg	
90-12-0	1-Methylnaphthalene	ND	44	39	ug/kg	
91-57-6	2-Methylnaphthalene	ND	220	66	ug/kg	
91-20-3	Naphthalene	ND	220	48	ug/kg	
85-01-8	Phenanthrene	ND	44	35	ug/kg	
129-00-0	Pyrene	ND	44	29	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	49%		10-193%
321-60-8	2-Fluorobiphenyl	48%		20-138%
1718-51-0	Terphenyl-d14	49%		17-174%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

37
3

Client Sample ID: TR 32-21-597-PT5021-NW	Date Sampled: 07/07/10
Lab Sample ID: D15048-4	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 76.6
Method: SW846 8015B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5833.D	1	07/13/10	DG	n/a	n/a	GGB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.3	1.3	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	99%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-NW	Date Sampled: 07/07/10
Lab Sample ID: D15048-4	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 76.6
Method: SW846 8021B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TB5833.D	1	07/13/10	DG	n/a	n/a	GTB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	6.5	6.5	ug/kg	
108-88-3	Toluene	ND	13	13	ug/kg	
100-41-4	Ethylbenzene	ND	13	13	ug/kg	
	m,p-Xylene	ND	13	13	ug/kg	
95-47-6	o-Xylene	ND	13	13	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	113%		60-140%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

37
3

Client Sample ID: TR 32-21-597-PT5021-NW	Date Sampled: 07/07/10
Lab Sample ID: D15048-4	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 76.6
Method: SW846-8015B SW846 3550B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2692.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	314	17	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	94%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-NW	Date Sampled: 07/07/10
Lab Sample ID: D15048-4	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 76.6
Project: TR 32-21-597-PT5021 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.6	0.42	mg/kg	5	07/09/10	07/09/10 GJ	SW846 6020 ¹	SW846 3050B ⁵
Barium	496	1.1	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Cadmium	< 1.1	1.1	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Chromium	35.7	1.1	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Copper	13.1	0.53	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Lead	13.6	5.3	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Mercury	< 0.12	0.12	mg/kg	1	07/12/10	07/12/10 RN	SW846 7471A ²	SW846 7471A ⁶
Nickel	19.4	3.2	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Selenium	< 5.3	5.3	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Silver	< 3.2	3.2	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Zinc	43.2	3.2	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴

- (1) Instrument QC Batch: MA813
- (2) Instrument QC Batch: MA817
- (3) Instrument QC Batch: MA819
- (4) Prep QC Batch: MP2277
- (5) Prep QC Batch: MP2278
- (6) Prep QC Batch: MP2290

RL = Reporting Limit

Report of Analysis

37
3

Client Sample ID: TR 32-21-597-PT5021-NW		Date Sampled: 07/07/10
Lab Sample ID: D15048-4		Date Received: 07/09/10
Matrix: SO - Soil		Percent Solids: 76.6
Project: TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.5	2.5	mg/kg	1	07/12/10 18:17	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	34.2	3.6	mg/kg	1	07/12/10 18:28	JM	SW846 3060/7196A M
Redox Potential Vs H2 ^a	302		mv	1	07/14/10	AMA	ASTM E1498-76M
Solids, Percent	76.6		%	1	07/11/10	CJ	SM19 2540B M
Specific Conductivity	2520	1.0	umhos/cm	1	07/14/10	JD	DEPT.OF AG, BOOK N9
pH	9.36		su	1	07/09/10 11:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-NW	Date Sampled: 07/07/10
Lab Sample ID: D15048-4A	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 76.6
Project: TR 32-21-597-PT5021 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	9.89	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	1.45	1.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	510	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA824

(2) Prep QC Batch: MP2311

RL = Reporting Limit

Report of Analysis



Client Sample ID:	TR 32-21-597-PT5021-NW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-4A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	76.6
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	40.0		ratio	1	07/14/10 20:06	JM	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-5	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.5
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01366.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	8.0	7.5	ug/kg	
208-96-8	Acenaphthylene	ND	40	8.2	ug/kg	
120-12-7	Anthracene	ND	8.0	5.1	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.0	7.8	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.0	5.0	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.0	5.8	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	8.0	5.0	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.0	5.0	ug/kg	
218-01-9	Chrysene	ND	8.0	4.0	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.0	5.9	ug/kg	
206-44-0	Fluoranthene	ND	8.0	4.9	ug/kg	
86-73-7	Fluorene	ND	8.0	7.8	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.0	5.2	ug/kg	
90-12-0	1-Methylnaphthalene	ND	8.0	7.1	ug/kg	
91-57-6	2-Methylnaphthalene	ND	40	12	ug/kg	
91-20-3	Naphthalene	ND	40	8.8	ug/kg	
85-01-8	Phenanthrene	ND	8.0	6.3	ug/kg	
129-00-0	Pyrene	ND	8.0	5.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	67%		10-193%
321-60-8	2-Fluorobiphenyl	59%		20-138%
1718-51-0	Terphenyl-d14	73%		17-174%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

3.9
3

Client Sample ID: TR 32-21-597-PT5021-SW	Date Sampled: 07/07/10
Lab Sample ID: D15048-5	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.5
Method: SW846 8015B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5834.D	1	07/13/10	DG	n/a	n/a	GGB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.2	1.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	101%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-SW	Date Sampled: 07/07/10
Lab Sample ID: D15048-5	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.5
Method: SW846 8021B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TB5834.D	1	07/13/10	DG	n/a	n/a	GTB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	6.0	6.0	ug/kg	
108-88-3	Toluene	ND	12	12	ug/kg	
100-41-4	Ethylbenzene	ND	12	12	ug/kg	
	m,p-Xylene	ND	12	12	ug/kg	
95-47-6	o-Xylene	ND	12	12	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	110%		60-140%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.9
3

Client Sample ID: TR 32-21-597-PT5021-SW	Date Sampled: 07/07/10
Lab Sample ID: D15048-5	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.5
Method: SW846-8015B SW846 3550B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2693.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	16	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	104%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-5	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.5
Project:	TR 32-21-597-PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.3	0.37	mg/kg	5	07/09/10	07/10/10 GJ	SW846 6020 ¹	SW846 3050B ⁵
Barium	430	0.91	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Cadmium	< 0.91	0.91	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Chromium	25.2	0.91	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Copper	15.8	0.46	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Lead	9.7	4.6	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Mercury	< 0.12	0.12	mg/kg	1	07/12/10	07/12/10 RN	SW846 7471A ²	SW846 7471A ⁶
Nickel	15.6	2.7	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Selenium	< 4.6	4.6	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Silver	< 2.7	2.7	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Zinc	41.4	2.7	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴

- (1) Instrument QC Batch: MA813
- (2) Instrument QC Batch: MA817
- (3) Instrument QC Batch: MA819
- (4) Prep QC Batch: MP2277
- (5) Prep QC Batch: MP2278
- (6) Prep QC Batch: MP2290

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-5	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.5
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.3	2.3	mg/kg	1	07/12/10 18:18	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	24.7	3.2	mg/kg	1	07/12/10 18:45	JM	SW846 3060/7196A M
Redox Potential Vs H2 ^a	301		mv	1	07/14/10	AMA	ASTM E1498-76M
Solids, Percent	83.5		%	1	07/11/10	CJ	SM19 2540B M
Specific Conductivity	3020	1.0	umhos/cm	1	07/14/10	JD	DEPT.OF AG, BOOK N9
pH	8.92		su	1	07/09/10 11:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-SW	Date Sampled: 07/07/10
Lab Sample ID: D15048-5A	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.5
Project: TR 32-21-597-PT5021 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	71.1	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	20.1	1.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	515	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA824

(2) Prep QC Batch: MP2311

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-SW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-5A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.5
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	13.9		ratio	1	07/14/10 20:12	JM	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-6	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.6
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01367.D	5	07/15/10	TMB	07/12/10	OP2150	E3G35
Run #2	3G01387.D	5	07/16/10	TMB	07/12/10	OP2150	E3G36

	Initial Weight	Final Volume
Run #1	30.0 g	10.0 ml
Run #2	30.0 g	10.0 ml

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	400	370	ug/kg	
208-96-8	Acenaphthylene	ND	2000	410	ug/kg	
120-12-7	Anthracene	ND	400	260	ug/kg	
56-55-3	Benzo(a)anthracene	ND	400	390	ug/kg	
50-32-8	Benzo(a)pyrene	ND	400	250	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	400	290	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	400	250	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	400	250	ug/kg	
218-01-9	Chrysene	ND	400	200	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	400	300	ug/kg	
206-44-0	Fluoranthene	ND	400	250	ug/kg	
86-73-7	Fluorene	ND	400	390	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	400	260	ug/kg	
90-12-0	1-Methylnaphthalene	2600	400	350	ug/kg	
91-57-6	2-Methylnaphthalene	3770 ^a	2000	610	ug/kg	
91-20-3	Naphthalene	971	2000	440	ug/kg	J
85-01-8	Phenanthrene	446	400	320	ug/kg	
129-00-0	Pyrene	ND	400	270	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	77%	91%	10-193%
321-60-8	2-Fluorobiphenyl	79%	102%	20-138%
1718-51-0	Terphenyl-d14	98%	114%	17-174%

(a) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-WW	Date Sampled: 07/07/10
Lab Sample ID: D15048-6	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.6
Method: SW846 8015B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5835.D	1	07/13/10	DG	n/a	n/a	GGB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	1.40	1.2	1.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	139%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-WW	Date Sampled: 07/07/10
Lab Sample ID: D15048-6	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.6
Method: SW846 8021B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TB5835.D	1	07/13/10	DG	n/a	n/a	GTB318
Run #2							

Run #	Initial Weight
Run #1	1.0 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	6.0	6.0	ug/kg	
108-88-3	Toluene	ND	12	12	ug/kg	
100-41-4	Ethylbenzene	ND	12	12	ug/kg	
	m,p-Xylene	13.6	12	12	ug/kg	
95-47-6	o-Xylene	ND	12	12	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	112%		60-140%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: TR 32-21-597-PT5021-WW	Date Sampled: 07/07/10
Lab Sample ID: D15048-6	Date Received: 07/09/10
Matrix: SO - Soil	Percent Solids: 83.6
Method: SW846-8015B SW846 3550B	
Project: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2694.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	2410	16	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	111%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-6	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.6
Project:	TR 32-21-597-PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.4	0.40	mg/kg	5	07/09/10	07/10/10 GJ	SW846 6020 ¹	SW846 3050B ⁵
Barium	440	0.99	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Cadmium	< 0.99	0.99	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Chromium	31.0	0.99	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Copper	14.4	0.49	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Lead	12.5	4.9	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Mercury	< 0.11	0.11	mg/kg	1	07/12/10	07/12/10 RN	SW846 7471A ²	SW846 7471A ⁶
Nickel	18.5	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Selenium	< 4.9	4.9	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Silver	< 3.0	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴
Zinc	42.6	3.0	mg/kg	1	07/09/10	07/12/10 JM	SW846 6010B ³	SW846 3050B ⁴

- (1) Instrument QC Batch: MA813
- (2) Instrument QC Batch: MA817
- (3) Instrument QC Batch: MA819
- (4) Prep QC Batch: MP2277
- (5) Prep QC Batch: MP2278
- (6) Prep QC Batch: MP2290

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-6	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.6
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.3	2.3	mg/kg	1	07/12/10 18:18	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	30.3	3.3	mg/kg	1	07/12/10 18:54	JM	SW846 3060/7196A M
Redox Potential Vs H2 ^a	303		mv	1	07/14/10	AMA	ASTM E1498-76M
Solids, Percent	83.6		%	1	07/11/10	CJ	SM19 2540B M
Specific Conductivity	2540	1.0	umhos/cm	1	07/14/10	JD	DEPT.OF AG, BOOK N9
pH	9.22		su	1	07/09/10 11:45	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-6A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.6
Project:	TR 32-21-597-PT5021 Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	48.6	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	11.4	1.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	478	2.0	mg/l	1	07/14/10	07/14/10 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA824

(2) Prep QC Batch: MP2311

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WW	Date Sampled:	07/07/10
Lab Sample ID:	D15048-6A	Date Received:	07/09/10
Matrix:	SO - Soil	Percent Solids:	83.6
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	16.0		ratio	1	07/14/10 20:19	JM	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

Client / Reporting Information		Project Information				Requested Analysis (see TEST CODE sheet)										Matrix Codes
Company Name HR Compliance Solutions Inc		Project Name: TR 32-21-597 - PT5021 Pit Closure														DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB- Rinse Blank TB-Trip Blank
Street Address 744 Horizon Ct Suite 140		Billing Information (if different from Report to)														
City, State, Zip Grand Junction CO 81506		Company Name Williams Production RMT														
Project Contact Herman Lucero		Street Address PO Box 370														
Phone # 970 243 3271		City, State, Zip Parachute CO 81635														
Sampler(s) Name(s) Kris Rowe		Project Manager Herman Lucero														
Turnaround Time (Business days)		Data Deliverable Information				Comments / Special Instructions										
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> UST Analysis 3-5 Days <input type="checkbox"/> 6 - 9 Day RUSH <input checked="" type="checkbox"/> 3 - 5 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY		Approved By (Accutest PM): / Date: 				<input type="checkbox"/> Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/> Level 4 Level 1 = Results Only Level 2 = Results + QC Summary + Case Narrative Level 3 = Results + QC Summary + Partial Raw data Level 4 = Full Deliverable <input type="checkbox"/> PDF <input type="checkbox"/> EDD Format <input type="checkbox"/> Other										• Run 910.1 Suite • For metals, report total Barium and do not run boron
Emergency & Rush T/A data available VIA Lablink		Sample Custody must be documented below each time samples change possession, including courier delivery.														
Relinquished by Sampler: [Signature]		Date/Time: 7/7/10 1700		Received By: 1		Relinquished By: 2		Date/Time:		Received By: 2/DAVID PORTER		Date/Time: 7/9/10		Received By: 9:00 AM		
Relinquished by: 3		Date/Time:		Received By: 3		Relinquished By: 4		Date/Time:		Received By: 4		Date/Time:		Received By:		
Relinquished by: 5		Date/Time:		Received By: 5		Custody Seal #		<input checked="" type="checkbox"/> Intact <input type="checkbox"/> Not intact		Preserved where applicable <input checked="" type="checkbox"/>		On Ice <input checked="" type="checkbox"/>		Cooler Temp. 5.7		

4.1
4



GC/MS Semi-volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2150-MB	3G01358.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	6.7	6.2	ug/kg	
208-96-8	Acenaphthylene	ND	33	6.9	ug/kg	
120-12-7	Anthracene	ND	6.7	4.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	6.7	6.5	ug/kg	
50-32-8	Benzo(a)pyrene	ND	6.7	4.2	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	6.7	4.8	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	6.7	4.2	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	6.7	4.2	ug/kg	
218-01-9	Chrysene	ND	6.7	3.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	6.7	4.9	ug/kg	
206-44-0	Fluoranthene	ND	6.7	4.1	ug/kg	
86-73-7	Fluorene	ND	6.7	6.5	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	4.4	ug/kg	
90-12-0	1-Methylnaphthalene	ND	6.7	5.9	ug/kg	
91-57-6	2-Methylnaphthalene	ND	33	10	ug/kg	
91-20-3	Naphthalene	ND	33	7.4	ug/kg	
85-01-8	Phenanthrene	ND	6.7	5.3	ug/kg	
129-00-0	Pyrene	ND	6.7	4.5	ug/kg	

CAS No.	Surrogate Recoveries	Limits	
4165-60-0	Nitrobenzene-d5	52%	10-193%
321-60-8	2-Fluorobiphenyl	47%	20-138%
1718-51-0	Terphenyl-d14	62%	17-174%

5.1.1
5

Blank Spike Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2150-BS	3G01359.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	38.7	46	40-136
208-96-8	Acenaphthylene	83.3	38.8	47	42-139
120-12-7	Anthracene	83.3	38.9	47	40-141
56-55-3	Benzo(a)anthracene	83.3	41.8	50	38-143
50-32-8	Benzo(a)pyrene	83.3	42.1	51	39-145
205-99-2	Benzo(b)fluoranthene	83.3	38.2	46	38-151
191-24-2	Benzo(g,h,i)perylene	83.3	51.5	62	35-136
207-08-9	Benzo(k)fluoranthene	83.3	36.4	44	38-147
218-01-9	Chrysene	83.3	37.4	45	39-137
53-70-3	Dibenzo(a,h)anthracene	83.3	57.2	69	35-139
206-44-0	Fluoranthene	83.3	37.8	45	34-132
86-73-7	Fluorene	83.3	40.5	49	41-136
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	52.9	63	31-144
90-12-0	1-Methylnaphthalene	83.3	37.4	45	36-130
91-57-6	2-Methylnaphthalene	83.3	58.9	71	40-131
91-20-3	Naphthalene	83.3	43.1	52	36-130
85-01-8	Phenanthrene	83.3	38.4	46	40-135
129-00-0	Pyrene	83.3	35.6	43	29-157

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	54%	10-193%
321-60-8	2-Fluorobiphenyl	47%	20-138%
1718-51-0	Terphenyl-d14	60%	17-174%

5.2.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2150-MS	3G01362.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35
OP2150-MSD	3G01363.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35
D15048-2	3G01361.D	1	07/14/10	TMB	07/12/10	OP2150	E3G35

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	D15048-2 ug/kg	Spike Q	ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND	100	54.1	54	46.1	46	16	20-151/30	
208-96-8	Acenaphthylene	ND	100	55.9	56	49.4	49	12	23-156/30	
120-12-7	Anthracene	ND	100	54.1	54	45.3	45	18	25-149/30	
56-55-3	Benzo(a)anthracene	ND	100	60.5	60	49.5	49	20	22-157/30	
50-32-8	Benzo(a)pyrene	ND	100	58.6	59	46.1	46	24	23-153/30	
205-99-2	Benzo(b)fluoranthene	ND	100	57.1	57	47.2	47	19	22-161/30	
191-24-2	Benzo(g,h,i)perylene	ND	100	62.4	62	55.4	55	12	20-158/30	
207-08-9	Benzo(k)fluoranthene	ND	100	51.4	51	42.0	42	20	17-161/30	
218-01-9	Chrysene	ND	100	51.4	51	42.4	42	19	16-159/30	
53-70-3	Dibenzo(a,h)anthracene	ND	100	72.2	72	62.8	63	14	21-154/30	
206-44-0	Fluoranthene	ND	100	62.2	62	48.8	49	24	16-140/30	
86-73-7	Fluorene	ND	100	60.9	61	51.2	51	17	15-153/30	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	100	68.1	68	60.6	60	12	21-159/30	
90-12-0	1-Methylnaphthalene	ND	100	51.2	51	44.9	45	13	10-148/30	
91-57-6	2-Methylnaphthalene	ND	100	80.7	81	73.6	73	9	10-181/30	
91-20-3	Naphthalene	ND	100	55.3	55	50.4	50	9	10-176/30	
85-01-8	Phenanthrene	ND	100	54.5	54	45.8	46	17	22-152/30	
129-00-0	Pyrene	ND	100	48.6	49	39.4	39	21	10-200/30	

CAS No.	Surrogate Recoveries	MS	MSD	D15048-2	Limits
4165-60-0	Nitrobenzene-d5	54%	50%	56%	10-193%
321-60-8	2-Fluorobiphenyl	54%	47%	52%	20-138%
1718-51-0	Terphenyl-d14	69%	57%	64%	17-174%

5.3.1
5



GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB315-MB	GB5771.D	1	07/11/10	DG	n/a	n/a	GGB315

The QC reported here applies to the following samples:

Method: SW846 8015B

D15048-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	20	20	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	121% 60-140%

Method Blank Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB318-MB	GB5827.D	1	07/13/10	DG	n/a	n/a	GGB318

The QC reported here applies to the following samples:

Method: SW846 8015B

D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	1.0	1.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	112% 60-140%

Method Blank Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTB315-MB	TB5771.D	1	07/11/10	DG	n/a	n/a	GTB315

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	100	100	ug/kg	
100-41-4	Ethylbenzene	ND	200	200	ug/kg	
108-88-3	Toluene	ND	200	200	ug/kg	
95-47-6	o-Xylene	ND	200	200	ug/kg	
	m,p-Xylene	ND	200	200	ug/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	116% 60-140%

Method Blank Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTB318-MB	TB5827.D	1	07/13/10	DG	n/a	n/a	GTB318

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	5.0	5.0	ug/kg	
100-41-4	Ethylbenzene	ND	10	10	ug/kg	
108-88-3	Toluene	ND	10	10	ug/kg	
95-47-6	o-Xylene	ND	10	10	ug/kg	
	m,p-Xylene	ND	10	10	ug/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	109% 60-140%

6.1.4
6

Blank Spike Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB315-BS	GB5772.D	1	07/11/10	DG	n/a	n/a	GGB315

The QC reported here applies to the following samples:

Method: SW846 8015B

D15048-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	220	221	100	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	106%	60-140%

6.2.1
6

Blank Spike Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB318-BS	GB5828.D	1	07/13/10	DG	n/a	n/a	GGB318

The QC reported here applies to the following samples:

Method: SW846 8015B

D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	11	9.64	88	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	103%	60-140%

Blank Spike Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTB315-BS	TB5772.D	1	07/11/10	DG	n/a	n/a	GTB315

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	2720	2640	97	70-130
100-41-4	Ethylbenzene	4560	4450	98	70-130
108-88-3	Toluene	21200	23100	109	70-130
95-47-6	o-Xylene	6590	6690	102	70-130
	m,p-Xylene	15000	16200	108	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	92%	60-140%

Blank Spike Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTB318-BS	TB5828.D	1	07/13/10	DG	n/a	n/a	GTB318

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	136	136	100	70-130
100-41-4	Ethylbenzene	228	225	99	70-130
108-88-3	Toluene	1060	1180	112	70-130
95-47-6	o-Xylene	330	344	104	70-130
	m,p-Xylene	750	816	109	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	110%	60-140%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14951-1MS	GB5774.D	1	07/11/10	DG	n/a	n/a	GGB315
D14951-1MSD	GB5775.D	1	07/11/10	DG	n/a	n/a	GGB315
D14951-1	GB5773.D	1	07/11/10	DG	n/a	n/a	GGB315

The QC reported here applies to the following samples:

Method: SW846 8015B

D15048-1

CAS No.	Compound	D14951-1 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	1010	665	1740	110	1670	99	4	62-130/30	

CAS No.	Surrogate Recoveries	MS	MSD	D14951-1	Limits
120-82-1	1,2,4-Trichlorobenzene	134%	120%	91%	60-140%

6.3.1
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D15048-3MS	GB5829.D	1	07/13/10	DG	n/a	n/a	GGB318
D15048-3MSD	GB5830.D	1	07/13/10	DG	n/a	n/a	GGB318
D15048-3	GB5832.D	1	07/13/10	DG	n/a	n/a	GGB318

The QC reported here applies to the following samples:

Method: SW846 8015B

D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	D15048-3 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	13.4	10.5	78	9.90	74	6	62-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D15048-3	Limits
120-82-1	1,2,4-Trichlorobenzene	103%	101%	100%	60-140%

6.3.2
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14951-1MS	TB5774.D	1	07/11/10	DG	n/a	n/a	GTB315
D14951-1MSD	TB5775.D	1	07/11/10	DG	n/a	n/a	GTB315
D14951-1	TB5773.D	1	07/11/10	DG	n/a	n/a	GTB315

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-1

CAS No.	Compound	D14951-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1790	8220	9780	97	9520	94	3	70-130/30
100-41-4	Ethylbenzene	14400	13800	29100	107	28100	99	3	62-130/30
95-47-6	o-Xylene	3530	19900	24600	106	23600	101	4	65-135/30
	m,p-Xylene	42900	45300	111000	150* a	106000	139	5	60-140/30

CAS No.	Surrogate Recoveries	MS	MSD	D14951-1	Limits
120-82-1	1,2,4-Trichlorobenzene	126%	109%	98%	60-140%

(a) Outside control limits due to matrix interference.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14951-1MS	TB5791.D	1	07/12/10	DG	n/a	n/a	GTB315
D14951-1MSD	TB5792.D	1	07/12/10	DG	n/a	n/a	GTB315
D14951-1	TB5773.D	1	07/11/10	DG	n/a	n/a	GTB315

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-1

CAS No.	Compound	D14951-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
108-88-3	Toluene	68600	320000	499000	135*	495000	133*	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D14951-1	Limits
120-82-1	1,2,4-Trichlorobenzene	144%*	123%	98%	60-140%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D15048-3MS	TB5829.D	1	07/13/10	DG	n/a	n/a	GTB318
D15048-3MSD	TB5830.D	1	07/13/10	DG	n/a	n/a	GTB318
D15048-3	TB5832.D	1	07/13/10	DG	n/a	n/a	GTB318

The QC reported here applies to the following samples:

Method: SW846 8021B

D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	D15048-3 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	166	147	88	152	91	3	70-130/30
100-41-4	Ethylbenzene	ND	279	243	87	246	88	1	62-130/30
108-88-3	Toluene	ND	1290	1260	97	1310	101	4	70-130/30
95-47-6	o-Xylene	ND	403	377	94	379	94	1	65-135/30
	m,p-Xylene	ND	917	895	98	909	99	2	60-140/30

CAS No.	Surrogate Recoveries	MS	MSD	D15048-3	Limits
120-82-1	1,2,4-Trichlorobenzene	108%	102%	105%	60-140%



GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2151-MB	FD2666.D	1	07/13/10	CP	07/12/10	OP2151	GFD136

The QC reported here applies to the following samples:

Method: SW846-8015B

D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	13	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	92% 63-130%

7.1.1
7

Blank Spike Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2151-BS	FD2667.D	1	07/13/10	CP	07/12/10	OP2151	GFD136

The QC reported here applies to the following samples:

Method: SW846-8015B

D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	747	112	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	105%	63-130%

7.2.1

7

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D15048
Account: WILLCOP Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2151-MS	FD2669.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
OP2151-MSD	FD2670.D	1	07/13/10	CP	07/12/10	OP2151	GFD136
D14909-1 ^a	FD2668.D	1	07/13/10	CP	07/12/10	OP2151	GFD136

The QC reported here applies to the following samples:

Method: SW846-8015B

D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

CAS No.	Compound	D14909-1 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	688	743	108	734	107	1	70-130/30	

CAS No.	Surrogate Recoveries	MS	MSD	D14909-1	Limits
84-15-1	o-Terphenyl	96%	95%	101%	63-130%

(a) Sample received outside the holding time.

7.3.1

7



Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 07/09/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.7	2		
Antimony	3.0	.17	.5		
Arsenic	2.5	.28	.72		
Barium	1.0	.014	.05	0.080	<1.0
Beryllium	1.0	.14	.21		
Boron	5.0	.35	.91		
Cadmium	1.0	.022	.12	0.030	<1.0
Calcium	40	1.7	2.7		
Chromium	1.0	.027	.18	0.050	<1.0
Cobalt	0.50	.048	.058		
Copper	0.50	.16	.38	0.15	<0.50
Iron	7.0	.77	.91		
Lead	5.0	.13	.24	0.050	<5.0
Lithium	0.20	.076	.09		
Magnesium	20	.58	.93		
Manganese	0.50	.021	.028		
Molybdenum	1.0	.041	.16		
Nickel	3.0	.038	.075	0.0	<3.0
Phosphorus	10	1.5	3.5		
Potassium	200	38	130		
Selenium	5.0	.28	.54	-0.15	<5.0
Silicon	5.0	1.2	.68		
Silver	3.0	.098	.068	0.10	<3.0
Sodium	40	23	6.3		
Strontium	5.0	.0091	.02		
Thallium	1.0	.31	.21		
Tin	5.0	1.4	.56		
Titanium	1.0	.0098	.041		
Uranium	5.0	.22	.53		
Vanadium	1.0	.027	.034		
Zinc	3.0	.076	.49	-0.20	<3.0

Associated samples MP2277: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

8.1.1

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 07/09/10

Metal	D15048-1 Original MS		SpikeLot MPICPALL % Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	502	604	201	50.7N(a) 75-125
Beryllium				
Boron				
Cadmium	0.17	43.3	50.3	85.8 75-125
Calcium				
Chromium	35.0	75.2	50.3	80.0 75-125
Cobalt				
Copper	13.0	58.7	50.3	90.9 75-125
Iron				
Lead	12.9	96.5	101	83.1 75-125
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	19.7	60.7	50.3	81.6 75-125
Phosphorus				
Potassium				
Selenium	2.1	88.6	101	86.0 75-125
Silicon				
Silver	0.30	18.3	20.1	89.5 75-125
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	41.1	80.2	50.3	77.8 75-125

Associated samples MP2277: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.12
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 07/09/10

Metal	D15048-1 Original MSD		SpikeLot MPICPAL % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	502	624	201	60.7N(a)	3.3	20
Beryllium						
Boron						
Cadmium	0.17	42.9	50.3	85.0	0.9	20
Calcium						
Chromium	35.0	77.9	50.3	85.3	3.5	20
Cobalt						
Copper	13.0	59.1	50.3	91.7	0.7	20
Iron						
Lead	12.9	95.2	101	81.9	1.4	20
Lithium						
Magnesium						
Manganese						
Molybdenum						
Nickel	19.7	60.5	50.3	81.2	0.3	20
Phosphorus						
Potassium						
Selenium	2.1	87.3	101	84.7	1.5	20
Silicon						
Silver	0.30	18.0	20.1	88.0	1.7	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	41.1	81.1	50.3	79.6	1.1	20

Associated samples MP2277: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.12
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 07/09/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	198	200	99.0	80-120
Beryllium				
Boron				
Cadmium	47.4	50	94.8	80-120
Calcium				
Chromium	50.9	50	101.8	80-120
Cobalt				
Copper	50.6	50	101.2	80-120
Iron				
Lead	96.5	100	96.5	80-120
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	48.4	50	96.8	80-120
Phosphorus				
Potassium				
Selenium	94.5	100	94.5	80-120
Silicon				
Silver	19.9	20	99.5	80-120
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	48.8	50	97.6	80-120

Associated samples MP2277: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.1.3
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

8.1.3

8

SERIAL DILUTION RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/09/10

Metal	D15048-1 Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	4990	5660	13.3*(a)	0-10
Beryllium				
Boron				
Cadmium	1.70	0.00	100.0(b)	0-10
Calcium				
Chromium	348	390	12.1*(a)	0-10
Cobalt				
Copper	129	136	5.6	0-10
Iron				
Lead	128	137	6.9	0-10
Lithium				
Magnesium				
Manganese				
Molybdenum				
Nickel	196	230	17.1*(a)	0-10
Phosphorus				
Potassium				
Selenium	20.5	28.0	36.6 (b)	0-10
Silicon				
Silver	3.00	5.00	66.7 (b)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	409	470	14.9*(a)	0-10

Associated samples MP2277: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.1.4
8

SERIAL DILUTION RESULTS SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2277
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

- (anr) Analyte not requested
- (a) Serial dilution indicates possible matrix interference.
- (b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2278
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 07/09/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	.89		
Antimony	0.20	.001	.045		
Arsenic	0.40	.049	.26	-0.033	<0.40
Barium	1.0	.0035	.17		
Beryllium	0.10	.0075	.014		
Boron	20	.97	2		
Cadmium	0.050	.023	.048		
Calcium	200	1.8	6.1		
Chromium	1.0	.021	.23		
Cobalt	0.10	.0033	.088		
Copper	1.0	.011	.14		
Iron	20	.81	6.1		
Lead	0.25	.0012	.18		
Magnesium	50	.067	1.3		
Manganese	0.50	.007	.089		
Molybdenum	0.50	.0044	.2		
Nickel	1.0	.0029	.074		
Phosphorus	30	1.8	5.6		
Potassium	100	2	9.1		
Selenium	0.20	.075	.14		
Silver	0.050	.0008	.029		
Sodium	250	.8	1.8		
Strontium	10	.004	.047		
Thallium	0.10	.015	.071		
Tin	5.0	.006	.17		
Titanium	1.0	.035	.071		
Uranium	0.25	.00038	.12		
Vanadium	2.0	.052	.99		
Zinc	5.0	.039	.53		

Associated samples MP2278: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

8.2.1
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2278
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/09/10

Metal	D15048-1 Original MS		Spike/lot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	4.0	87.9	101	83.4	60-119
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2278: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.2.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2278
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/09/10

Metal	D15048-1 Original MSD		SpikeLot MPICPAL % Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	4.0	90.2	101	85.7	2.6	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP2278: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.2.2
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2278
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/09/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	100	100	100.0	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2278: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

8.2.3
8

SERIAL DILUTION RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2278
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 07/09/10

Metal	D15048-1			QC
	Original	SDL 5:25	%DIF	Limits

Aluminum				
Antimony				
Arsenic	40.0	43.7	9.1	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2278: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

8.2.4
 8

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2290
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 07/12/10

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.10	.0011	.0012	-0.0052	<0.10

Associated samples MP2290: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

8.3.1
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2290
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 07/12/10

Metal	D15048-1 Original MS	Spike HGWSR1	lot % Rec	QC Limits
Mercury	0.010	0.45	0.519	84.8N(a) 85-115

Associated samples MP2290: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested
 (a) Spike recovery indicates possible matrix interference.

8.3.2
 8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2290
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 07/12/10

Metal	D15048-1 Original MSD	Spike HGWSR1	lot % Rec	MSD RPD	QC Limit
Mercury	0.010	0.43	0.489	85.8	4.5

Associated samples MP2290: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

8.3.2
 8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2290
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 07/12/10

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
Mercury	0.37	0.4	92.5	80-120

Associated samples MP2290: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

8.3.3
8

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/14/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	35	250		
Antimony	150	8.5	65		
Arsenic	130	14	33		
Barium	50	.7	12		
Beryllium	50	7	22		
Boron	250	18	93		
Cadmium	50	1.1	6		
Calcium	2000	85	46	21.0	<2000
Chromium	50	1.4	8		
Cobalt	25	2.4	1.5		
Copper	25	8	14		
Iron	350	39	50		
Lead	250	6.5	16		
Lithium	10	3.8	8		
Magnesium	1000	29	62	24.0	<1000
Manganese	25	1.1	3.5		
Molybdenum	50	2.1	6		
Nickel	150	1.9	3		
Phosphorus	500	75	270		
Potassium	5000	1900	2700		
Selenium	250	14	36		
Silicon	250	60	100		
Silver	150	4.9	1.5		
Sodium	2000	1200	110	499	<2000
Strontium	25	.46	17		
Thallium	50	16	11		
Tin	250	70	22		
Titanium	50	.49	3.5		
Uranium	250	11	20		
Vanadium	50	1.4	1.5		
Zinc	150	3.8	8.5		

Associated samples MP2311: D15048-1A, D15048-2A, D15048-3A, D15048-4A, D15048-5A, D15048-6A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

8.4.1

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/14/10

Metal	D15048-2A Original MS		SpikeLot MPICPAL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	20600	148000	125000	101.9	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	5170	128000	125000	98.3	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	57500	184000	125000	101.2	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2311: D15048-1A, D15048-2A, D15048-3A, D15048-4A, D15048-5A, D15048-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.4.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

8.4.2

8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/14/10

Metal	D15048-2A Original MSD		SpikeLot MPICPAL % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	20600	150000	125000	103.5	1.3	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	5170	129000	125000	99.1	0.8	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	57500	186000	125000	102.8	1.1	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP2311: D15048-1A, D15048-2A, D15048-3A, D15048-4A, D15048-5A, D15048-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.4.2
8

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

8.4.2

8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D15048
 Account: WILLCOP - Williams Production
 Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/14/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	130000	125000	104.0	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	131000	125000	104.8	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	135000	125000	108.0	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2311: D15048-1A, D15048-2A, D15048-3A, D15048-4A, D15048-5A, D15048-6A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

8.4.3
8

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

QC Batch ID: MP2311
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

8.4.3

8



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D15048
Account: WILLCOP - Williams Production
Project: TR 32-21-597-PT5021 Pit Closure

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP2342/GN5347			umhos/cm	9985	9970	99.8	90-110%
pH	GN5285			su	8.00	8.01	100.1	99.3-100.7%

Associated Samples:

Batch GN5285: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Batch GP2342: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

(*) Outside of QC limits



Misc. Forms

Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, Colorado 80033
TEL: 303-425-6021; 877-737-4521 FAX: 303-425-6854
www.accutest.com

FED-EX Tracking #
Bottle Order Control #
Accutest Quote #
Accutest Job # D15048

Client / Reporting Information
Project Information
Requested Analysis (see TEST CODE sheet)
Matrix Codes
Company Name: Accutest-MS
Project Name: TO: N.E.
Field ID / Point of Collection: D15048-01, -02, -03, -04, -05, -06
Date: 7/7/10
Time: 14:15, 14:30, 14:45, 15:30, 15:00
Matrix: SO
Number of preserved Bottles: 1
Turnaround Time: 3-5 Day RUSH
Approved By: (Accutest PMI) / Date: RUSH!
Level 1 = Results Only
Level 2 = Results + QC Summary + Case Narrative
Level 3 = Results + QC Summary + Partial Raw data
Level 4 = Full Deliverable
Sample Custody must be documented below each time samples change possession, including courier delivery.
Relinquished by: JR Date Time: 7/9/10 Received By: Fedx Date Time: 7/10/10 9:55 Received By: will add
Cooler Temp: 4.9°C

10.1 10

D15048: Chain of Custody
Page 1 of 2
Accutest Labs of New England, Inc.



Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D15048

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 7/10/2010 9:55:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XCRA

Airbill #'s: 798837078027

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared gun	
3. Cooler media:	Ice (bag)	

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

Empty box for comments.

Accutest Laboratories
V:508.481.6200

495 Technology Center West, Bldg One
F: 508.481.7753

Marlborough, MA
www.accutest.com

10.1
10



General Chemistry

QC Data Summaries

(Accutest Labs of New England, Inc.)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries



METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D15048
Account: ALMS - Accutest Mountain States
Project: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP11796/GN32358	2.0	0.0	mg/kg	40	41.2	103.0	80-120%
Chromium, Hexavalent	GP11796/GN32358			mg/kg	786	790	100.5	80-120%

Associated Samples:

Batch GP11796: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

(*) Outside of QC limits

11.1
11

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D15048
Account: ALMS - Accutest Mountain States
Project: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP11796/GN32358	D14946-1	mg/kg	0.0	0.0	0.0	0-20%
Redox Potential Vs H2	GN32374	D15048-2	mv	330	335	1.5	0-20%

Associated Samples:

Batch GN32374: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

Batch GP11796: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D15048
Account: ALMS - Accutest Mountain States
Project: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP11796/GN32358	D14946-1	mg/kg	0.0	42.8	43.3	101.1	75-125%
Chromium, Hexavalent	GP11796/GN32358	D14946-1	mg/kg	0.0	1010	1090	107.9	75-125%

Associated Samples:

Batch GP11796: D15048-1, D15048-2, D15048-3, D15048-4, D15048-5, D15048-6

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

11.3
11

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Appendix 2: Post Excavation Raw Analytical

Report of Analysis

Client Sample ID: TR 32-21-597_PT5021_NB	
Lab Sample ID: D15330-1	Date Sampled: 07/12/10
Matrix: SO - Soil	Date Received: 07/19/10
Method: SW846-8015B SW846 3550B	Percent Solids: 78.1
Project: TR 32-21-597_PT5021 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE3320.D	1	07/20/10	EH	07/20/10	OP2190	GFE200
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	75.1	17	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	102%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WW	
Lab Sample ID:	D15388-1	Date Sampled: 07/20/10
Matrix:	SO - Soil	Date Received: 07/21/10
Method:	SW846-8015B SW846 3550B	Percent Solids: 83.2
Project:	TR 32-21-597-PT5021 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2855.D	1	07/22/10	CP	07/21/10	OP2198	GFD140
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	16	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	80%		63-130%	

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WB	Date Sampled:	07/20/10
Lab Sample ID:	D15388-2	Date Received:	07/21/10
Matrix:	SO - Soil	Percent Solids:	79.9
Method:	SW846 8260B		
Project:	TR 32-21-597-PT5021 Pit Closure		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V05919.D	1	07/22/10	DC	n/a	n/a	V3V308
Run #2							

	Initial Weight
Run #1	1.00 g
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	6.3	1.9	ug/kg	
108-88-3	Toluene	ND	13	6.3	ug/kg	
100-41-4	Ethylbenzene	ND	13	2.5	ug/kg	
	m,p-Xylene	ND	25	4.4	ug/kg	
95-47-6	o-Xylene	ND	13	4.4	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	87%		70-130%
460-00-4	4-Bromofluorobenzene	81%		70-130%
17060-07-0	1,2-Dichloroethane-D4	84%		70-130%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WB	Date Sampled:	07/20/10
Lab Sample ID:	D15388-2	Date Received:	07/21/10
Matrix:	SO - Soil	Percent Solids:	79.9
Method:	SW846 8270C BY SIM SW846 3540C		
Project:	TR 32-21-597-PT5021 Pit Closure		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G01526.D	2	07/22/10	TMB	07/21/10	OP2201	E3G41
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	17	16	ug/kg	
208-96-8	Acenaphthylene	ND	83	17	ug/kg	
120-12-7	Anthracene	ND	17	11	ug/kg	
56-55-3	Benzo(a)anthracene	ND	17	16	ug/kg	
50-32-8	Benzo(a)pyrene	ND	17	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	17	12	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	17	10	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	17	10	ug/kg	
218-01-9	Chrysene	ND	17	8.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	17	12	ug/kg	
206-44-0	Fluoranthene	ND	17	10	ug/kg	
86-73-7	Fluorene	20.0	17	16	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	17	11	ug/kg	
90-12-0	1-Methylnaphthalene	31.0	17	15	ug/kg	
91-57-6	2-Methylnaphthalene	30.8	83	25	ug/kg	J
91-20-3	Naphthalene	ND	83	18	ug/kg	
85-01-8	Phenanthrene	ND	17	13	ug/kg	
129-00-0	Pyrene	ND	17	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	59%		10-193%
321-60-8	2-Fluorobiphenyl	62%		20-138%
1718-51-0	Terphenyl-d14	60%		17-174%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WB	Date Sampled:	07/20/10
Lab Sample ID:	D15388-2	Date Received:	07/21/10
Matrix:	SO - Soil	Percent Solids:	79.9
Project:	TR 32-21-597-PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	2.9	0.50	mg/kg	5	07/21/10	07/22/10 JM	SW846 6020 ¹	SW846 3050B ⁵
Barium	353	1.2	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Cadmium	< 1.2	1.2	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Chromium	32.4	1.2	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Copper	15.3	0.62	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Lead	12.9	6.2	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Mercury	< 0.12	0.12	mg/kg	1	07/23/10	07/23/10 RN	SW846 7471A ³	SW846 7471A ⁶
Nickel	18.0	3.7	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Selenium	< 6.2	6.2	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Silver	< 3.7	3.7	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴
Zinc	44.7	3.7	mg/kg	1	07/21/10	07/22/10 JM	SW846 6010B ²	SW846 3050B ⁴

(1) Instrument QC Batch: MA843

(2) Instrument QC Batch: MA844

(3) Instrument QC Batch: MA847

(4) Prep QC Batch: MP2375

(5) Prep QC Batch: MP2376

(6) Prep QC Batch: MP2402

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WB	Date Sampled:	07/20/10
Lab Sample ID:	D15388-2	Date Received:	07/21/10
Matrix:	SO - Soil	Percent Solids:	79.9
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent ^a	< 2.5	2.5	mg/kg	1	07/22/10 17:45	AMA	SW846 3060A/7196A
Chromium, Trivalent ^b	32.1	3.7	mg/kg	1	07/22/10 20:21	JM	SW846 3060/7196A M
Redox Potential Vs H2 ^a	298		mv	1	07/23/10	AMA	ASTM E1498-76M
Solids, Percent	79.9		%	1	07/21/10	CJ	SM19 2540B M
Specific Conductivity	4000	1.0	umhos/cm	1	07/23/10	JK	DEPT.OF AG, BOOK N9
pH	8.33		su	1	07/21/10 10:20	CJ	SW846 9045C

(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

(b) Calculated as: (Chromium) - (Chromium, Hexavalent)

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WB	Date Sampled:	07/20/10
Lab Sample ID:	D15388-2A	Date Received:	07/21/10
Matrix:	SO - Soil	Percent Solids:	79.9
Project:	TR 32-21-597-PT5021 Pit Closure		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	346	2.0	mg/l	1	07/22/10	07/23/10 JM	SW846 6010B ¹	EPA 200.7 ²
Magnesium	93.5	1.0	mg/l	1	07/22/10	07/23/10 JM	SW846 6010B ¹	EPA 200.7 ²
Sodium	345	2.0	mg/l	1	07/22/10	07/23/10 JM	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA844

(2) Prep QC Batch: MP2397

Report of Analysis

Client Sample ID:	TR 32-21-597-PT5021-WB	Date Sampled:	07/20/10
Lab Sample ID:	D15388-2A	Date Received:	07/21/10
Matrix:	SO - Soil	Percent Solids:	79.9
Project:	TR 32-21-597-PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	4.25		ratio	1	07/23/10 04:04	JM	LADNR29B

(a) Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

RL = Reporting Limit



Technical Report for

Accutest Mountain States

WILLCOP: TR 32-21-597-PT5021 Pit Closure

WILLCOP3735

Accutest Job Number: D15388

Sampling Date: 07/20/10

Report to:

Total number of pages in report: **9**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Laurie Glantz-Murphy
Laboratory Director

Client Service contact: Laurie Glantz-Murphy 408-588-0200

Certifications: CA (08258CA) DoD/ISO/IEC 17025:2005 (L2242)

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Test results relate only to samples analyzed.



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Sample Summary

Accutest Mountain States

Job No: D15388

WILLCOP: TR 32-21-597-PT5021 Pit Closure

Project No: WILLCOP3735

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
D15388-2B	07/20/10	11:30 KR	07/21/10	SO	Soil	TR 32-21-597-PT5021-WB

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Accutest Mountain States

Job No D15388

Site: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Report Date 7/27/2010 3:09:19 PM

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 07/20/2010 and were received at Accutest on 07/21/2010 properly preserved and intact, unless noted below. These Samples received an Accutest job number of D15388. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Extractables by GC By Method SW846 8015B M

Matrix SO

Batch ID: OP2448

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- D15388-2B: Reporting Limit increased due to high moisture in the sample. 5 grams prepared instead of the standard 10 grams.

Accutest Laboratories Northern California (ALNCA) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALNCA and as stated on the COC. ALNCA certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALNCA Quality Manual except as noted above. This report is to be used in its entirety. ALNCA is not responsible for any assumptions of data quality if partial data packages are used



Sample Results

Report of Analysis

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597-PT5021-WB	Date Sampled: 07/20/10
Lab Sample ID: D15388-2B	Date Received: 07/21/10
Matrix: SO - Soil	Percent Solids: 79.9
Method: SW846 8015B M SW846 3545A	
Project: WILLCOP: TR 32-21-597-PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	HH7518.D	1	07/27/10	JH	07/27/10	OP2448	GHH321
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.10 g	1.0 ml
Run #2		

TPH Extractable

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	17.0	25	12	mg/kg	J
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
630-01-3	Hexacosane	61%		45-140%		

(a) Reporting Limit increased due to high moisture in the sample. 5grams prepared instead of the standard 10grams.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound



GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D15388
Account: ALMS Accutest Mountain States
Project: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2448-MB	HH7515.D	1	07/27/10	JH	07/26/10	OP2448	GHH321

The QC reported here applies to the following samples:

Method: SW846 8015B M

D15388-2B

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
630-01-3	Hexacosane	69% 45-140%

4.1.1
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Blank Spike/Blank Spike Duplicate Summary

Job Number: D15388
Account: ALMS Accutest Mountain States
Project: WILLCOP: TR 32-21-597-PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2448-BS	HH7516.D	1	07/27/10	JH	07/26/10	OP2448	GHH321
OP2448-BSD	HH7517.D	1	07/27/10	JH	07/26/10	OP2448	GHH321

The QC reported here applies to the following samples:

Method: SW846 8015B M

D15388-2B

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	BSD mg/kg	BSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	100	52.1	52	59.8	60	14	45-140/30

CAS No.	Surrogate Recoveries	BSP	BSD	Limits
630-01-3	Hexacosane	58%	67%	45-140%

4.2.1
4

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Appendix 3: Background Sample Raw Analytical



Technical Report for

HRL Compliance Solutions

TR 32-21-597_PT5021 Pit Closure

Accutest Job Number: D14885

Sampling Date: 07/01/10

Report to:

HRL Compliance Solutions
744 Horizon Court #140
Grand Junction, CO 81506
hlucero@hrlcomp.com

ATTN: Herman Lucero

Total number of pages in report: **46**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Jesse L. Smith
Laboratory Director

Client Service contact: Shea Greiner 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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Test results relate only to samples analyzed.



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Sample Summary

HRL Compliance Solutions

Job No: D14885

TR 32-21-597_PT5021 Pit Closure

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
D14885-1	07/01/10	10:15 KR	07/02/10	SO	Soil	TR 32-21-597_PT5021_PC
D14885-2	07/01/10	11:00 KR	07/02/10	SO	Soil	TR 32-21-597_PT5021_BKGD1
D14885-3	07/01/10	11:15 KR	07/02/10	SO	Soil	TR 32-21-597_PT5021_BKGD2
D14885-3A	07/01/10	11:15 KR	07/02/10	SO	Soil	TR 32-21-597_PT5021_BKGD2
D14885-4	07/01/10	11:30 KR	07/02/10	SO	Soil	TR 32-21-597_PT5021_BKGD3

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: HRL Compliance Solutions

Job No D14885

Site: TR 32-21-597_PT5021 Pit Closure

Report Dat 7/12/2010 5:16:19 PM

On 07/02/2010, four (4) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 3.0°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D14885 was assigned to the project. The lab sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Volatiles by GC By Method SW846 8015B

Matrix SO	Batch ID: GGB309
------------------	-------------------------

- All samples were analyzed within the recommended method holding time.
- Samples D14904-4MS and D14904-4MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Sample D14904-4MS has the surrogate outside control limits due to coeluting interference. This does not affect the analysis of the target analytes, which elute before the interference.

Volatiles by GC By Method SW846 8021B

Matrix LEACHATE	Batch ID: OP2145
------------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample D14885-1MS has the surrogate outside control limits due to coeluting interference. This does not affect the analysis of the target analytes, which elute before the interference.

Extractables by GC By Method SW846-8015B

Matrix SO	Batch ID: OP2135
------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D14846-5MS and D14846-5MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- Sample D14885-1 has the surrogate outside control limits due to dilution.

Metals By Method SW846 6010B

Matrix AQ	Batch ID: MP2263
------------------	-------------------------

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D14849-2AMS and D14849-2AMSD were used as the QC samples for the metals analysis.

Metals By Method SW846 6020

Matrix SO **Batch ID:** MP2265

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D14886-1MS, D14886-1MSD, and D14886-1SDL were used as the QC samples for the metals analysis.
- The serial dilution RPD for Arsenic is outside control limits for sample MP2265-SD1. The percent difference is acceptable due to low initial sample concentration (< 50 times IDL).

Wet Chemistry By Method LADNR29B

Matrix SO **Batch ID:** R3136

- The data for LADNR29B meets quality control requirements.
- Sodium Adsorption Ratio: Calculated as: $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

Wet Chemistry By Method SM19 2540B M

Matrix SO **Batch ID:** GN5213

- The data for SM19 2540B M meets quality control requirements.

Wet Chemistry By Method SW846 1010, PM CC

Matrix ALL **Batch ID:** GN5272

- The data for SW846 1010, PM CC meets quality control requirements.
- D14885-1 for Flashpoint At 620 mm Hg: Ignitable

Wet Chemistry By Method SW846 7.2

Matrix SO **Batch ID:** GN5184

- D14885-1 for Corrosivity as pH: Non Corrosive

Wet Chemistry By Method SW846 9095

Matrix SO **Batch ID:** GN5267

- The data for SW846 9095 meets quality control requirements.
- D14885-1 for Paint Filter Test: No free liquids.

Wet Chemistry By Method SW846 CHAP 7.3

Matrix SO **Batch ID:** GP2293

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Wet Chemistry By Method SW846 CHAP7

Matrix SO **Batch ID:** GP2294

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.



Sample Results

Report of Analysis

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597_PT5021_PC	Date Sampled: 07/01/10
Lab Sample ID: D14885-1	Date Received: 07/02/10
Matrix: SO - Soil	Percent Solids: 75.1
Method: SW846 8015B	
Project: TR 32-21-597_PT5021 Pit Closure	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB5693.D	1	07/09/10	DG	n/a	n/a	GGB309
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	10.0 ml	10.0 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	4590	300	300	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	100%		60-140%		

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597_PT5021_PC	Date Sampled: 07/01/10
Lab Sample ID: D14885-1	Date Received: 07/02/10
Matrix: SO - Soil	Percent Solids: 75.1
Method: SW846 8021B SW846 1311	
Project: TR 32-21-597_PT5021 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA7601.D	10	07/09/10	DG	07/09/10	OP2145	GTA449
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

TCLP Leachate method SW846 1311

CAS No.	Compound	Result	HW#	MCL	RL	MDL	Units	Q
71-43-2	Benzene	0.0574	D018	0.50	0.010	0.010	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	138%		60-140%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
 MCL = Maximum Contamination Level (40 CFR 261 6/96) B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

3.1
3

Client Sample ID: TR 32-21-597_PT5021_PC	Date Sampled: 07/01/10
Lab Sample ID: D14885-1	Date Received: 07/02/10
Matrix: SO - Soil	Percent Solids: 75.1
Method: SW846-8015B SW846 3550B	
Project: TR 32-21-597_PT5021 Pit Closure	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD2619.D	100	07/09/10	CP	07/07/10	OP2135	GFD135
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	7.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	146000	6200	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	771% ^a		63-130%	

(a) Outside control limits due to dilution.

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	TR 32-21-597_PT5021_PC	Date Sampled:	07/01/10
Lab Sample ID:	D14885-1	Date Received:	07/02/10
Matrix:	SO - Soil	Percent Solids:	75.1
Project:	TR 32-21-597_PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Corrosivity as pH ^a	7.45		su	1	07/02/10 13:55	CJ	SW846 7.2
Cyanide Reactivity	< 1.5	1.5	mg/kg	1	07/06/10	JD	SW846 CHAP7
Flashpoint At 620 mm Hg ^b	90		Deg. F	1	07/09/10	JK	SW846 1010, PM CC
Paint Filter Test ^c	< 1.0	1.0	ml/100g	1	07/09/10	JD	SW846 9095
Solids, Percent	75.1		%	1	07/06/10	JK	SM19 2540B M
Sulfide Reactivity	10.0	10	mg/kg	1	07/06/10	JD	SW846 CHAP 7.3

- (a) Non Corrosive
- (b) Ignitable
- (c) No free liquids.

RL = Reporting Limit

Report of Analysis

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Client Sample ID: TR 32-21-597_PT5021_BKGD1	Date Sampled: 07/01/10
Lab Sample ID: D14885-2	Date Received: 07/02/10
Matrix: SO - Soil	Percent Solids: 93.5
Project: TR 32-21-597_PT5021 Pit Closure	

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.9	0.33	mg/kg	5	07/08/10	07/08/10 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA809

(2) Prep QC Batch: MP2265

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597_PT5021_BKGD2	Date Sampled:	07/01/10
Lab Sample ID:	D14885-3	Date Received:	07/02/10
Matrix:	SO - Soil	Percent Solids:	95.3
Project:	TR 32-21-597_PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.4	0.31	mg/kg	5	07/08/10	07/08/10 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA809

(2) Prep QC Batch: MP2265

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597_PT5021_BKGD2	Date Sampled:	07/01/10
Lab Sample ID:	D14885-3	Date Received:	07/02/10
Matrix:	SO - Soil	Percent Solids:	95.3
Project:	TR 32-21-597_PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	95.3		%	1	07/06/10	JK	SM19 2540B M
Specific Conductivity	284	1.0	umhos/cm	1	07/07/10	JD	DEPT.OF AG, BOOK N9
pH	7.18		su	1	07/02/10 13:55	CJ	SW846 9045C

RL = Reporting Limit

Report of Analysis

3.4
3

Client Sample ID: TR 32-21-597_PT5021_BKGD2	Date Sampled: 07/01/10
Lab Sample ID: D14885-3A	Date Received: 07/02/10
Matrix: SO - Soil	Percent Solids: 95.3
Project: TR 32-21-597_PT5021 Pit Closure	

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	24.5	2.0	mg/l	1	07/07/10	07/08/10 SH	SW846 6010B ¹	EPA 200.7 ²
Magnesium	5.18	1.0	mg/l	1	07/07/10	07/08/10 SH	SW846 6010B ¹	EPA 200.7 ²
Sodium	24.7	2.0	mg/l	1	07/07/10	07/08/10 SH	SW846 6010B ¹	EPA 200.7 ²

(1) Instrument QC Batch: MA806

(2) Prep QC Batch: MP2263

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597_PT5021_BKGD2	Date Sampled:	07/01/10
Lab Sample ID:	D14885-3A	Date Received:	07/02/10
Matrix:	SO - Soil	Percent Solids:	95.3
Project:	TR 32-21-597_PT5021 Pit Closure		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	1.18		ratio	1	07/08/10 03:21	SH	LADNR29B

(a) Calculated as: $(Na \text{ meq/L}) / \sqrt{[(Ca \text{ meq/L}) + (Mg \text{ meq/L})/2]}$

RL = Reporting Limit

Report of Analysis

Client Sample ID:	TR 32-21-597_PT5021_BKGD3	Date Sampled:	07/01/10
Lab Sample ID:	D14885-4	Date Received:	07/02/10
Matrix:	SO - Soil	Percent Solids:	93.9
Project:	TR 32-21-597_PT5021 Pit Closure		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	3.3	0.31	mg/kg	5	07/08/10	07/08/10 GJ	SW846 6020 ¹	SW846 3050B ²

(1) Instrument QC Batch: MA809

(2) Prep QC Batch: MP2265

RL = Reporting Limit



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



GC Volatiles

5

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB309-MB	GB5686.D	1	07/09/10	DG	n/a	n/a	GGB309

The QC reported here applies to the following samples:

Method: SW846 8015B

D14885-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	20	20	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	122% 60-140%

5.1.1
5

Method Blank Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2145-MB	TA7599.D	10	07/09/10	DG	07/09/10	OP2145	GTA449

The QC reported here applies to the following samples:

Method: SW846 8021B

D14885-1

CAS No.	Compound	Result	RL	Units	Q
71-43-2	Benzene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	112% 60-140%

5.1.2
5

Blank Spike Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB309-BS	GB5687.D	1	07/09/10	DG	n/a	n/a	GGB309

The QC reported here applies to the following samples:

Method: SW846 8015B

D14885-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	220	226	103	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	134%	60-140%

5.2.1
5

Blank Spike Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2145-BSP	TA7600.D	10	07/09/10	DG	07/09/10	OP2145	GTA449

The QC reported here applies to the following samples:

Method: SW846 8021B

D14885-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	272	284	104	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	124%	60-140%

5.2.2
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14904-4MS	GB5690.D	1	07/09/10	DG	n/a	n/a	GGB309
D14904-4MSD	GB5691.D	1	07/09/10	DG	n/a	n/a	GGB309
D14904-4	GB5688.D	1	07/09/10	DG	n/a	n/a	GGB309

The QC reported here applies to the following samples:

Method: SW846 8015B

D14885-1

CAS No.	Compound	D14904-4 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	344	321	704	112	694	109	1	62-130/30	

CAS No.	Surrogate Recoveries	MS	MSD	D14904-4	Limits
120-82-1	1,2,4-Trichlorobenzene	314%* a	137%	304%* a	60-140%

(a) Outside control limits due to matrix interference.

5.3.1
5

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D14885-1MS	TA7602.D	10	07/09/10	DG	n/a	n/a	GTA449
D14885-1MSD	TA7603.D	10	07/09/10	DG	n/a	n/a	GTA449
D14885-1	TA7601.D	10	07/09/10	DG	07/09/10	OP2145	GTA449

The QC reported here applies to the following samples:

Method: SW846 8021B

D14885-1

CAS No.	Compound	D14885-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	57.4	272	344	105	341	104	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D14885-1	Limits
120-82-1	1,2,4-Trichlorobenzene	170%* a	95%	138%	60-140%

(a) Outside control limits due to matrix interference.

5.3.2
5



GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2135-MB	FD2597.D	1	07/08/10	CP	07/07/10	OP2135	GFD134

The QC reported here applies to the following samples:

Method: SW846-8015B

D14885-1

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	13	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	90% 63-130%

6.1.1

6

Blank Spike Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2135-BS	FD2598.D	1	07/08/10	CP	07/07/10	OP2135	GFD134

The QC reported here applies to the following samples:

Method: SW846-8015B

D14885-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	722	108	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	95%	63-130%

6.2.1
6

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D14885
Account: HRLCCOGJ HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2135-MS	FD2600.D	1	07/08/10	CP	07/07/10	OP2135	GFD134
OP2135-MSD	FD2601.D	1	07/08/10	CP	07/07/10	OP2135	GFD134
D14846-5	FD2599.D	1	07/08/10	CP	07/07/10	OP2135	GFD134

The QC reported here applies to the following samples:

Method: SW846-8015B

D14885-1

CAS No.	Compound	D14846-5 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	245	688	1130	129	1040	116	8	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D14846-5	Limits
84-15-1	o-Terphenyl	93%	87%	68%	63-130%

6.3.1
6



Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 07/07/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	35	250		
Antimony	150	8.5	65		
Arsenic	130	14	33		
Barium	50	.7	12		
Beryllium	50	7	22		
Boron	250	18	93		
Cadmium	50	1.1	6		
Calcium	2000	85	46	-16	<2000
Chromium	50	1.4	8		
Cobalt	25	2.4	1.5		
Copper	25	8	14		
Iron	350	39	50		
Lead	250	6.5	16		
Lithium	10	3.8	8		
Magnesium	1000	29	62	22.0	<1000
Manganese	25	1.1	3.5		
Molybdenum	50	2.1	6		
Nickel	150	1.9	3		
Phosphorus	500	75	270		
Potassium	5000	1900	2700		
Selenium	250	14	36		
Silicon	250	60	100		
Silver	150	4.9	1.5		
Sodium	2000	1200	110	-120	<2000
Strontium	25	.46	17		
Thallium	50	16	11		
Tin	250	70	22		
Titanium	50	.49	3.5		
Uranium	250	11	20		
Vanadium	50	1.4	1.5		
Zinc	150	3.8	8.5		

Associated samples MP2263: D14885-3A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

7.1.1
7

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

7.1.1

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/07/10

Metal	D14849-2A Original MS		SpikeLot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	24300	149000	125000	99.8	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	92500	217000	125000	99.6	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	258000	384000	125000	100.8	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2263: D14885-3A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

7.1.2
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/07/10

Metal	D14849-2A Original MSD		SpikeLot MPICPALL % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	24300	152000	125000	102.2	2.0	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	92500	222000	125000	103.6	2.3	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	258000	387000	125000	103.2	0.8	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP2263: D14885-3A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

7.1.2
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
 Matrix Type: AQUEOUS

Methods: SW846 6010B
 Units: ug/l

Prep Date: 07/07/10

Metal	BSP Result	SpikeLot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	128000	125000	102.4	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	120000	125000	96.0	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	124000	125000	99.2	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2263: D14885-3A

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits

7.1.3
7

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2263
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2265
Matrix Type: SOLID

Methods: SW846 6020
Units: mg/kg

Prep Date: 07/08/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.14	.89		
Antimony	0.20	.001	.045		
Arsenic	0.40	.049	.26	-0.20	<0.40
Barium	1.0	.0035	.17		
Beryllium	0.10	.0075	.014		
Boron	20	.97	2		
Cadmium	0.050	.023	.048		
Calcium	200	1.8	6.1		
Chromium	1.0	.021	.23		
Cobalt	0.10	.0033	.088		
Copper	1.0	.011	.14		
Iron	20	.81	6.1		
Lead	0.25	.0012	.18		
Magnesium	50	.067	1.3		
Manganese	0.50	.007	.089		
Molybdenum	0.50	.0044	.2		
Nickel	1.0	.0029	.074		
Phosphorus	30	1.8	5.6		
Potassium	100	2	9.1		
Selenium	0.20	.075	.14		
Silver	0.050	.0008	.029		
Sodium	250	.8	1.8		
Strontium	10	.004	.047		
Thallium	0.10	.015	.071		
Tin	5.0	.006	.17		
Titanium	1.0	.035	.071		
Uranium	0.25	.00038	.12		
Vanadium	2.0	.052	.99		
Zinc	5.0	.039	.53		

Associated samples MP2265: D14885-2, D14885-3, D14885-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

7.2.1
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2265
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/08/10

Metal	D14886-1 Original MS		Spike/lot MPICPALL % Rec		QC Limits
Aluminum					
Antimony					
Arsenic	2.9	128	134	93.1	60-119
Barium					
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP2265: D14885-2, D14885-3, D14885-4

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

7.2.2
7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2265
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/08/10

Metal	D14886-1 Original MSD		SpikeLot MPICPALL % Rec	MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	2.9	127	134	92.3	0.8	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP2265: D14885-2, D14885-3, D14885-4

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

7.2.2
7

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2265
 Matrix Type: SOLID

Methods: SW846 6020
 Units: mg/kg

Prep Date: 07/08/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	89.9	100	89.9	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2265: D14885-2, D14885-3, D14885-4

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

7.2.3
7

SERIAL DILUTION RESULTS SUMMARY

Login Number: D14885
 Account: HRLCCOGJ - HRL Compliance Solutions
 Project: TR 32-21-597_PT5021 Pit Closure

QC Batch ID: MP2265
 Matrix Type: SOLID

Methods: SW846 6020
 Units: ug/l

Prep Date: 07/08/10

Metal	D14886-1	QC
	Original	Limits

Metal	Original	SDL	5:25 %DIF	QC Limits
Aluminum				
Antimony				
Arsenic	21.3	25.7	20.5 (a)	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP2265: D14885-2, D14885-3, D14885-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

7.2.4
7



General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D14885
Account: HRLCCOGJ - HRL Compliance Solutions
Project: TR 32-21-597_PT5021 Pit Closure

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Corrosivity as pH	GN5184			su	8.00	8.02	100.3	99.3-100.7%
Cyanide Reactivity	GP2294/GN5204	1.5	0.0	mg/kg	13.6	0.0	0.1	0-100%
Specific Conductivity	GP2303/GN5236			umhos/cm	9985	9920	99.3	90-110%
Sulfide Reactivity	GP2293/GN5203	10	0.0	mg/kg	65	50.0	76.9	50-150%
pH	GN5183			su	8.00	8.02	100.3	99.3-100.7%

Associated Samples:

Batch GN5183: D14885-3
Batch GN5184: D14885-1
Batch GP2293: D14885-1
Batch GP2294: D14885-1
Batch GP2303: D14885-3
(*) Outside of QC limits

8.1

8

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Appendix 4: Rio Blanco County (KRW Consulting) Special Waste Profile and Sampling Criteria

- E) The laboratory lists which will generally be required for various special wastes are listed below. These general requirements are subject to change at Rio Blanco County's discretion and specific waste streams may require more or less testing.
- 1) Soil or other material contaminated by petroleum products from above or below ground releases:
 - a) For Gasoline:
Paint Filter Test, BTEX, Ignitability, TCLP or Total Lead, TVH
 - b) For Diesel Fuel, Jet Fuel, or Fuel Oil:
Paint Filter Test, TEPH, Ignitability, and TCLP Benzene (If appropriate, TCLP, Cadmium, Chromium, and Lead will also be tested)
 - c) For Used Motor Oil:
Paint Filter Test, TEPH, Ignitability, TCLP Metals, TCLP Semi-Volatile and Volatile Organics, PCBs, and Reactivity
 - 2) Municipal Solid Waste Ash or other Types of Ash
Paint Filter Test, pH, Reactivity, TCLP Metals, Total Organic Halogens, Gross Alpha and Beta Radionuclides
 - 3) Wastes of Known Origin but Uncertain Composition (Municipal and Industrial Waste Water Treatment Sludges, Filter Cakes, etc.)
Paint Filter Test, pH, Ignitability, Reactivity, TCLP Metals, TCLP Semi-Volatile and Volatile Organics, Percent Solids, Oil and Grease, and PCBs
 - 4) Wastes of Uncertain Composition or Origin (site cleanup wastes, unclassified spills, unlabeled containers, etc.)
Paint Filter Test, pH, Ignitability, Reactivity, TCLP Metals, TCLP Volatile and Semi-Volatile Organics, and PCBs
- F) Samples submitted for the required waste characterization shall be representative of the waste material to be disposed of at the disposal facility. A completed Special Waste Characterization form will be required when submitting the respective laboratory analyses.
- G) Samples shall be submitted to a laboratory qualified to conduct the required testing.
- H) After completion of the laboratory analyses, the following shall be submitted to Rio Blanco County at the intended disposal facility:
- 1) Analytical Results; and
 - 2) Special Waste Characterization form.

Forms for Special Waste Characterization are attached.

- I) As defined in the Colorado State Solid Waste Regulations - no facility may accept liquid wastes or wastes containing free liquids (as determined by Paint Filter Liquid Test - EPA Method 9095) unless the facility is specifically designed to do so. The Rio Blanco County Landfill Design, Operations, and Closure Plans (Wray Gulch and Rangely Landfills) presently do not include provisions for acceptance of wastes that fail the free liquids test.
- J) Non-friable asbestos will be considered for acceptance into the Rio Blanco County Landfill facilities. Non-friable asbestos that has been processed, handled, or used in such a way that asbestos fibers may be freely released will not be accepted. Determination of whether an asbestos containing material is

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Appendix 5: HighPlains Pit Liner Recycling Manifest

**Williams Production RMT Company
Pit liner and Related Materials Recovery and Recycling Program
Recycle Material Manifest**

1.0 Generator Information:

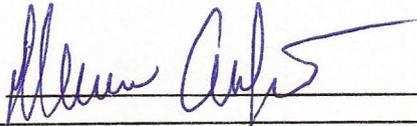
1.1 Generator's Name and Mailing Address: Williams Production Company RMT Piceance Highlands and Valley Asset Teams 1058 County Road 215 Parachute, CO 81635 Generator's Phone: 970-285-9377	1.2 Manifest Tracking Number: WPC TR 31-21-597
	1.3 Generator's Site or Facility Name: TR 31-21-597
1.4 Recovery Company Name and Mailing Address: High Plains Services, Inc. 2966 D Road Grand Junction, CO. 81504	1.5 Date of Material Recovery: 7/29/2010
	1.6 Pit ID Number: PT5080

2.0 Pit Liner Recovery and Material Acceptance Criteria:

2.1 Has all excess dirt been removed from pit liner?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2.2 Has all rock been removed from pit liner?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2.3 Has all, if any, oil and condensate been removed from pit liner?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2.4 Has the pit liner been segregated from the nonwoven materials?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2.5 Has the pit liner been cut into manageable strips?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2.6 Has the pit liner material been strapped to pallet for transport?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
2.7 Will the pit liners require additional cleaning to meet recycling criteria?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> NA
2.8 Were photographs taken during the pit liner recovery process?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> NA
2.9 Are MSDS attached for recovered pit liner materials?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> NA

Additional Comments/Discrepancies:

Inspector's Signature:



Date:

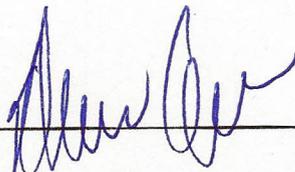
7/29/2010

3.0 Materials Inventory for Transport to Recycle and Reuse Repository:

1.	3.1 Inventory Description (includes Client Code, Pallet or Bale ID Code, Bale Date, Pit ID #, and Bale #)	3.2 Material Weight or Volume	3.3 Containers Type	3.4 REC Codes		
				PO5	R006	GEO
1.	WPC TR 31-21-597, 7/27/10, PT5080, Bale # 256	800 LBS.	CO2	PO5	R006	GEO
2.	WPC TR 31-21-597, 7/27/10, PT5080, Bale # 257	800 LBS.	CO2	PO5	R006	GEO
3.	WPC TR 31-21-597, 7/27/10, PT5080, Bale # 258	800 LBS.	CO2	PO5	R001	ARS
4.	WPC TR 31-21-597, 7/27/10, PT5080, Bale # 259	800 LBS.	CO2	PO5	R006	GEO
5.	WPC TR 31-21-597, 7/27/10, PT5080, Bale # 260	800 LBS.	CO2	PO5	R001	ARS
6.	WPC TR 31-21-597, 7/27/10, PT5080, Bale #261	800 LBS.	CO2	PO5	R003	GEO

Additional Comments/Discrepancies:

Transporter's Signature:



Date:

7/29/10

Facility Name: TR 31-21-597
Facility # 284696
Remediation # 4938

Name of Operator: Williams Production RMT Company
Latitude: 39.602676 Longitude -108.282234
Location (QtrQty, Sec, Twp, Rng, Meridian): SWNE, Sec 21, T5S, R97W, 6th PM

COGCC Operator # 96850
County: Garfield

Appendix 6

Sundry Notice Pertaining to Background Arsenic



SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

Form with fields for 1. OGCC Operator Number (96850), 2. Name of Operator (Williams Production RMT Company), 3. Address (1058 County Road 215), 4. Contact Name (Jason Rauhen), 5. API Number (05-), 6. Well/Facility Name (TR 31-21-597), 7. OGCC Facility ID Number (284696), 8. Location (SWNE, Section 21, T5S, R97W, 6th P.M.), 9. County (Garfield), 10. Field Name (Trail Ridge), 11. Federal, Indian or State Lease Number.

Complete the Attachment Checklist

OP OGCC

Attachment Checklist table with rows for Survey Plat, Directional Survey, Surface Eqmpt Diagram, Technical Info Page, and Other.

General Notice

General Notice section containing checkboxes for Change of Location, Change Spacing Unit, Change Operator, Abandoned Location, Spud Date, and Reclamation.

Technical Engineering/Environmental Notice

Technical Engineering/Environmental Notice section containing checkboxes for Notice of Intent, Report of Work Done, Intent to Recomplete, Change Drilling Plans, Request to Vent or Flare, Repair Well, E&P Waste Disposal, Beneficial Reuse of E&P Waste, Status Update/Change of Remediation Plans, and Casing/Cementing Program Change.

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

Signed: Jason Rauhen, Date: 07/30/2010, Email: Jason.Rauhen1@Williams.com, Print Name: Jason Rauhen, Title: Environmental Specialist II

COGCC Approved: Title: Date:

CONDITIONS OF APPROVAL, IF ANY:

TECHNICAL INFORMATION PAGE



FOR OGCC USE ONLY

1. OGCC Operator Number: 96850 API Number: _____
2. Name of Operator: Williams Production RMT Company OGCC Facility ID # 284696
3. Well/Facility Name: TR 31-21-597 Well/Facility Number: _____
4. Location (QtrQtr, Sec, Twp, Rng, Meridian): SWNE, Section 21, T5S, R97W, 6th P.M.

This form is to be completed whenever a Sundry Notice is submitted requiring detailed report of work to be performed or completed. This form shall be transmitted within 30 days of work completed as a "subsequent" report and must accompany Form 4, page 1.

5. DESCRIBE PROPOSED OR COMPLETED OPERATIONS

This COGCC Form 4 is being submitted as a request to meet the background concentration levels for arsenic at the TR 32-21-597 well pad relative to the production pit closure at the subject facility in accordance with footnote 1 to the COGCC table 910-1.

The request is based on the analytical results presented below (see attached laboratory reports).

Seven (7) grab samples were collected from locations within the pit footprint to ascertain the arsenic concentration of the facility.

- TR 32-21-597_PT5021_North Pit Bottom - 4.0 mg/kg
- TR 32-21-597_PT5021_South Pit Bottom - 3.6 mg/kg
- TR 32-21-597_PT5021_South Wall - 3.3 mg/kg
- TR 32-21-597_PT5021_North Wall - 3.6 mg/kg
- TR 32-21-597_PT5021_East Wall - 3.3 mg/kg
- TR 32-21-597_PT5021_West Wall - 3.4 mg/kg
- TR 32-21-597_PT5021_West Pit Bottom - 2.9 mg/kg

Average concentration - 3.4 mg/kg

Three (3) grab samples were collected from nearby non-impacted, native soil to establish the background arsenic concentrations.

- TR 32-21-597_PT5021_Bkgd 1 - 3.9 mg/kg
- TR 32-21-597_PT5021_Bkgd 2 - 3.4 mg/kg
- TR 32-21-597_PT5021_Bkgd 3 - 3.3 mg/kg

Average concentration - 3.5 mg/kg

Williams is requesting this approval in order to proceed with closure and reclamation of the produced water pit located on the TR 32-21-597 well pad.