# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745
Artesia ▲ Carlsbad ▲ Durango ▲ Midland


November 13, 2015

RECEIVED
By OCD; Dr. Oberding at 11:33 am, Nov 16, 2015

APPROVED conditionally
By OCD; Dr. Oberding at 11:33 am, Nov 16, 2015

1RP-3820

Dr. Tomáš Oberding
Ms. Kellie Jones
NMOCD District 1
1625 French Drive
Hobbs, New Mexico 88240
*VIA EMAIL*

OCD Conditions for approval:
If at the conclusion of the proposed time, the project is deemed unsuccessful as outlined herein, the operator will be responsible for excavation and removal of the impacted soils.

RE: Remediation Plan for Paloma State #1 - API # 30-025-31153
8/25/15 Tank Battery Release.\, UL O, Section 36, T18S R32E
Strata Production

Dr. Oberding and Ms. Jones:

On behalf of Strata Production, R.T. Hicks Consultants submits Remediation Plan for the above referenced release. For the purpose of ease of review this plan includes three sections:

1. Environmental Setting
2. Investigation and Results
3. Contractor instructions

## Environmental Setting

Plate 1 shows the location of the Paloma State #1 location on a surface geology map that displays groundwater from nearby wells and wells listed on the OSE database. The elevation data are from the USGS database (colored triangles), published reports or field data obtained by Hicks Consultants (colored squares). These measurements are taken by professionals.

Wells from the OSE database are shown as triangles within circles and show depth to water data. Wells in the OSE database are often mis-located (e.g. L-3454 is not evident on any Google Earth images) and the depth to water measurements are estimates from drillers obtained after completing the well. Sometimes, this database provides reasonable data and sometimes the data are seriously flawed.

Plate 2 shows the measured water elevation data and an interpretation of the potentiometric surface based upon the relatively sparse data. Note that two USGS wells near the site show a difference of water elevations in excess of 200 feet. USGS well 1018 is 850 feet deep and USGS well is 130 feet deep. For the potentiometric surface interpretation we used the shallow water data.

The data suggest that groundwater lies at an elevation of about 3550 beneath the site. As the site has a surface elevation of 3710, depth to water is about 160 feet.

In this area, the uppermost water-bearing unit is the Dockum Group Redbeds. This unit can be confined or unconfined (non-pressurized). The lithology of this unit typically consists of relatively thin, discontinuous lenses of sandstone within a siltstone/claystone matrix. At the base of the Dockum Group is the continuous Santa Rosa Sandstone, which is the principal aquifer of the unit.

The site is relatively flat, sloping from northeast to south-southwest. There are no defined watercourses nearby. The nearest water body is Laguna Tonto, about 6 miles to the southeast (Plate 3). The nearest mapped watercourses lie about 4 miles north. Our surface investigation shows no watercourses near the site as it is characterized by sand dunes.

## Initial Response, Sampling and Results

About 2-3 days prior to the lightning strike that caused the release, the produced water tank was emptied. Thus, the volume of produced water released was close to zero. Tank gauging data allows a fairly good estimate of the volume of crude released: 110 barrels. Knowing how much of the release crude was consumed by the fire is unknown. Figures 1-2 show the site soon after the fire. Plate 4 shows our interpretation of the area where ash and evidence of the fire is dominant and where ash and residual liquid is dominant. We found only one area in the zone of ash that exhibited some liquids; a 2-foot by 2-foot area where a crude tank landed.

The initial response by Strata involved using a backhoe/end loader to scoop the crude from the surface. The crew removed as much liquid crude as possible, creating a stockpile of impaired material near the heater treater. The area of impact (ash and residual oil) was then dragged by the end-loader of the backhoe to cover the crude to reduce the potential of exposure to cattle. Figures 3 and 4 show the result of the initial response.

Hicks Consultants obtained several samples on September 2, 2015 and October 1, 2015. The samples were taken from various places measured from the heater treater. The photograph Figure 5 shows the boring for Sample 93S 5E (93 feet south of the heater treater and 5 feet east of due south) and illustrates the nature of all sample locations: the crude is either 100% of a particular volume of earth or 0%. At each of the five sampling locations taken in September, the boring terminated at dune sand that showed no evidence of any release (recent crude, old crude, produced water). We found no evidence of crude below a depth of 6-18 inches. The October 1 sampling event used a backhoe to excavate eight sampling trenches within the area of impact. The laboratory results of the sampling are presented in Table 1 and Appendix A.

Table 1- Laboratory Results

| Sample ID | | | Results in mg/kg | | | | | | Date |
|---|---|---|---|---|---|---|---|---|---|
| South | East | Depth (inches) | BTEX | GRO | DRO | MRO | TPH | Chloride | |
| 90 | 86 | 9 | | | | | | ND | 1-Sep |
| 90 | 86 | 0-4 | 6.25 | 1400 | 12000 | 0 | 13400 | 63 | 1-Sep |
| 93 | 5 | 12 | 0 | 37 | 350 | 290 | 677 | 2600 | 1-Sep |
| 93 | 13 | 4 | 0 | 19 | 490 | 390 | 899 | 1300 | 1-Sep |
| 94 | 22 | 2 | | ND | ND | ND | | 3800 | 1-Oct |
| 104 | 16 | 2 | | 94.1 | 1200 | 1800 | 3094.1 | 1600 | 1-Oct |
| 104 | 16 | 4 | | | | | | 2500 | 1-Oct |
| 104 | 16 | 10 | | | | | | 100 | 1-Oct |
| 120 | 10 | 18 | | | | | | 3200 | 1-Sep |
| 120 | 10 | 0-16 | 9 | 1300 | 3500 | 1900 | 6700 | 2100 | 1-Sep |
| 140 | 10 | 24 | | | | | | 3500 | 1-Sep |
| Stockpile | | | 0.068 | 17 | 2200 | 2500 | 4717 | 3700 | 1-Sep |

We also used field titration methods to estimate chloride concentrations from many samples obtained on October 1. The samples results as well as all of the laboratory results are presented in the following table. Comments relating to the results appear to the right of the table.

Table 2- Field and Laboratory Chloride

| Sample ID | Depth - feet | Cl mg/kg | |
|---|---|---|---|
| 60 s 26 e | 2 | 308.9 | |
| 60 s 26 e | 4 | 277.0 | |
| 90 s 86 e | 0.25 | 63 | Lab |
| 90 s 86 e | 0.75 | 0 | Lab |
| 93 s 5 e | 1 | 2600 | Lab |
| 93 s 13 e | 4 | 1300 | Lab |
| 94 s 22 e | 2 | 3800.0 | Lab |
| 94 s 22 e | 2 | 2130.4 | |
| 94 s 22 e | 2 | 3848.6 | |
| 94 s 22 e | 4 | 180.4 | |
| 94 s 22 e | 4 | 325.1 | |
| 94 s 22 e | 6 | 192.1 | |
| 94 s 22 e | 6 | 125.0 | |
| 94 s 22 e | 8 | 265.0 | |
| 94 s 22 e | 10 | 331.4 | |
| 104 s 16 e | 2 | 1576.8 | |
| 104 s 16 e | 2 | 1600.0 | Lab |
| 104 s 16 e | 2 | 1688.9 | |
| 104 s 16 e | 4 | 2454.9 | |
| 104 s 16 e | 4 | 2539.4 | |
| 104 s 16 e | 4 | 2500.0 | Lab |
| 104 s 16 e | 6 | 131.2 | |
| 104 s 16 e | 8 | 399.9 | |
| 104 s 16 e | 10 | 344.1 | |
| 105 s 16 e | 10 | 100.0 | Lab |
| 105 s 16 e | 10 | 153.1 | |
| 120 s 10 e | 0-1.3 | 2100 | Lab |
| 120 s 10 e | 1.5 | 3200 | Lab |
| 131 s 16e | 2 | 73.3 | |
| 131 s 16 e | 2 | 83.9 | |
| 131 s 16 e | 4 | 75.6 | |
| 131 s 16 e | 6 | 171.8 | |
| 131 s 28 e | 2 | 2204.6 | |
| 131 s 28 e | 2 | 2427.8 | |
| 131 s 28 e | 4 | 3102.2 | |
| 131 s 28 e | 4 | 2686.4 | |
| 131 s 28 e | 6 | 3456.1 | |
| 131 s 28 e | 8 | 1574.4 | |
| 132 s 28 e | 10 | 207.0 | |
| 140 s 10 e | 2 | 3500 | Lab |
| 161 s 0 e | 2 | 106.7 | |
| 161 s 0 e | 2 | 78.7 | |
| 161 s 0 e | 4 | 99.6 | |
| 161 s 21 e | 2 | 3147.5 | |
| 161 s 21 e | 2 | 3198.5 | |
| 161 s 21 e | 4 | 2917.5 | |
| 161 s 21 e | 8 | 111 | |
| 161 s 21 e | 10 | 76.0 | |
| Stockpile | | 3700 | |

The sample 90 s 86 e was a crude-rich sample where the crude tank landed to the east of the pad after the lighting strike. We collected this sample to determine if BTEX was present where staining existed. BTEX and chloride were very low.

The agreement between laboratory results and field titration is quite good.

Chloride concentrations are low below 4 feet in the area from the heater treater (0,0) to about 100 feet south of the heater treater.

Obvious crude staining occurs from about 100 feet south of the heater treater to the southern edge of the former battery.

Agreement between field titrations and lab results are quite good.

Correlation between lab and field methods for this sample are acceptable.

The sample 131 s 16 e is near the pad and is low in chloride. Spilled produced water and crude drained to the east as shown in the figures.

Where the produced water pooled, near 131 s 28e, penetration of chloride reached about 8 feet.

Near the production pad, chloride concentrations are low.

Penetration of chloride to 6 feet is obvious from sample 161 s 21 e.

## Proposed Remedy

Strata Production has elected to address the most recent release and, as a voluntary action, address any historic impacts beneath the tank battery. The attached contractor instructions provide the proposed step-by-step remedial plan for phyto-remediation[1] of stained soil and chloride flushing of soil that does not contain hydrocarbon constituents. As suggested in the attached Contractor Instructions, the proposed remediation will consist of

A. Moving stained soil from the stockpile created during the initial response (Figure 4) and any stained soil excavated during construction of the remediation area to the southern portion (see Plate 6) of the remediation area.
B. Tilling the stained soil to break up the released crude into smaller particles – perhaps 1-3 inches in width/length
C. Placing unstained sand/soil with chloride concentrations greater than 800 mg/L over the rototilled stained soil
D. Allowing several precipitation events to flush salt from the stained soil and provide moisture to the hydrocarbon-impacted material
E. Early in the 2016 monsoon season, seeding the area to create a root zone where microbes will, over time, degrade the crude
F. Annual sampling events to document the growth of native species and to provide evidence of the disintegration and degradation of the hydrocarbons and flushing of salt.

Please contact me as necessary after your review of this document. We stand ready to submit a final C-141 if the proposed protocol meets with approval.

Sincerely,
R.T. Hicks Consultants

Randall Hicks
Principal

Copy: Paul Ragsdale, Strata Production
State Land Office

[1] A reasonable overview of the phytoremediation process is provided in https://clu-in.org/download/Citizens/a_citizens_guide_to_phytoremediation.pdf

## Contractor Instructions – Strata Production Paloma State #1

1. Remove crude-stained soil in the area northeast of the battery (where the tank fell) with a rake, shovel and wheel barrow to the existing Stockpile (Stockpile #S shown in Figure 4– for stained soil).
2. In the footprint of the remediation area (Plate 5) remove
    a. stained material to 3-feet below the elevation of the production pad to Stockpile S
    b. unstained material to 1 to 2-feet below production pad Stockpile UCl (Unstained with chloride)
    c. As sand near the production pad shows chloride less than 800 mg/kg, place it in a third stockpile (C – clean sand). This material will be used to create the berms discussed below.
    d. The result will be an excavation that is 3 foot below the grade of the constructed location in the phyto-remediation area (green) and 2-feet below the pad in the flushing area (yellow).
    e. ***Note****: The evaluation shows that stained soil does not exist below 24 inches in most of the area scheduled for excavation and is not present in the soil flushing area*.
3. In the phytoremediation area (beneath the tanks in Plate 5),
    a. Place the material of Stockpile S such that it is 6-inches thick or less and at least 2 feet below the elevation of the production pad. Expand the phyto-remediation area as needed to allow for thin-spreading this material.
    b. Roto till or otherwise disaggregate the stained material such that the size of the stained particles is less than 2-inches in diameter
    c. Place the material of Stockpile UCl over the stained material such that this layer is 12-inches or less – expand the phytoremediation
        i. area as required to maintain the top of the placed material about 12- inches below the elevation of the production pad.
    d. Using clean sand from the excavation or caliche borrowed from the
        i. production pad, construct a berm around the phyto-remediation area such that the top of the berm is at least 12 inches above the elevation of the production pad
4. The soil flushing area (the northern portion of the remediation area that contains little or no hydrocarbons) should also be about 1-foot below the elevation of the production pad. This will be accomplished by excavating clean sand from the remediation area as necessary
5. As shown in Plates 4-5,
    a. Construct a swale that is about 150 feet long and about 1-2 inches below the elevation of the production pad to direct runoff toward the bermed remediation area
    b. Where the swale meets the berm of the remediation area, install a culvert through the berm to allow directed stormwater to enter the remediation area
    c. Install a culvert on the north side of the remediation area that is the same elevation as the pad to allow flow of water to a constructed ponding area as shown on Plate 5. Place all clean sand from this construction on the berms of the remediation area as this will facilitate final reclamation as described below.
6. Install a barbed wire fence around the remediation area.

**Post Construction Monitoring**

- Soon after completion of this construction, the phytoremediation be sampled by Hicks Consultants in 5 locations:
    - Two locations within the area defined by the former tanks
    - Three locations outside of the area of the former tanks
- Depths of sampling are
    - 0-12 inches (chloride-impacted sand),
    - 12-24 inches (stained soil),
    - Discrete samples at 36, 48, 60 and 72 inches
- For the initial sampling event and October annual events, samples will be obtained at the depths identified above and a laboratory will evaluate samples for
    - chloride,
    - GRO, DRO and MRO
- In May-July 2015, after the first rainfall events, seed the phytoremediation area with native species to begin the phytoremediation process within the root zone of the plants
- On a quarterly basis, obtain 5 additional samples at locations described above and use field techniques to evaluate the samples for chloride at the following depths
    - 0-12 inches
    - 12-24 inches
    - Discrete sample at 36 inches
- On a quarterly basis, provide sample results and photographic documentation of the conditions at the site (condition of berms, vegetative growth, condition of drainage) to OCD and the SLO.
- The program terminates when two post-construction monitoring events meet the following criteria
    - Average chloride is less than 800 mg/kg for the samples at the five locations above 24-inches
    - Average chloride is less than 20,000 mg/kg for the samples at the five locations below 24 inches
    - Average GRO+DRO+MRO is less than 2,500 mg/kg (averaged over all depths and locations)
    - GRO+DRO is less than 1,000 mg/kg (averaged over all depths and locations)

After sampling shows compliance with the criteria of this plan, use the clean sand of the berms to reclaim the remediation area such that the upper surface of the remediation area is 4-feet below natural grade. Essentially, the final surface will be the reconstruction of nearby dunes and final restoration of this part of the production pad.

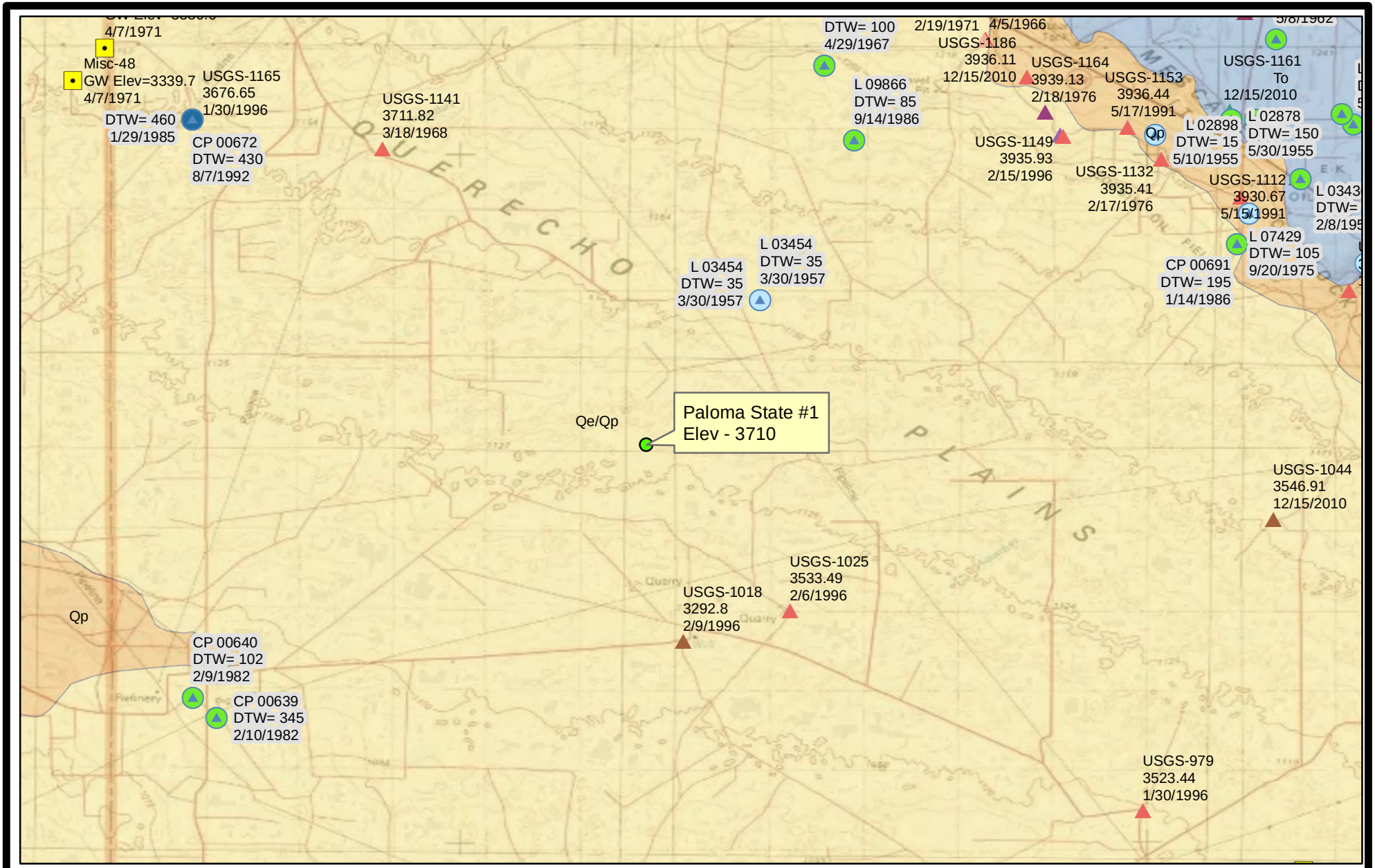
Figure 1 – The remains of the fiberglass produced water tank is in the foreground. One of the two oil tanks is in the background. Some liquid crude is on the location and some of the black material in the photograph is ash from the fire.

Figure 2 – One oil tank landed in the nearby pasture.

Figure 3 – View to the south from the same location as Figure 1. The initial response removed as much liquid crude as possible with a backhoe, creating a stockpile of impaired material near the heater treater. The area of impact (ash and residual oil) was then dragged by the end-loader of the backhoe to cover the crude to reduce the potential of exposure to cattle.

Figure 4 – View north from the access road. The tank battery was north of the yellow pipeline marker (center of photograph). The stockpile of impacted sand is near the heater treater (left). This image also shows the stabilized dunes that characterize the area. The new tank battery will be north of the yellow pipeline marker.

Figure 5 – Sample 93S 05E (measured from the heater treater) is a 12-inch boring. This sample, like all samples, shows that the crude oil is in discrete, small pockets. Thus, a 1-oz sample could be 100% crude or 100% clean dune sand. The largest pocket of crude observed during the sampling was slightly smaller than a football.



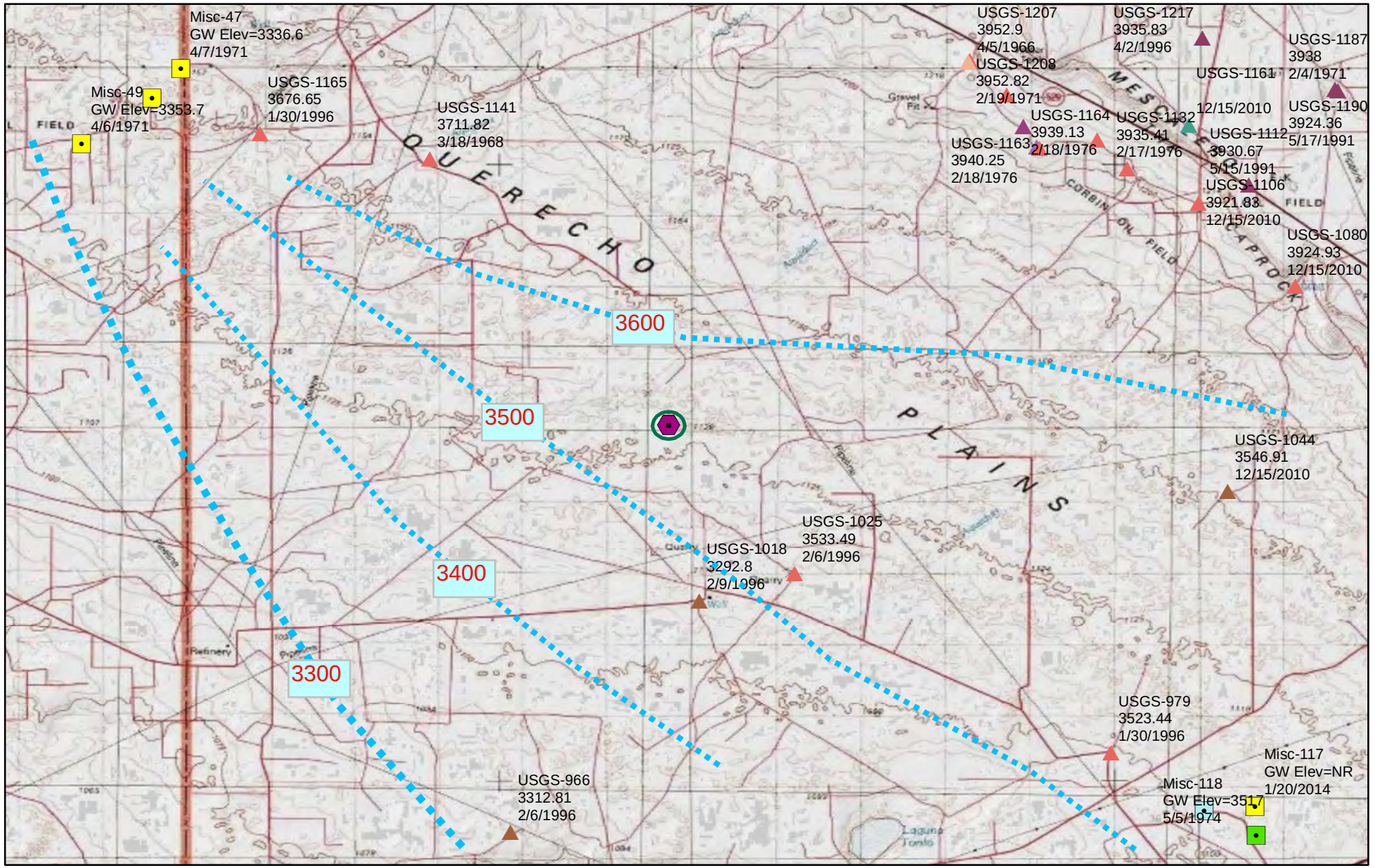

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Geology and Groundwater Elevation

Strata Production - Paloma State #1 Release

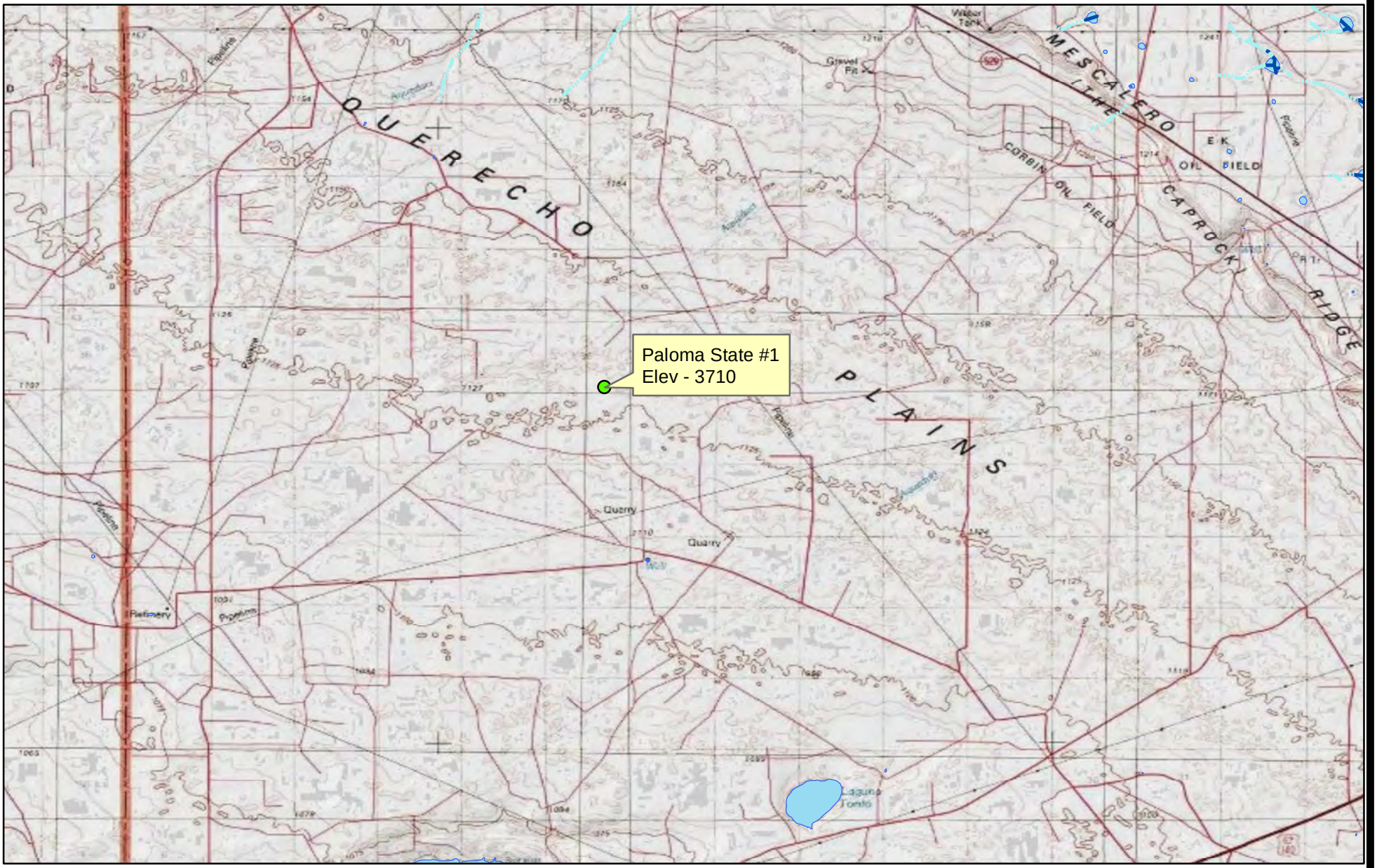
Plate 1

Sept 2015




R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

| | |
|---|---|
| Groundwater Elevation Map | Plate 2 |
| Strata Production - Paloma State #1 | Sept 2015 |

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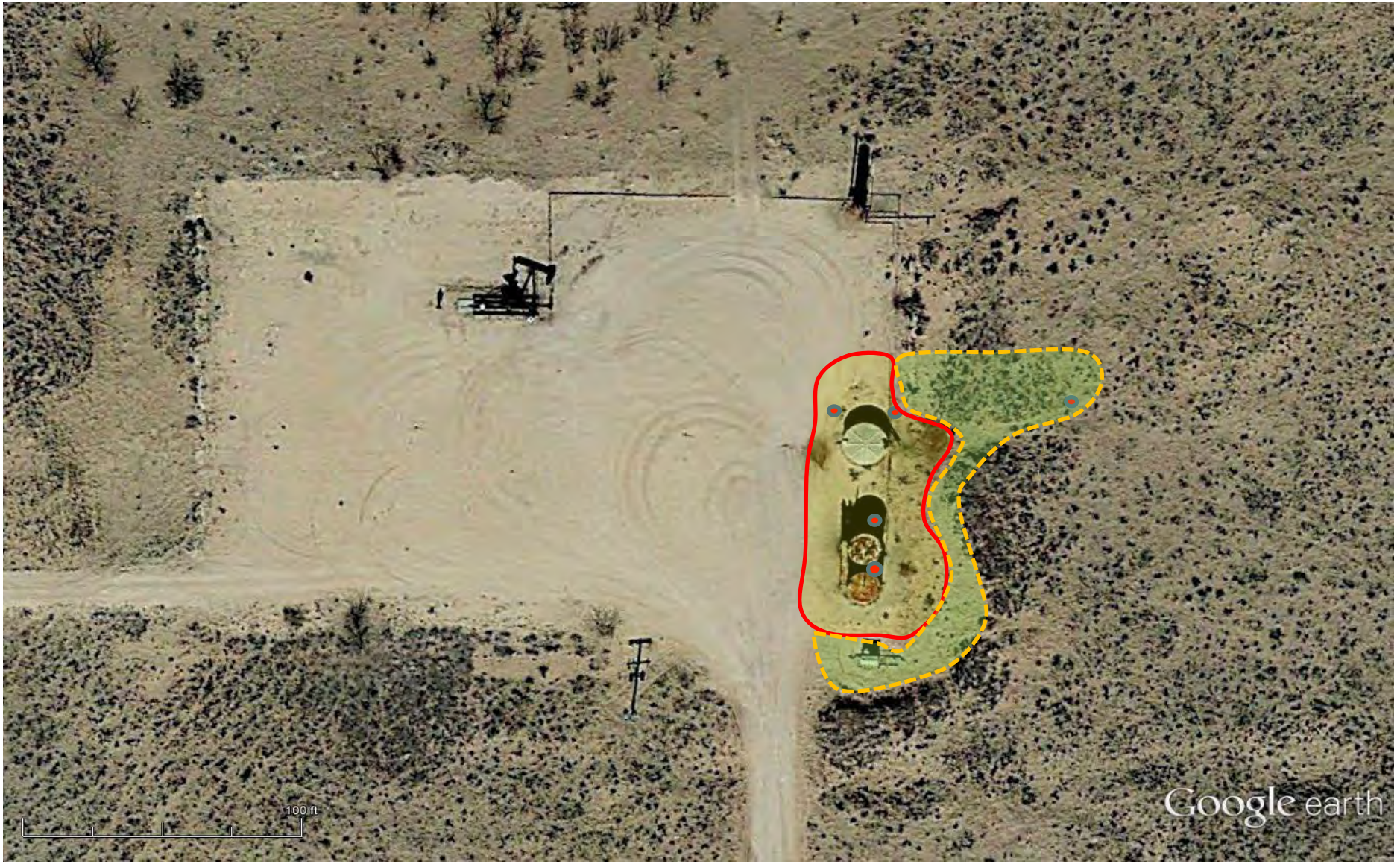
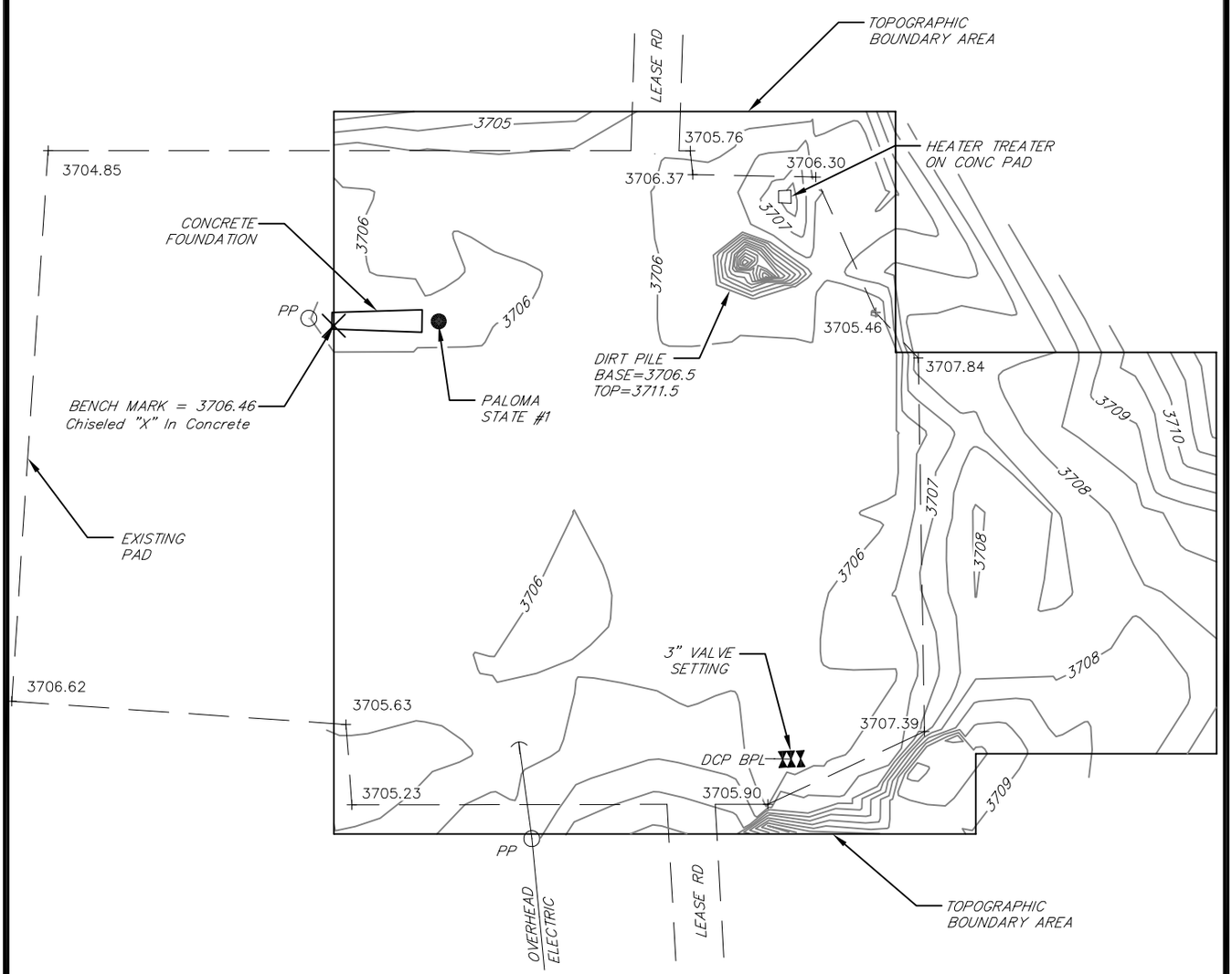
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Mapped Surface Water and Wetlands | Plate 3 |
| | Strata Production - Paloma State #1 Release | Sept 2015 |




| | | |
|---|---|---|
| **R.T. Hicks Consultants**<br>**Albuquerque, NM** | **Areas Impacted by Lightning Strike Release**<br>**Red Outline = Liquids and Ash & Orange Outline - Ash** | **Plate 4** |
| | **Strata Production - Paloma State #1** | **Sep-15** |

# STRATA PRODUCTION COMPANY
## PALOMA STATE #1 TOPOGRAPHIC SURVEY
### SECTION 36, T18S, R32E
### N. M. P. M., LEA COUNTY, NEW MEXICO

Plate 5




SCALE: 1" = 50'
0 25' 50'

*BEARINGS ARE GRID NAD 27 NM EAST*
*DISTANCES ARE HORIZ. GROUND.*

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that I prepared this plat from an actual survey made on the ground under my direct supervision, said survey and plat meet the Min. Stds. for Land Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett

Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 PROFESSIONAL SURVEYOR

*Firm No.: TX 10193838 NM 4655451*



| NO. | REVISION | DATE |
|---|---|---|
| | | |
| | | |
| | | |

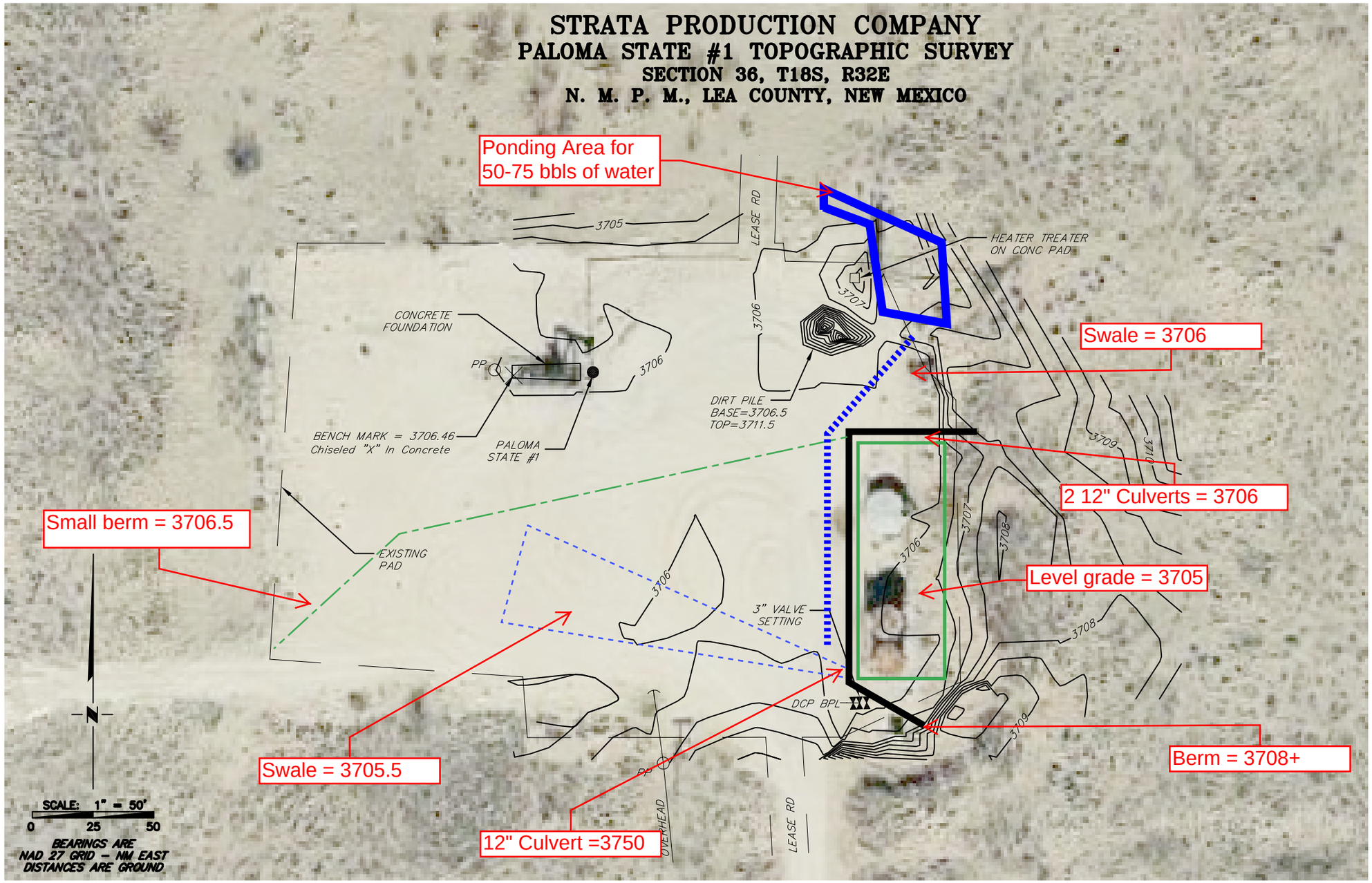
JOB NO.: LS1510592
DWG. NO.: 1510592–1

RRC

308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964–8200

SCALE: 1" = 50'
DATE: 11–02–2015
SURVEYED BY: BC/HD
DRAWN BY: LPS
APPROVED BY: RMH
SHEET : 1 OF 2

# STRATA PRODUCTION COMPANY
## PALOMA STATE #1 TOPOGRAPHIC SURVEY
### SECTION 36, T18S, R32E
### N. M. P. M., LEA COUNTY, NEW MEXICO



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| SCALE: | 1" = 50' |
| DATE: | 11-02-2015 |
| SURVEYED BY: | BC/HD |
| DRAWN BY: | LPS |
| APPROVED BY: | RMH |
| SHEET : | 1 OF 2 |

RRC
308 W. BROADWAY ST., HOBBS, NM 88240 (575) 964-8200

Plate 6

| NO. | REVISION | DATE |
|---|---|---|
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JOB NO.: LS15100592
DWG. NO.:1510592-2

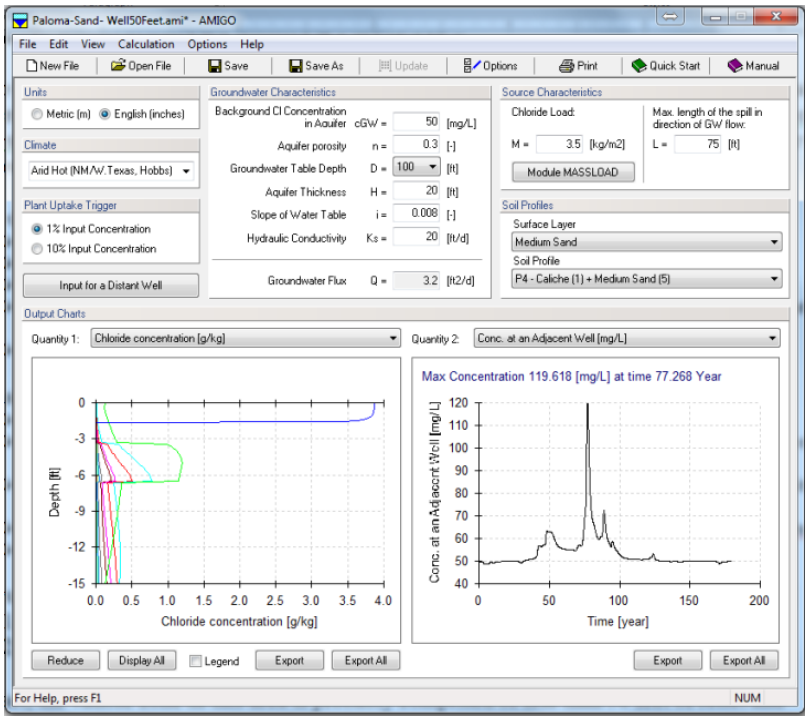
Firm No.: TX 10193838 NM 4655451

# Amigo Simulations – Paloma #1 Release

Two Hydrus-1D simulations using API's Amigo Decision Tool employ site-specific data and, where such data are not readily available, highly conservative input parameters. The result of the two simulations presented in the following reports is that the proposed flushing of chloride to below the root zone will not impair groundwater quality.

Site data include:

- Depth to groundwater is greater than 100 feet
- Hydraulic gradient is 0.008
- Medium sand is the surface layer
- Chloride concentration (chloride load) in the subsurface is less than 3700 mg/kg, which is displayed for the 0-2.5 foot thickness in the simulation
- The climate is similar to Hobbs, NM




Conservative assumptions are:

- The simulation model is 1-D, thus lateral dispersion of chloride is not allowed
- The plant uptake trigger is 1% - which prevents transpiration by plants until salinity decreases to 1% of the initial concentration
- The aquifer is a water table aquifer, which is not common in the Dockum Group (most permeable units are confined)
- The thickness of the aquifer and hydraulic conductivity are equal to or lower than what is expected in the Dockum Group sandstone
- Artificial flushing of the impacted area with fresh water does not occur

We used the same input parameters as those identified above and evaluated two scenarios of vadose zone texture beneath the surface layer:

1. 17% caliche and 83% medium sand and
2. 8% sandy clay and 92% medium sand

In fact, the vadose zone in this area is probably comprised of less than 50 feet of relict and reworked Ogallala Formation overlying the red mudstones of the Dockum Group. Thus, the choice of a relatively sandy vadose zone is a conservative input parameter and would exaggerate the impact of the release to groundwater.

The proposed flushing of the vadose zone with diverted storm water should result in numerous times during the year when the impact site lies beneath 12 inches of ponded fresh water. The periodic impoundment of fresh water over the impacted area will accelerate the downward migration of chloride molecules. Thus, center of chloride mass will penetrate a water table aquifer sooner than the 75 year time span predicted by the two simulations.

However, the chloride concentration of pore water released from the vadose zone to groundwater will be much less. Amigo predicts that the chloride concentration of pore water of the medium sand surface layer of the site (about 3800 mg/kg) will be about 19,000 mg/L with a water content of 38% (e.g. the pores are 100% filled by released produced water). The volume of pore space in the 2.5 foot thick surface layer is equivalent to (2.5*.38=) 0.95 feet of water. If the impacted area is impounded by 12 inches of water 10 times during the first two years of the corrective action, the concentration of chloride in the pore water would decline to about 2,000 mg/L

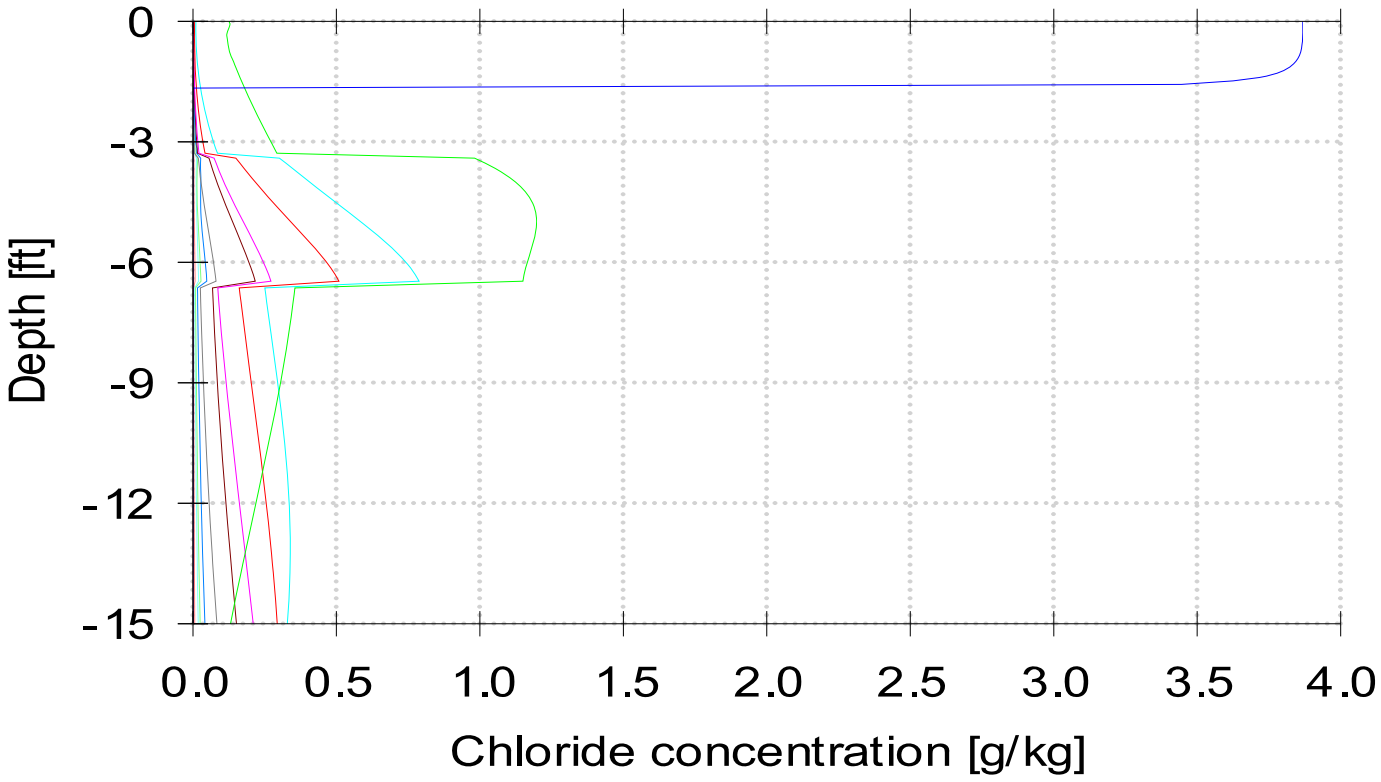
After two years of flushing, the root zone should be able to support vegetation and the diversion of storm water to the area will cease and the chloride concentration of pore water beneath the root zone would be about 2,000 mg/L. The last simulation presented provides a rough estimate of the impact to groundwater under this scenario by adjusting the chloride load input to cause the pore water concentration in pore water underlying the root zone to be about 2,000 mg/L. The result of this last simulation suggests that the dilution of salt in the pore water lessens the impact to groundwater.

**Project: Paloma-Sand+Caliche.ami**
Path: M:\Strata Production\Paloma State #1 Release\Amigo\Paloma-Sand+Caliche.ami
Date: 11/14/2015
Units: English (inches)
Climate: Arid Hot (NM/W.Texas, Hobbs)
Plant Uptake Trigger: 1% Input Concentration

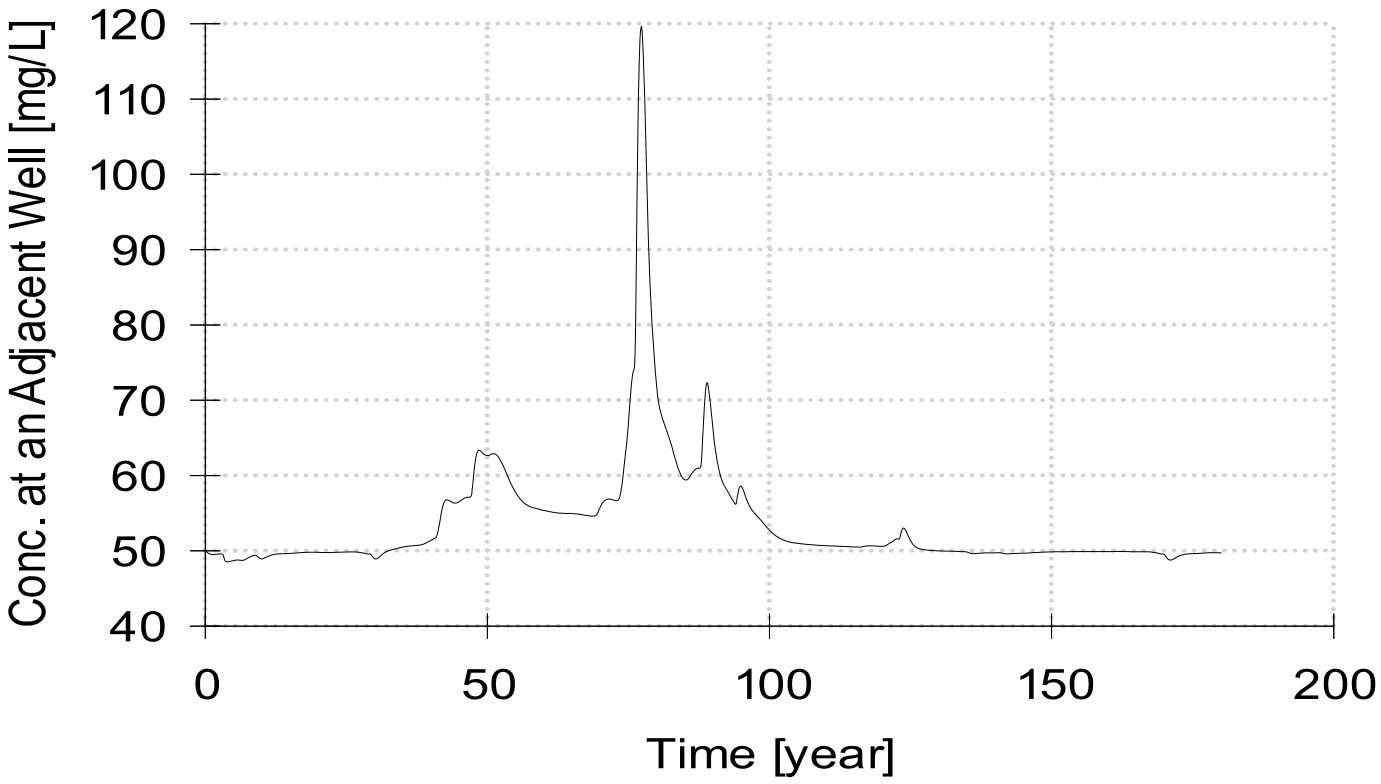
Groundwater Characteristics
Background Cl Concentration in Aquifer: 50 [mg/L]
Aquifer porosity: 0.3 [-]
Groundwater Table Depth: 100 [ft]
Aquifer Thickness: 20 [ft]
Slope of Water Table: 0.008 [-]
Hydraulic Conductivity: 20 [ft/d]
Groundwater Flux: 3.2 [ft2/d]

Source Characteristics
Chloride Load:: 3.5 [kg/m2]
Max. length of the spill in direction of GW flow:: 75 [ft]

Soil Profiles
Surface Layer: Medium Sand
Soil Profile: P4 - Caliche (1) + Medium Sand (5)




Max Concentration 119.618 [mg/L] at time 77.268 Year

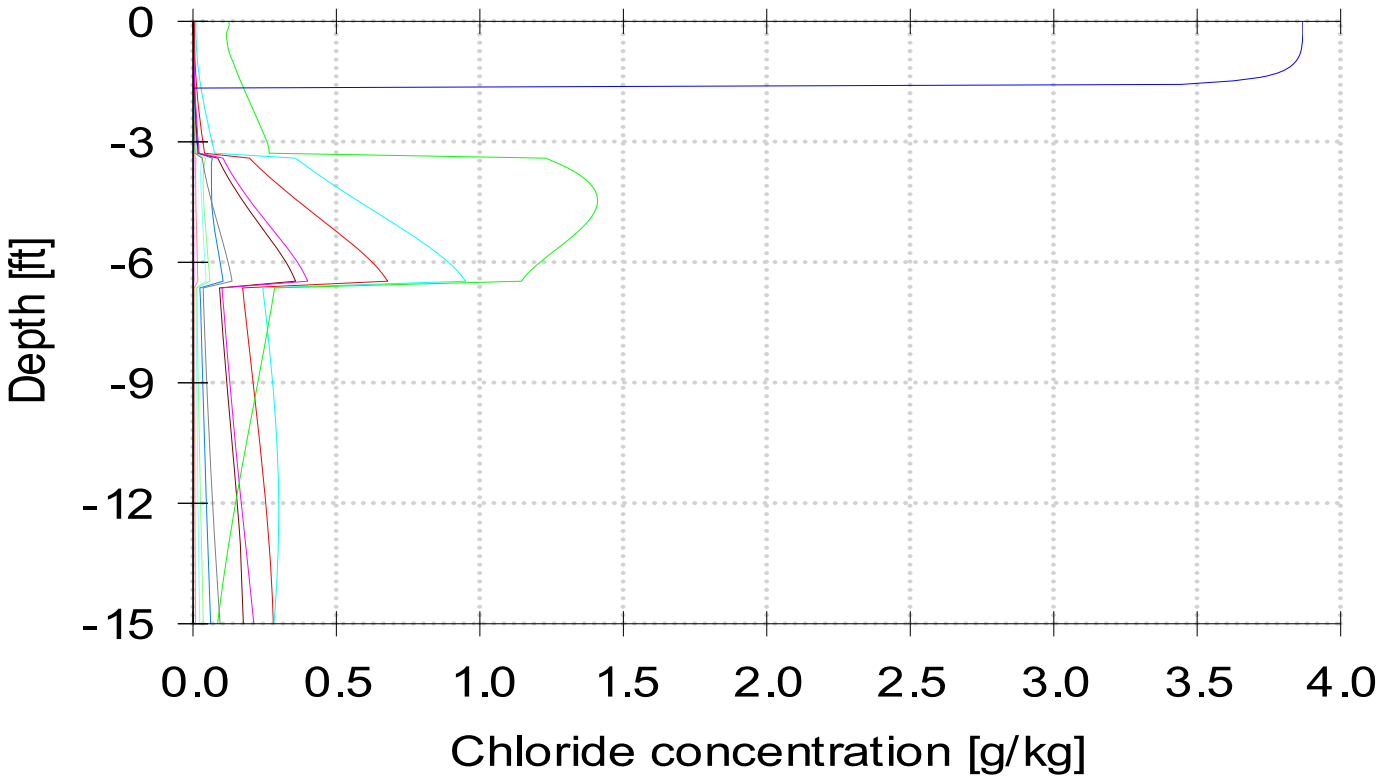


**Project: Paloma-Sand+SandyClay.ami**
Path: M:\Strata Production\Paloma State #1 Release\Amigo\Paloma-Sand+SandyClay.ami
Date: 11/14/2015
Units: English (inches)
Climate: Arid Hot (NM/W.Texas, Hobbs)
Plant Uptake Trigger: 1% Input Concentration

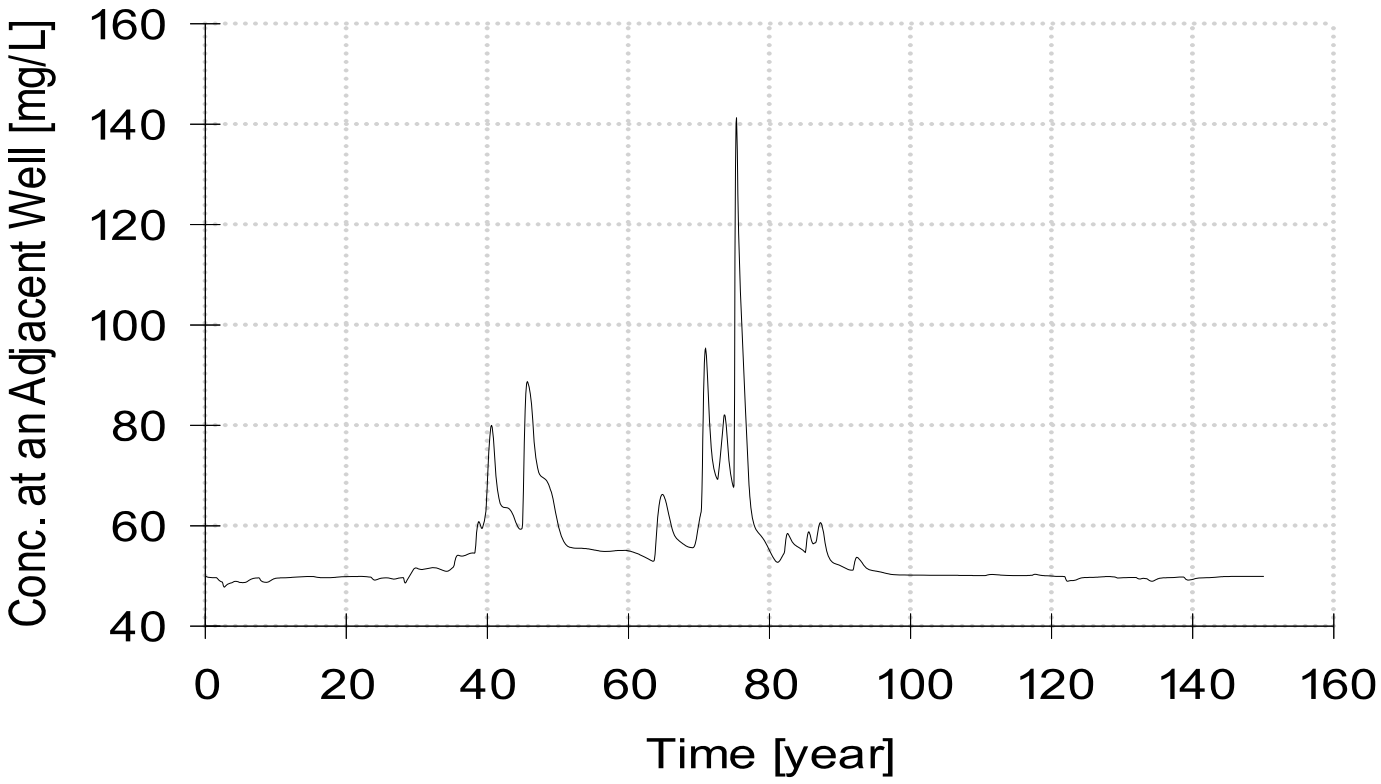
Groundwater Characteristics
Background Cl Concentration in Aquifer: 50 [mg/L]
Aquifer porosity: 0.3 [-]
Groundwater Table Depth: 100 [ft]
Aquifer Thickness: 20 [ft]
Slope of Water Table: 0.008 [-]
Hydraulic Conductivity: 20 [ft/d]
Groundwater Flux: 3.2 [ft2/d]

Source Characteristics
Chloride Load:: 3.5 [kg/m2]
Max. length of the spill in direction of GW flow:: 75 [ft]

Soil Profiles
Surface Layer: Medium Sand
Soil Profile: P2 - Sandy Clay (1) + Medium Sand (11)




Max Concentration 141.290 [mg/L] at time 75.312 Year

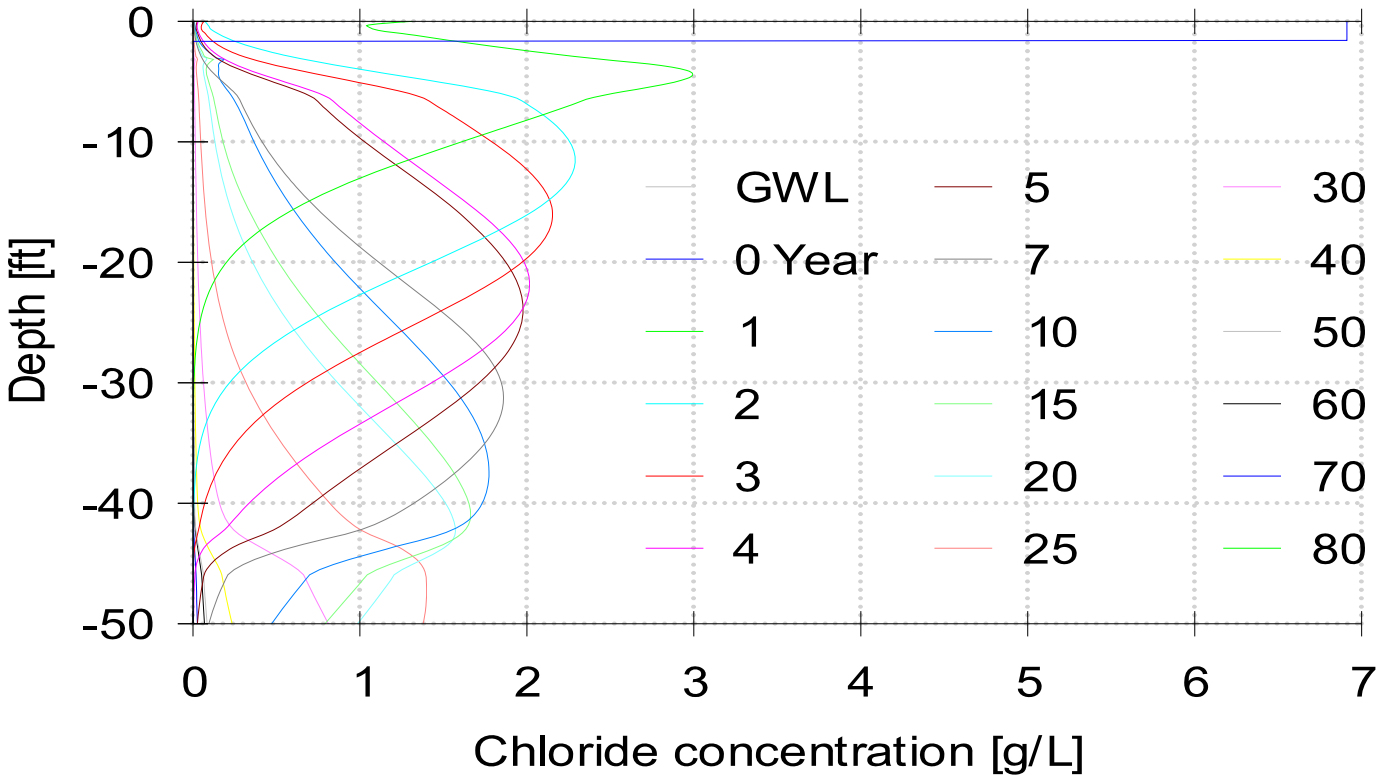


**Project: Paloma-Sand+SandyClay+Flushing.ami**
Path: M:\Strata Production\Paloma State #1 Release\Amigo\Paloma-Sand+SandyClay+Flushing.ami
Date: 11/14/2015
Units: English (inches)
Climate: Arid Hot (NM/W.Texas, Hobbs)
Plant Uptake Trigger: 1% Input Concentration

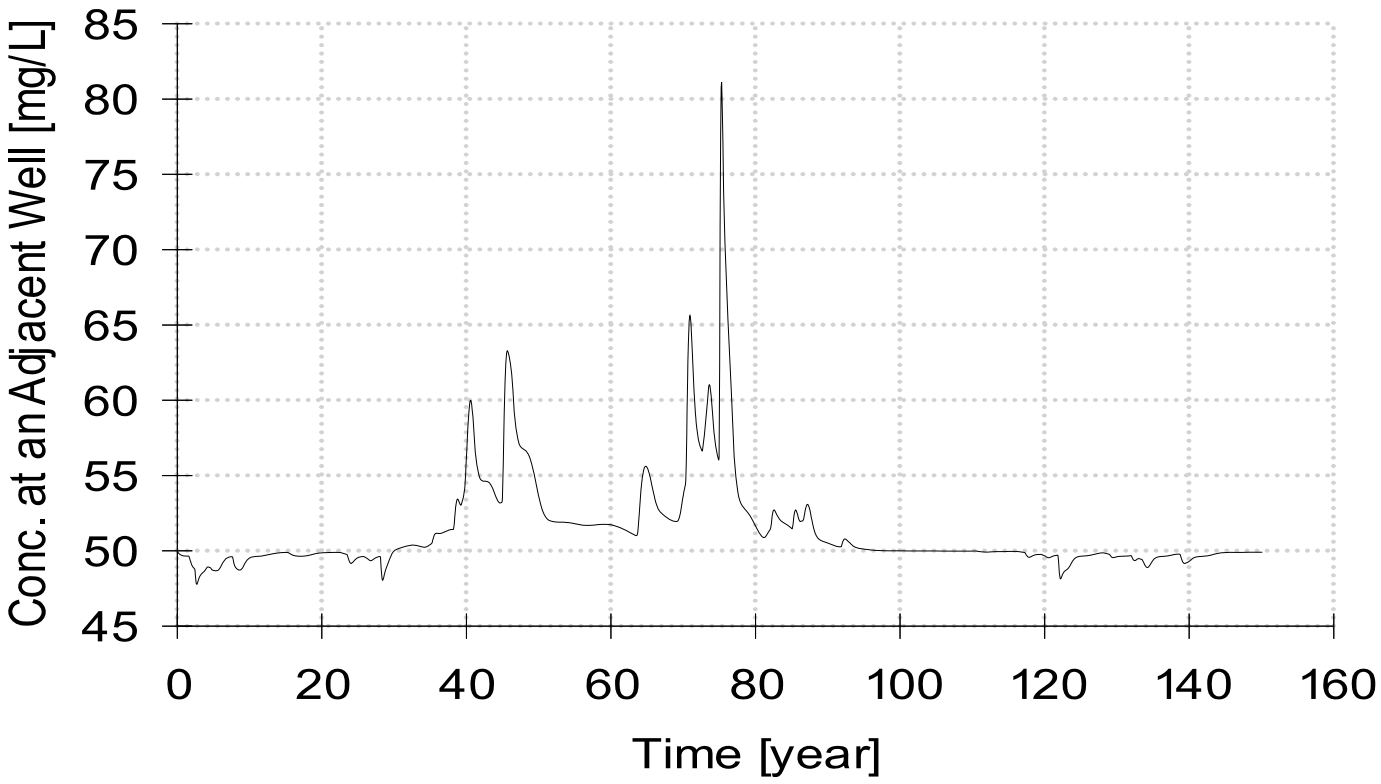
Groundwater Characteristics
Background Cl Concentration in Aquifer: 50 [mg/L]
Aquifer porosity: 0.3 [-]
Groundwater Table Depth: 100 [ft]
Aquifer Thickness: 20 [ft]
Slope of Water Table: 0.008 [-]
Hydraulic Conductivity: 20 [ft/d]
Groundwater Flux: 3.2 [ft2/d]

Source Characteristics
Chloride Load:: 1.25 [kg/m2]
Max. length of the spill in direction of GW flow:: 75 [ft]

Soil Profiles
Surface Layer: Medium Sand
Soil Profile: P2 - Sandy Clay (1) + Medium Sand (11)




Max Concentration 81.121 [mg/L] at time 75.312 Year



HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

September 16, 2015

Randall Hicks

R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW
Suite F-142
Albuquerque, NM 87104
TEL: (505) 266-5004
FAX (505) 266-0745

RE: Paloma Release OrderNo.: 1509253

Dear Randall Hicks:

Hall Environmental Analysis Laboratory received 8 sample(s) on 9/4/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

**Analytical Report**
Lab Order **1509253**
Date Reported: **9/16/2015**

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** Stockpile HT
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:04:00 PM
**Lab ID:** 1509253-001 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 3700 | 750 | | mg/Kg | 500 | 9/9/2015 10:02:50 PM | 21206 |
| **EPA METHOD 8015D MOD: GASOLINE RANGE** | | | | | | Analyst: **AG** | |
| Gasoline Range Organics (GRO) | 17 | 5.0 | | mg/Kg | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Surr: BFB | 116 | 70-130 | | %REC | 1 | 9/9/2015 6:54:08 PM | 21177 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | 2200 | 120 | | mg/Kg | 10 | 9/11/2015 9:02:16 AM | 21186 |
| Motor Oil Range Organics (MRO) | 2500 | 620 | | mg/Kg | 10 | 9/11/2015 9:02:16 AM | 21186 |
| Surr: DNOP | 0 | 57.9-140 | S | %REC | 10 | 9/11/2015 9:02:16 AM | 21186 |
| **EPA METHOD 8260B: VOLATILES SHORT LIST** | | | | | | Analyst: **AG** | |
| Benzene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Toluene | 0.068 | 0.050 | | mg/Kg | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Ethylbenzene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Xylenes, Total | ND | 0.10 | | mg/Kg | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Surr: 1,2-Dichloroethane-d4 | 94.7 | 70-130 | | %REC | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Surr: 4-Bromofluorobenzene | 83.3 | 70-130 | | %REC | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Surr: Dibromofluoromethane | 99.9 | 70-130 | | %REC | 1 | 9/9/2015 6:54:08 PM | 21177 |
| Surr: Toluene-d8 | 88.3 | 70-130 | | %REC | 1 | 9/9/2015 6:54:08 PM | 21177 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 98 S 13W 4"
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:26:00 PM
**Lab ID:** 1509253-002 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 1300 | 750 | | mg/Kg | 500 | 9/9/2015 10:27:38 PM | 21206 |
| **EPA METHOD 8015D MOD: GASOLINE RANGE** | | | | | | Analyst: **AG** | |
| Gasoline Range Organics (GRO) | 19 | 5.0 | | mg/Kg | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Surr: BFB | 115 | 70-130 | | %REC | 1 | 9/9/2015 7:22:55 PM | 21177 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | 490 | 11 | | mg/Kg | 1 | 9/11/2015 10:51:57 AM | 21186 |
| Motor Oil Range Organics (MRO) | 390 | 55 | | mg/Kg | 1 | 9/11/2015 10:51:57 AM | 21186 |
| Surr: DNOP | 110 | 57.9-140 | | %REC | 1 | 9/11/2015 10:51:57 AM | 21186 |
| **EPA METHOD 8260B: VOLATILES SHORT LIST** | | | | | | Analyst: **AG** | |
| Benzene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Toluene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Ethylbenzene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Xylenes, Total | ND | 0.10 | | mg/Kg | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Surr: 1,2-Dichloroethane-d4 | 93.5 | 70-130 | | %REC | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Surr: 4-Bromofluorobenzene | 76.0 | 70-130 | | %REC | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Surr: Dibromofluoromethane | 97.2 | 70-130 | | %REC | 1 | 9/9/2015 7:22:55 PM | 21177 |
| Surr: Toluene-d8 | 86.2 | 70-130 | | %REC | 1 | 9/9/2015 7:22:55 PM | 21177 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 120 S 10E 0-16"
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:54:00 PM
**Lab ID:** 1509253-003 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 2100 | 750 | | mg/Kg | 500 | 9/9/2015 10:52:27 PM | 21206 |
| **EPA METHOD 8015D MOD: GASOLINE RANGE** | | | | | | Analyst: **RAA** | |
| Gasoline Range Organics (GRO) | 1300 | 100 | | mg/Kg | 20 | 9/10/2015 2:31:33 PM | 21177 |
| Surr: BFB | 107 | 70-130 | | %REC | 20 | 9/10/2015 2:31:33 PM | 21177 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | 3500 | 110 | | mg/Kg | 10 | 9/11/2015 12:14:07 PM | 21186 |
| Motor Oil Range Organics (MRO) | 1900 | 540 | | mg/Kg | 10 | 9/11/2015 12:14:07 PM | 21186 |
| Surr: DNOP | 0 | 57.9-140 | S | %REC | 10 | 9/11/2015 12:14:07 PM | 21186 |
| **EPA METHOD 8260B: VOLATILES SHORT LIST** | | | | | | Analyst: **AG** | |
| Benzene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Toluene | 1.2 | 0.050 | | mg/Kg | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Ethylbenzene | 1.5 | 0.050 | | mg/Kg | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Xylenes, Total | 6.3 | 0.10 | | mg/Kg | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Surr: 1,2-Dichloroethane-d4 | 95.7 | 70-130 | | %REC | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Surr: 4-Bromofluorobenzene | 112 | 70-130 | | %REC | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Surr: Dibromofluoromethane | 96.1 | 70-130 | | %REC | 1 | 9/9/2015 7:51:43 PM | 21177 |
| Surr: Toluene-d8 | 95.6 | 70-130 | | %REC | 1 | 9/9/2015 7:51:43 PM | 21177 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 140 S 10E 24"
**Project:** Paloma Release
**Collection Date:** 9/2/2015 4:01:00 PM
**Lab ID:** 1509253-004 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **SRM** | |
| Chloride | 3500 | 750 | | mg/Kg | 500 | 9/10/2015 11:57:48 AM | 21248 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 120 S 10E 18"
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:53:00 PM
**Lab ID:** 1509253-005 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **SRM** | |
| Chloride | 3200 | 750 | | mg/Kg | 500 | 9/10/2015 12:22:36 PM | 21248 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 90 S 86E 0-4
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:30:00 PM
**Lab ID:** 1509253-006 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **SRM** | |
| Chloride | 63 | 30 | | mg/Kg | 20 | 9/10/2015 12:35:01 PM | 21248 |
| **EPA METHOD 8015D MOD: GASOLINE RANGE** | | | | | | Analyst: **RAA** | |
| Gasoline Range Organics (GRO) | 1400 | 99 | | mg/Kg | 20 | 9/10/2015 3:00:21 PM | 21177 |
| Surr: BFB | 107 | 70-130 | | %REC | 20 | 9/10/2015 3:00:21 PM | 21177 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | 12000 | 1100 | | mg/Kg | 100 | 9/10/2015 6:53:21 PM | 21186 |
| Motor Oil Range Organics (MRO) | ND | 5400 | | mg/Kg | 100 | 9/10/2015 6:53:21 PM | 21186 |
| Surr: DNOP | 0 | 57.9-140 | S | %REC | 100 | 9/10/2015 6:53:21 PM | 21186 |
| **EPA METHOD 8260B: VOLATILES SHORT LIST** | | | | | | Analyst: **AG** | |
| Benzene | ND | 0.050 | | mg/Kg | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Toluene | 0.31 | 0.050 | | mg/Kg | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Ethylbenzene | 0.94 | 0.050 | | mg/Kg | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Xylenes, Total | 5.0 | 0.099 | | mg/Kg | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Surr: 1,2-Dichloroethane-d4 | 103 | 70-130 | | %REC | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Surr: 4-Bromofluorobenzene | 20.5 | 70-130 | S | %REC | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Surr: Dibromofluoromethane | 104 | 70-130 | | %REC | 1 | 9/9/2015 8:20:29 PM | 21177 |
| Surr: Toluene-d8 | 88.1 | 70-130 | | %REC | 1 | 9/9/2015 8:20:29 PM | 21177 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 90 S 86E 9'
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:53:00 PM
**Lab ID:** 1509253-007 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **SRM** | |
| Chloride | ND | 30 | | mg/Kg | 20 | 9/10/2015 1:24:40 PM | 21248 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** R.T. Hicks Consultants, LTD
**Client Sample ID:** 93 S 05E 12"
**Project:** Paloma Release
**Collection Date:** 9/2/2015 3:22:00 PM
**Lab ID:** 1509253-008 **Matrix:** SOIL **Received Date:** 9/4/2015 9:25:00 AM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **SRM** | |
| Chloride | 2600 | 750 | | mg/Kg | 500 | 9/10/2015 2:01:53 PM | 21248 |
| **EPA METHOD 8015D MOD: GASOLINE RANGE** | | | | | | Analyst: **RAA** | |
| Gasoline Range Organics (GRO) | 37 | 5.0 | | mg/Kg | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Surr: BFB | 115 | 70-130 | | %REC | 1 | 9/10/2015 3:29:06 PM | 21177 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | 350 | 11 | | mg/Kg | 1 | 9/11/2015 1:36:21 PM | 21186 |
| Motor Oil Range Organics (MRO) | 290 | 53 | | mg/Kg | 1 | 9/11/2015 1:36:21 PM | 21186 |
| Surr: DNOP | 113 | 57.9-140 | | %REC | 1 | 9/11/2015 1:36:21 PM | 21186 |
| **EPA METHOD 8260B: VOLATILES SHORT LIST** | | | | | | Analyst: **RAA** | |
| Benzene | ND | 0.050 | | mg/Kg | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Toluene | ND | 0.050 | | mg/Kg | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Ethylbenzene | ND | 0.050 | | mg/Kg | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Xylenes, Total | ND | 0.10 | | mg/Kg | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Surr: 1,2-Dichloroethane-d4 | 93.5 | 70-130 | | %REC | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Surr: 4-Bromofluorobenzene | 78.6 | 70-130 | | %REC | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Surr: Dibromofluoromethane | 100 | 70-130 | | %REC | 1 | 9/10/2015 3:29:06 PM | 21177 |
| Surr: Toluene-d8 | 87.7 | 70-130 | | %REC | 1 | 9/10/2015 3:29:06 PM | 21177 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1509253**

***16-Sep-15***

**Client:** R.T. Hicks Consultants, LTD

**Project:** Paloma Release

| Sample ID | **MB-21206** | SampType: | **MBLK** | TestCode: | **EPA Method 300.0: Anions** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBS** | Batch ID: | **21206** | RunNo: | **28738** | | | | |
| Prep Date: | **9/9/2015** | Analysis Date: | **9/9/2015** | SeqNo: | **871283** | Units: | **mg/Kg** | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 1.5 | | | | | | | | |

| Sample ID | **LCS-21206** | SampType: | **LCS** | TestCode: | **EPA Method 300.0: Anions** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSS** | Batch ID: | **21206** | RunNo: | **28738** | | | | |
| Prep Date: | **9/9/2015** | Analysis Date: | **9/9/2015** | SeqNo: | **871284** | Units: | **mg/Kg** | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | 1.5 | 15.00 | 0 | 94.1 | 90 | 110 | | | |

| Sample ID | **MB-21248** | SampType: | **mblk** | TestCode: | **EPA Method 300.0: Anions** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBS** | Batch ID: | **21248** | RunNo: | **28773** | | | | |
| Prep Date: | **9/10/2015** | Analysis Date: | **9/10/2015** | SeqNo: | **872640** | Units: | **mg/Kg** | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 1.5 | | | | | | | | |

| Sample ID | **LCS-21248** | SampType: | **lcs** | TestCode: | **EPA Method 300.0: Anions** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSS** | Batch ID: | **21248** | RunNo: | **28773** | | | | |
| Prep Date: | **9/10/2015** | Analysis Date: | **9/10/2015** | SeqNo: | **872641** | Units: | **mg/Kg** | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | 1.5 | 15.00 | 0 | 96.3 | 90 | 110 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1509253**

***16-Sep-15***

**Client:** R.T. Hicks Consultants, LTD

**Project:** Paloma Release

| Sample ID **MB-21186** | SampType: **MBLK** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **PBS** | Batch ID: **21186** | RunNo: **28739** |
| Prep Date: **9/8/2015** | Analysis Date: **9/10/2015** | SeqNo: **872207** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | ND | 10 | | | | | | | | |
| Motor Oil Range Organics (MRO) | ND | 50 | | | | | | | | |
| Surr: DNOP | 10 | | 10.00 | | 102 | 57.9 | 140 | | | |

| Sample ID **LCS-21186** | SampType: **LCS** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **LCSS** | Batch ID: **21186** | RunNo: **28739** |
| Prep Date: **9/8/2015** | Analysis Date: **9/10/2015** | SeqNo: **872208** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 60 | 10 | 50.00 | 0 | 119 | 57.4 | 139 | | | |
| Surr: DNOP | 5.9 | | 5.000 | | 117 | 57.9 | 140 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1509253**

***16-Sep-15***

**Client:** R.T. Hicks Consultants, LTD

**Project:** Paloma Release

| Sample ID **lcs-21177** | SampType: **LCS** | TestCode: **EPA Method 8260B: Volatiles Short List** |
|---|---|---|
| Client ID: **LCSS** | Batch ID: **21177** | RunNo: **28737** |
| Prep Date: **9/8/2015** | Analysis Date: **9/9/2015** | SeqNo: **871550** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 1.0 | 0.050 | 1.000 | 0 | 103 | 70 | 130 | | | |
| Toluene | 0.88 | 0.050 | 1.000 | 0 | 87.9 | 70 | 130 | | | |
| Ethylbenzene | 0.95 | 0.050 | 1.000 | 0 | 94.7 | 70 | 130 | | | |
| Xylenes, Total | 2.9 | 0.10 | 3.000 | 0 | 96.7 | 70 | 130 | | | |
| Surr: 1,2-Dichloroethane-d4 | 0.49 | | 0.5000 | | 98.4 | 70 | 130 | | | |
| Surr: 4-Bromofluorobenzene | 0.48 | | 0.5000 | | 96.0 | 70 | 130 | | | |
| Surr: Dibromofluoromethane | 0.52 | | 0.5000 | | 104 | 70 | 130 | | | |
| Surr: Toluene-d8 | 0.45 | | 0.5000 | | 90.1 | 70 | 130 | | | |

| Sample ID **mb-21177** | SampType: **MBLK** | TestCode: **EPA Method 8260B: Volatiles Short List** |
|---|---|---|
| Client ID: **PBS** | Batch ID: **21177** | RunNo: **28737** |
| Prep Date: **9/8/2015** | Analysis Date: **9/9/2015** | SeqNo: **871551** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | 0.050 | | | | | | | | |
| Toluene | ND | 0.050 | | | | | | | | |
| Ethylbenzene | ND | 0.050 | | | | | | | | |
| Xylenes, Total | ND | 0.10 | | | | | | | | |
| Surr: 1,2-Dichloroethane-d4 | 0.48 | | 0.5000 | | 95.2 | 70 | 130 | | | |
| Surr: 4-Bromofluorobenzene | 0.51 | | 0.5000 | | 102 | 70 | 130 | | | |
| Surr: Dibromofluoromethane | 0.52 | | 0.5000 | | 104 | 70 | 130 | | | |
| Surr: Toluene-d8 | 0.45 | | 0.5000 | | 90.1 | 70 | 130 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1509253**

***16-Sep-15***

**Client:** R.T. Hicks Consultants, LTD

**Project:** Paloma Release

| Sample ID | **lcs-21177** | SampType: | **LCS** | | TestCode: | **EPA Method 8015D Mod: Gasoline Range** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSS** | Batch ID: | **21177** | | RunNo: | **28737** | | | | |
| Prep Date: | **9/8/2015** | Analysis Date: | **9/9/2015** | | SeqNo: | **871419** | Units: | **mg/Kg** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Gasoline Range Organics (GRO) | 23 | 5.0 | 25.00 | 0 | 90.2 | 70 | 123 | | | |
| Surr: BFB | 540 | | 500.0 | | 109 | 70 | 130 | | | |

| Sample ID | **mb-21177** | SampType: | **MBLK** | | TestCode: | **EPA Method 8015D Mod: Gasoline Range** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBS** | Batch ID: | **21177** | | RunNo: | **28737** | | | | |
| Prep Date: | **9/8/2015** | Analysis Date: | **9/9/2015** | | SeqNo: | **871420** | Units: | **mg/Kg** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Gasoline Range Organics (GRO) | ND | 5.0 | | | | | | | | |
| Surr: BFB | 550 | | 500.0 | | 109 | 70 | 130 | | | |

| Sample ID | **lcs-21199** | SampType: | **LCS** | | TestCode: | **EPA Method 8015D Mod: Gasoline Range** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSS** | Batch ID: | **21199** | | RunNo: | **28788** | | | | |
| Prep Date: | **9/9/2015** | Analysis Date: | **9/10/2015** | | SeqNo: | **873066** | Units: | **%REC** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Surr: BFB | 550 | | 500.0 | | 109 | 70 | 130 | | | |

| Sample ID | **mb-21199** | SampType: | **MBLK** | | TestCode: | **EPA Method 8015D Mod: Gasoline Range** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBS** | Batch ID: | **21199** | | RunNo: | **28788** | | | | |
| Prep Date: | **9/9/2015** | Analysis Date: | **9/10/2015** | | SeqNo: | **873067** | Units: | **%REC** | | |
| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
| Surr: BFB | 550 | | 500.0 | | 110 | 70 | 130 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

# Sample Log-In Check List

Client Name: RT HICKS  Work Order Number: 1509253  RcptNo: 1

Received by/date: CS 09/04/15

Logged By: **Anne Thorne** 9/4/2015 9:25:00 AM  Anne Thorne

Completed By: **Anne Thorne** 9/8/2015  Anne Thorne

Reviewed By: 09/08/15

## Chain of Custody

| | | | |
|---|---|---|---|
| 1. Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| 2. Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 3. How was the sample delivered? | Client | | |

## Log In

| | | | |
|---|---|---|---|
| 4. Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. Were all samples received at a temperature of >0° C to 6.0°C | Yes ☐ | No ☑ | NA ☐ |
| | Approved by client. | | |
| 6. Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. Are samples (except VOA and ONG) properly preserved? | Yes ☑ | No ☐ | |
| 9. Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA Vials ☑ |
| 11. Were any sample containers received broken? | Yes ☐ | No ☑ | |
| 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) | Yes ☑ | No ☐ | |
| 13. Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | |
| 14. Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. Were all holding times able to be met? (If no, notify customer for authorization.) | Yes ☑ | No ☐ | |

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

## Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

| Cooler No | Temp °C | Condition | Seal Intact | Seal No | Seal Date | Signed By |
|---|---|---|---|---|---|---|
| 1 | 6.9 | Good | Not Present | | | |

# Chain-of-Custody Record

Client: R.T. Hicks

Mailing Address:

Phone #:

email or Fax#: R@rthicksconsult.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: Paloma Release

Project #:

Project Manager: RTH

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 6.9°C

**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. 1509253 | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F,Cl,NO_3,NO_2,PO_4,SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Chloride | | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9.2 | 1504 | Soil | STOCKPILE HT | | | -001 | X | | X | | | | | | | | | X | | | | |
| 9.2 | 1526 | Soil | 98 S 13W 4" | | | -002 | X | | X | | | | | | | | | X | | | | |
| 9.2 | 1554 | Soil | 120 S 10E 0-16" | | | -003 | X | | X | | | | | | | | | X | | | | |
| 9.2 | 1601 | Soil | 140 S 10E 24" | | | -004 | | | | | | | | | | | | X | | | | |
| 9.2 | 1553 | Soil | 120 S 10E 18" | | | -005 | | | | | | | | | | | | X | | | | |
| 92 | 1530 | Soil | 90 S 86E 0-4 | | | -006 | X | | X | | | | | | | | | X | | | | |
| 9.2 | 1553 | Soil | 90 S 86E 9' | | | -007 | | | | | | | | | | | | X | | | | |
| 9.2 | 1522 | Soil | 93 S 05E 12" | | | -008 | X | | X | | | | | | | | | X | | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 9.4 | 925 | Kendall Hall | Celina Sims | 09/04/15 | 0925 |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |

Remarks: Client approved temp. CS 09/04/15

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

*Hall Environmental Analysis Laboratory*
*4901 Hawkins NE*
*Albuquerque, NM 87109*
*TEL: 505-345-3975 FAX: 505-345-4107*
*Website: www.hallenvironmental.com*

October 13, 2015

Randall Hicks

RT HICKS
901 Rio Grande Blvd. NW
Suite F-142
Albuquerque, NM 87104
TEL:
FAX

RE: Paloma OrderNo.: 1510114

Dear Randall Hicks:

Hall Environmental Analysis Laboratory received 4 sample(s) on 10/2/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** RT HICKS
**Client Sample ID:** 104 S 16E 2'
**Project:** Paloma
**Collection Date:** 10/1/2015 1:41:00 PM
**Lab ID:** 1510114-001
**Matrix:** SOIL
**Received Date:** 10/2/2015 12:20:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 1600 | 750 | | mg/Kg | 500 | 10/7/2015 6:47:43 PM | 21731 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | 1200 | 100 | | mg/Kg | 10 | 10/8/2015 3:48:58 PM | 21643 |
| Motor Oil Range Organics (MRO) | 1800 | 500 | | mg/Kg | 10 | 10/8/2015 3:48:58 PM | 21643 |
| Surr: DNOP | 0 | 57.9-140 | S | %REC | 10 | 10/8/2015 3:48:58 PM | 21643 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 5.0 | | mg/Kg | 1 | 10/6/2015 4:30:10 PM | 21666 |
| Surr: BFB | 94.1 | 75.4-113 | | %REC | 1 | 10/6/2015 4:30:10 PM | 21666 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** RT HICKS
**Client Sample ID:** 104 S 16E 4'
**Project:** Paloma
**Collection Date:** 10/1/2015 1:45:00 PM
**Lab ID:** 1510114-002
**Matrix:** SOIL
**Received Date:** 10/2/2015 12:20:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 2500 | 750 | | mg/Kg | 500 | 10/7/2015 7:12:33 PM | 21731 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** RT HICKS
**Client Sample ID:** 104 S 16E 10'
**Project:** Paloma
**Collection Date:** 10/1/2015 1:58:00 PM
**Lab ID:** 1510114-003
**Matrix:** SOIL
**Received Date:** 10/2/2015 12:20:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 100 | 30 | | mg/Kg | 20 | 10/7/2015 7:49:47 PM | 21731 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** RT HICKS
**Client Sample ID:** 94 S 22E 2'
**Project:** Paloma
**Collection Date:** 10/1/2015 3:21:00 PM
**Lab ID:** 1510114-004
**Matrix:** SOIL
**Received Date:** 10/2/2015 12:20:00 PM

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed | Batch |
|---|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **LGT** | |
| Chloride | 3800 | 750 | | mg/Kg | 500 | 10/7/2015 8:27:01 PM | 21731 |
| **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** | | | | | | Analyst: **KJH** | |
| Diesel Range Organics (DRO) | ND | 13 | | mg/Kg | 1 | 10/8/2015 5:51:18 AM | 21643 |
| Motor Oil Range Organics (MRO) | ND | 64 | | mg/Kg | 1 | 10/8/2015 5:51:18 AM | 21643 |
| Surr: DNOP | 114 | 57.9-140 | | %REC | 1 | 10/8/2015 5:51:18 AM | 21643 |
| **EPA METHOD 8015D: GASOLINE RANGE** | | | | | | Analyst: **NSB** | |
| Gasoline Range Organics (GRO) | ND | 5.0 | | mg/Kg | 1 | 10/6/2015 4:53:15 PM | 21666 |
| Surr: BFB | 90.3 | 75.4-113 | | %REC | 1 | 10/6/2015 4:53:15 PM | 21666 |

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1510114**

***13-Oct-15***

**Client:** RT HICKS

**Project:** Paloma

| Sample ID | **MB-21731** | SampType: | **MBLK** | TestCode: | **EPA Method 300.0: Anions** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **PBS** | Batch ID: | **21731** | RunNo: | **29381** | | | | | |
| Prep Date: | **10/7/2015** | Analysis Date: | **10/7/2015** | SeqNo: | **893383** | Units: | **mg/Kg** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | ND | 1.5 | | | | | | | | |

| Sample ID | **LCS-21731** | SampType: | **LCS** | TestCode: | **EPA Method 300.0: Anions** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Client ID: | **LCSS** | Batch ID: | **21731** | RunNo: | **29381** | | | | | |
| Prep Date: | **10/7/2015** | Analysis Date: | **10/7/2015** | SeqNo: | **893384** | Units: | **mg/Kg** | | | |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 14 | 1.5 | 15.00 | 0 | 92.9 | 90 | 110 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1510114**

***13-Oct-15***

**Client:** RT HICKS

**Project:** Paloma

| Sample ID **MB-21652** | SampType: **MBLK** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **PBS** | Batch ID: **21652** | RunNo: **29273** |
| Prep Date: **10/5/2015** | Analysis Date: **10/5/2015** | SeqNo: **890900** Units: **%REC** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Surr: DNOP | 7.9 | | 10.00 | | 78.7 | 57.9 | 140 | | | |

| Sample ID **LCS-21652** | SampType: **LCS** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **LCSS** | Batch ID: **21652** | RunNo: **29273** |
| Prep Date: **10/5/2015** | Analysis Date: **10/5/2015** | SeqNo: **890901** Units: **%REC** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Surr: DNOP | 4.7 | | 5.000 | | 94.7 | 57.9 | 140 | | | |

| Sample ID **MB-21643** | SampType: **MBLK** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **PBS** | Batch ID: **21643** | RunNo: **29273** |
| Prep Date: **10/2/2015** | Analysis Date: **10/7/2015** | SeqNo: **894135** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | ND | 10 | | | | | | | | |
| Motor Oil Range Organics (MRO) | ND | 50 | | | | | | | | |
| Surr: DNOP | 10 | | 10.00 | | 104 | 57.9 | 140 | | | |

| Sample ID **LCS-21643** | SampType: **LCS** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **LCSS** | Batch ID: **21643** | RunNo: **29273** |
| Prep Date: **10/2/2015** | Analysis Date: **10/7/2015** | SeqNo: **894136** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Diesel Range Organics (DRO) | 44 | 10 | 50.00 | 0 | 88.9 | 57.4 | 139 | | | |
| Surr: DNOP | 4.8 | | 5.000 | | 95.7 | 57.9 | 140 | | | |

| Sample ID **MB-21679** | SampType: **MBLK** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **PBS** | Batch ID: **21679** | RunNo: **29273** |
| Prep Date: **10/6/2015** | Analysis Date: **10/8/2015** | SeqNo: **894236** Units: **%REC** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Surr: DNOP | 10 | | 10.00 | | 105 | 57.9 | 140 | | | |

| Sample ID **LCS-21679** | SampType: **LCS** | TestCode: **EPA Method 8015M/D: Diesel Range Organics** |
|---|---|---|
| Client ID: **LCSS** | Batch ID: **21679** | RunNo: **29273** |
| Prep Date: **10/6/2015** | Analysis Date: **10/8/2015** | SeqNo: **894238** Units: **%REC** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Surr: DNOP | 5.6 | | 5.000 | | 112 | 57.9 | 140 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: **1510114**

***13-Oct-15***

**Client:** RT HICKS

**Project:** Paloma

| Sample ID | **MB-21666** | SampType: | **MBLK** | TestCode: | **EPA Method 8015D: Gasoline Range** |
|---|---|---|---|---|---|
| Client ID: | **PBS** | Batch ID: | **21666** | RunNo: | **29332** |
| Prep Date: | **10/5/2015** | Analysis Date: | **10/6/2015** | SeqNo: | **892323** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) | ND | 5.0 | | | | | | | | |
| Surr: BFB | 870 | | 1000 | | 86.6 | 75.4 | 113 | | | |

| Sample ID | **LCS-21666** | SampType: | **LCS** | TestCode: | **EPA Method 8015D: Gasoline Range** |
|---|---|---|---|---|---|
| Client ID: | **LCSS** | Batch ID: | **21666** | RunNo: | **29332** |
| Prep Date: | **10/5/2015** | Analysis Date: | **10/6/2015** | SeqNo: | **892324** Units: **mg/Kg** |

| Analyte | Result | PQL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics (GRO) | 26 | 5.0 | 25.00 | 0 | 103 | 79.6 | 122 | | | |
| Surr: BFB | 940 | | 1000 | | 94.1 | 75.4 | 113 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level. | B | Analyte detected in the associated Method Blank |
| D | Sample Diluted Due to Matrix | E | Value above quantitation range |
| H | Holding times for preparation or analysis exceeded | J | Analyte detected below quantitation limits |
| ND | Not Detected at the Reporting Limit | P | Sample pH Not In Range |
| R | RPD outside accepted recovery limits | RL | Reporting Detection Limit |
| S | % Recovery outside of range due to dilution or matrix | | |

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

# Sample Log-In Check List

Client Name: RT HICKS | Work Order Number: 1510114 | RcptNo: 1

Received by/date: AT 10/02/15

Logged By: Anne Thorne 10/2/2015 12:20:00 PM Anne Thorne

Completed By: Anne Thorne 10/5/2015 Anne Thorne

Reviewed By: 10/05/15

## Chain of Custody

| | | | |
|---|---|---|---|
| 1. Custody seals intact on sample bottles? | Yes ☐ | No ☐ | Not Present ☑ |
| 2. Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 3. How was the sample delivered? | Client | | |

## Log In

| | | | |
|---|---|---|---|
| 4. Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. Were all samples received at a temperature of >0° C to 6.0°C | Yes ☑ | No ☐ | NA ☐ |
| 6. Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. Are samples (except VOA and ONG) properly preserved? | Yes ☑ | No ☐ | |
| 9. Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. VOA vials have zero headspace? | Yes ☐ | No ☐ | No VOA Vials ☑ |
| 11. Were any sample containers received broken? | Yes ☐ | No ☑ | |
| 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) | Yes ☑ | No ☐ | |
| 13. Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | |
| 14. Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. Were all holding times able to be met? (If no, notify customer for authorization.) | Yes ☑ | No ☐ | |

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

## Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

| Cooler No | Temp °C | Condition | Seal Intact | Seal No | Seal Date | Signed By |
|---|---|---|---|---|---|---|
| 1 | 3.3 | Good | Not Present | | | |

# Chain-of-Custody Record

Client: R.T. Hicks

Mailing Address:

Phone #: 238-9515

email or Fax#: R@rthicksconsult.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☑ Standard ☐ Rush _____

Project Name: PALOMA

Project #:

Project Manager: RTH

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.3

**HALL ENVIRONMENTAL ANALYSIS LABORATORY**

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

**Analysis Request**

| Date | Time | Matrix | Sample Request ID | Container Type and # | Preservative Type | HEAL No. 1510114 | BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gas only) | TPH 8015B (GRO / DRO / MRO) | TPH (Method 418.1) | EDB (Method 504.1) | PAH's (8310 or 8270 SIMS) | RCRA 8 Metals | Anions ($F,Cl,NO_3,NO_2,PO_4,SO_4$) | 8081 Pesticides / 8082 PCB's | 8260B (VOA) | 8270 (Semi-VOA) | Chloride | | | | Air Bubbles (Y or N) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/1 | 1341 | Soil | 104 5' 16E 2' | 1 Glass | | 001 | | | X | | | | | | | | | X | | | | |
| 10/1 | 1345 | " | 104 5' 16E 4' | " | | 002 | | | | | | | | | | | | X | | | | |
| 10/1 | 1358 | " | 104 5' 16E 10' | " | | 003 | | | | | | | | | | | | X | | | | |
| 10/1 | 1521 | " | 94 5' 22E 2' | " | | 004 | | | X | | | | | | | | | X | | | | |

| Date: | Time: | Relinquished by: | Received by: | Date | Time |
|---|---|---|---|---|---|
| 10/2 | 1220 | | | 10/02/15 | 1220 |
| Date: | Time: | Relinquished by: | Received by: | Date | Time |

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.