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Date:
March 29, 2012

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Our ref:
TX000836.0004.00004

Subject:
Submittal of the 2012 Annual Groundwater Report for the
Navajo Refining Company, Artesia, New Mexico
EPA Facility NMD048918817

Dear Ms. Monzeglio and Mr. Chavez:

On behalf of Navajo Refining Company, ARCADIS is submitting the *2011 Annual Groundwater Report* for the Artesia, New Mexico Refinery. This submittal includes two bound copies and one electronic copy each for the Hazardous Waste Bureau and the Oil Conservation Division.

If you have any questions regarding this submittal, please feel free to contact Darrell Moore with Navajo Refining at 575.746.8382 or myself at 713.953.4816.

Sincerely,

ARCADIS

Pamela R. Krueger
Senior Project Manager

Copies:
Dave Cobrain, NMED
Robert Combs, Navajo Refining
Johnny Lackey, Navajo Refining

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**Navajo Refining Company**
**Artesia Refinery**

# 2011 Annual Groundwater Report
# RCRA Permit No. NMD048918817
# Discharge Permit GW-028

March 2012

ARCADIS

Johnny Lackey
Senior Environmental Manager
Navajo Refining Company, Artesia Refinery

Pamela Krueger
Senior Project Manager, ARCADIS

**2011 Annual Groundwater Report**

RCRA Permit No. NMD048918817
Discharge Permit GW-028

Prepared for:
New Mexico Environment Department
Hazardous Waste Bureau
and
New Mexico Energy, Minerals and Natural Resources Department - Oil Conservation Division

Prepared by:
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Date:
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## Tables



## Figures

## Appendices (all on compact disc)

## List of Acronyms

| | |
|---|---|
| AOC | Area of Concern |
| CAI | Corrective Action Investigation |
| CFR | Code of Federal Regulations |
| CGWSL | Critical Groundwater Screening Level |
| COCs | Constituents of Concern |
| DO | Dissolved Oxygen |
| DRO | Diesel Range Organics |
| EPA | Environmental Protection Agency |
| EP | Evaporation Ponds |
| FWGMWP | Facility Wide Groundwater Monitoring Work Plan |
| GRO | Gasoline Range Organics |
| HWB | Hazardous Waste Bureau |
| MCL | Maximum Contaminant Level |
| mg/L | milligrams per liter |
| MTBE | Methyl-Tert-Butyl Ether |
| MW | Monitoring Wells |
| NCL | North Colony Landfarm |
| NMED | New Mexico Environment Department |
| NWS | National Weather Service |

| | |
|---|---|
| OCD | Oil Conservation Division |
| ORP | Oxidation-Reduction Potential |
| PCC | Post Closure Permit |
| PSH | Phase-Separated Hydrocarbons |
| RCRA | Resource Conservation and Recovery Act |
| RO | Reserve Osmosis |
| RW | Recovery Wells |
| TDS | Total Dissolved Solids |
| TEL | Tetra Ethyl Lead |
| TPH | Total Petroleum Hydrocarbons |
| VOCs | Volatile Organic Compounds |
| WQCC | Water Quality Control Commission |

## Executive Summary

The Navajo Refining Company (Navajo) owns and operates the Artesia Refinery (Refinery) in Artesia, New Mexico. The facility has been in operation since the 1920s and processes crude oil into asphalt, fuel oil, gasoline, diesel, jet fuel and liquefied petroleum gas. Navajo maintains a groundwater monitoring program according to the requirements of the Post-Closure Care Permit (PCC Permit), which is administered by the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB). The PCC Permit (NMED, 2010b) was modified and re-issued in December 2010 with an effective date of January 14, 2011. The PCC Permit also requires Navajo (the Permittee) to recover phase-separated hydrocarbons (PSH), where present, from the shallow groundwater.

The Refinery is also regulated by the New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD). The OCD issued a renewal to Discharge Permit GW-028 (OCD, 2008) dated August 20, 2008. Among other requirements, the Discharge Permit requires semiannual facility-wide groundwater monitoring and submittal of an annual report summarizing the groundwater monitoring and remediation conducted throughout each year.

An updated Facility Wide Groundwater Monitoring Work Plan (FWGMWP) (ARCADIS, 2010) was submitted to NMED and OCD on October 28, 2010. The FWGMWP incorporates provisions of both the PCC Permit and the Discharge Permit and is updated annually, as required by the PCC Permit. The first semiannual monitoring event of 2011, conducted between March 22 and April 15, 2011, was performed according to the October 2010 FWGMWP, which was approved on November 9, 2010 (NMED, 2010a).

The FWGMWP (ARCADIS, 2011b) was updated and submitted to NMED and OCD on June 28, 2011, as required by the PCC Permit. Approval, with modifications, was received from NMED in a letter dated September 1, 2011 (NMED, 2011b). The second semiannual monitoring event of 2011, conducted between September 6 and September 29, 2011, was performed according to the updated 2011 FWGMWP (ARCADIS, 2011d).

This 2011 Annual Groundwater Report follows the format specified in Appendix E.4 of the PCC Permit and summarizes the activities performed throughout 2011 to comply with the two revisions of the FWGMWP.

The activities performed during 2011 included installation of two monitoring wells as part of the Area of Concern (AOC) Group 3 Corrective Action Investigation (CAI), collection of field data, collection of groundwater samples for chemical analyses, and remediation system monitoring. Some exceptions to the planned groundwater monitoring occurred as described in the body of this report.

Field measurements, analytical data and remediation system documentation are summarized in this report. Maps depicting the groundwater gradient, thickness of PSH, and diesel range organics (DRO), arsenic, benzene and naphthalene groundwater screening level exceedance areas have been provided. Detailed plots of concentrations of constituents of concern (COCs) in each monitoring well over time have been provided as an appendix. Detailed plots of the static water level in each monitoring well versus time have also been provided as an appendix.

The following conclusions are based upon the information obtained in 2011 and comparison to data from prior years:

- Groundwater flow direction and gradient remains consistent with that measured in past years.

- The PSH plumes appear to have changed somewhat between 2010 and 2011, as follows:

    - The thickness of PSH southeast of the North Colony Landfarm (NCL) has decreased somewhat since the end of 2010, but the plume has extended toward the north and south.

    - The extent of PSH in the Tetra Ethyl Lead (TEL) area has decreased.

    - The thickness of PSH in the north Refinery area (MW-97) has fluctuated but the extent of the PSH remained consistent.

    - The thickness of the PSH plume in the south Refinery area appears fairly consistent, with a slight shift to the south of US-82 at KWB-2R. The thicknesses of PSH in this area have fluctuated and appear to fluctuate between seasons.

  - The thickness and extent of the PSH plume east of the Refinery, near Bolton Road showed an increase between 2010 and 2011. The thicknesses of PSH in this plume decreased between the first and second semiannual events of 2011.

  - The thickness and extent of PSH at the western end of the Evaporation Ponds remained consistent between the second semiannual event of 2010 and both events of 2011.

- Concentrations of organic constituents in groundwater have generally remained stable or have declined, with the exception of the benzene concentration east of Bolton Road. The presence of benzene in this area will be confirmed or denied during the 2012 monitoring events.

- The recovery trench system was manually operated during portions of 2011, but not all equipment was operable and therefore the recovery system was not as effective as in previous years.

Navajo is currently designing and implementing an upgrade of the recovery trench system, including installation of separate product and produced groundwater piping, standardized pumps and improved gauges. A copy of the conceptual design for the upgraded system was submitted to NMED and OCD in January 2011 (ARCADIS, 2011a). The detailed design of the upgrades was completed in 2011. Construction of the upgrades to the recovery system began in December 2011 and will be completed in March 2012. The upgraded system will be operated throughout the balance of 2012 and Navajo expects to see improved recovery from the upgraded system.

As per the requirements of the updated PCC Permit, an updated FWGMWP will be submitted in June 2012.

## 1. Introduction

The Navajo Refining Company (Navajo) owns and operates the Artesia Refinery (Refinery) in Artesia, New Mexico (Figure 1). The facility has been in operation since the 1920s and processes crude oil into asphalt, fuel oil, gasoline, diesel, jet fuel and liquefied petroleum gas. The facility is regulated under the Resource Conservation and Recovery Act (RCRA). In October 2003, the Secretary of the New Mexico Environment Department (NMED) issued a Post-Closure Care Permit (PCC Permit) to Navajo for the Artesia Refinery Facility (U.S. Environmental Protection Agency (EPA) ID number NMD048918817). The PCC Permit was modified and re-issued in December 2010 (NMED, 2010b) with an effective date of January 14, 2011.

The PCC Permit authorizes and requires Navajo (the Permittee) to conduct post-closure care at the closed Tetra Ethyl Lead (TEL) surface impoundment and take appropriate actions to achieve RCRA closure of the inactive North Colony Landfarm (NCL) treatment unit and the inactive Evaporation Ponds (EP) at the Artesia Refinery. These areas and the locations of all existing monitoring and recovery wells are shown on Figure 2.

Among other action items, the PCC Permit requires the Permittee to maintain a groundwater monitoring program, which can evaluate the effectiveness of the corrective action program for groundwater and that meets the requirements of 20.4.1.500 NMAC (incorporating 40 Code of Federal Regulations (CFR) Part 264, Subpart F) during the post-closure care period. The PCC Permit also requires the Permittee to recover phase-separated hydrocarbons (PSH), where present, from the shallow groundwater.

The Artesia Refinery is also regulated by the New Mexico Energy, Minerals and Natural Resources Department – Oil Conservation Division (OCD). The OCD issued a renewal to Discharge Permit GW-028 (OCD, 2008) dated August 20, 2009. Among other requirements, the Discharge Permit requires semiannual facility wide groundwater monitoring and submittal of an annual report summarizing the groundwater monitoring and remediation conducted throughout each year.

An updated Facility Wide Groundwater Monitoring Work Plan (FWGMWP) (ARCADIS, 2010) was submitted to NMED and OCD on October 28, 2010. The FWGMWP incorporates provisions of both the PCC Permit and the Discharge Permit and is updated annually, as required by the PCC Permit. The first semiannual monitoring event of 2011, conducted between March 22, 2011 and April 15, 2011, was performed

according to the October 2010 FWGMWP, which was approved on November 9, 2010 (NMED, 2010a).

The FWGMWP (ARCADIS, 2011b) was updated and submitted to NMED and OCD on June 28, 2011, as required by the PCC Permit. Approval, with modifications, was received from NMED in a letter dated September 1, 2011 (NMED, 2011b). The second semiannual monitoring event of 2011, conducted between September 6, 2011 and September 29, 2011, was performed according to the updated 2011 FWGMWP (ARCADIS, 2011d).

This 2011 Annual Groundwater Report follows the format specified in Appendix E.4 of the PCC Permit and summarizes the activities performed throughout 2011 to comply with the two revisions of the FWGMWP.

## 2. Scope of Services

The groundwater monitoring and associated activities performed during 2011 are described in detail in this section. The first semiannual sampling event began on March 22, 2011 and was completed on April 15, 2011. The second semiannual sampling event began on September 6, 2011 and was completed on September 29, 2011.

### 2.1 Monitoring Well Installation

In January 2011, two monitoring wells identified as MW-109 and MW-110 were installed as part of the AOC Group 3 CAI. These wells were installed south of US Highway 82 using a hollow stem auger drill rig. Both wells were installed to a total depth of 30 feet below ground surface (bgs). Well completion logs were included in the AOC Group 3 Corrective Action Investigation Report (ARCADIS, 2011c) dated July 2011 but a copy of these logs has been provided in Appendix A of this report as well.

### 2.2 PSH and Water Level Measurements

At the beginning of each of the two semiannual sampling events, the depth to PSH, depth to water, and total depth in the monitoring and recovery wells was measured. Measurements were made using an oil/water interface probe attached to a measuring tape marked in 0.01-foot increments. The measurements were made in relation to the surveyed datum on each well casing. In the event that the survey datum mark was not visible, measurements were made at the northern side of each well riser which is the default survey datum location. Measurements were recorded on the field data sheets for each event.

Well gauging for the first semiannual sampling event began on March 22, 2011 and was completed on March 25, 2011. No rainfall was recorded at the National Weather Service (NWS) gauging station, located approximately 6 miles south of the Refinery, during this time period. A copy of the NWS data for March 2011 is provided in Appendix B with the field sampling notes for this event.

Well gauging for the second semiannual sampling event began on September 6, 2011 and was completed on September 9, 2011. Due to an oversight, monitoring well KWB-10R was not gauged during the initial gauging event. Fluid levels for this well were collected on September 26, 2011. No rainfall was recorded at the NWS gauging station between September 6 and 9, 2011. However, 2.06 inches of rainfall were

recorded at the gauging station between September 9, 2011 and the September 26, 2011. A copy of the NWS data for September 2011 is provided in Appendix B.

Table 1 summarizes the gauging data collected during both semiannual sampling events for 2011. Figures 3 through 6 depict the potentiometric surface maps for the shallow saturated zone and valley fill zone based on measurements collected during the two semiannual sampling events.

### 2.3 Groundwater Sample Collection and Handling

Groundwater samples were collected during each of the two semiannual sampling events. The wells designated for sample collection during the first semiannual sampling event were listed in the approved FWGMWP dated October 2010. The wells designated for sample collection during the second semiannual sampling event were listed in the approved FWGMWP dated June 2011 and updated October 2011. As per the FWGMWP, if a well designated for sample collection contained more than 0.3 feet of PSH, no sample was collected from that well for that event.

Samples were collected from monitoring wells using either low-flow sampling procedures consistent with the approved work plan or a dedicated ProActive submersible pump and dedicated tubing. Samples were collected from recovery wells using a submersible sampling pump or the recovery pump, depending on the location. Samples collected from irrigation wells were collected from a valve in the irrigation piping as near the well as possible. Table 2 indicates the method by which each well was purged and sampled.

Prior to collection of samples, each monitoring and recovery well was purged by pumping groundwater using either a peristaltic pump or a submersible pump and dedicated tubing. During the well purging process, water quality parameters, including pH, conductivity, dissolved oxygen (DO), temperature and oxidation-reduction potential (ORP), were measured at regular intervals using an instrument such as a YSI multiparameter water quality meter. The water quality parameters were recorded on the field log for each well and a copy of the field logs is provided in Appendix B. The final water quality parameters measured at each well are summarized in Table 2.

Some of the DO measurements recorded during the first semiannual monitoring event of 2011 are suspect. The concentration of DO in air saturated water at sea level is 8.6 milligrams per liter (mg/L). All of the DO measurements above 8 mg/L are believed to be a result of an incorrectly calibrated DO meter. NMED commented on the DO concentrations in the Approval with Modifications letter dated August 12, 2011 (NMED,

2011a) regarding the 2010 annual report. As a result, the field crew was instructed to review all DO readings and to ensure proper calibration of the meter. Measurements over 8 mg/L recorded during the first semiannual event are highlighted in Table 2 as being suspect. The DO measurements collected during the second semiannual event were all below 5 mg/L.

For monitoring wells that were sampled using low-flow procedures, purging was considered complete when at least four of the purge parameters had stabilized. The specified stabilization criteria are +/- 0.2 standard units for pH, +/- 0.2 degrees Celsius ($^{o}$C) for temperature, +/- 0.2 milligrams per liter (mg/L) for DO, +/- 0.02 Siemens per meter (S/m) for specific conductance, and +/- 20 milliVolts (mV) for ORP.

For monitoring or recovery wells purged and sampled using a submersible pump and dedicated tubing, a minimum of three well volumes were purged from the well prior to sampling. Prior to sampling, each well was gauged to determine the depth to water and the total depth of the well. This information was then used to determine the height of the water column within the well casing and the volume of water in the well casing. The abovementioned groundwater quality parameters were also measured and recorded. In the event that the groundwater parameters did not stabilize during purging, a maximum of 10 well volumes were purged from these wells prior to collecting the sample.

Samples were collected by directing the flow of water from the tubing directly into the prepared sample containers. Care was taken to not overflow the containers and potentially remove preservatives from pre-preserved containers.

Collected samples were submitted to an analytical laboratory for analyses of various constituent of concern (COCs) according to the FWGMWP and as discussed in Section 4 of this report. The appropriate containers for each set of analyses were shipped to the field by the laboratory. Sample labels were completed for each container and included the well identifier, the sample identifier, the date and time, the sampler's initials, and the analytical method(s) to be performed. Glass sample containers were placed in padded packing sleeves to prevent breakage. Sample containers were packed with ice in a shipping container. Shipping containers were sent overnight via Federal Express to the analytical laboratory.

Chain of custody forms were completed for each shipment to indicate which samples were included in that shipment and what analyses to perform for each sample. Copies of the chain of custody forms are included in Appendix C with the analytical data reports.

### 2.4 Equipment Decontamination Procedures

The oil/water interface probes used to gauge the PSH and water levels were decontaminated between each well. Decontamination of the probes consisted of washing the probe and the attached tape measure in a mixture of water and non-phosphate detergent (Alconox™). The equipment was then rinsed with clean water. The clean water used for washing and rinsing was obtained from the Refinery reverse osmosis water system.

The flow-through cell used for low-flow purging and sample collection was decontaminated between each well. The probes of the water parameter meters were also decontaminated between each well. Decontamination of this equipment included submersing the flow-through cell in a mixture of water and non-phosphate detergent (Alconox™) and washing the cell with a soft brush and submersing the probe end of the meters in the soapy water mixture and brushing the end of the probe with a soft brush. The equipment was then rinsed with clean water from the Refinery reverse osmosis water system.

The submersible pump used for purging and sample collection from wells where low-flow sampling procedure is not practical was decontaminated between each use. The pump was placed in a mixture of water and non-phosphate detergent (Alconox™) and allowed to run for at least one minute to flush all groundwater through the pump. The outer portions of the pump were brushed using a soft brush. The pump was then rinsed in clean water from the Refinery reverse osmosis system.

Dedicated tubing was used for sample collection from each well and thus no decontamination of sample collection tubing was required. The dedicated tubing was left in the well between sampling events, with the upper portion coiled to ensure that the lower portion did not remain in the water column. At the beginning of each sampling event, the tubing was inspected and replaced if staining or mold was noted.

### 2.5 Investigation Derived Waste

All purge water and decontamination liquids were contained in a portable tank in the sampling trailer. The liquids were disposed of daily in the Refinery process wastewater system upstream of the API separator by releasing the liquids into a sump designated by Refinery personnel, typically the sump beneath the north process unit flare.

Solid wastes included disposable gloves, paper towels, plastic bags, and used tubing. All solid waste was bagged and placed in the Refinery trash receptacles for later disposal.

### 2.6 Exceptions to Groundwater Monitoring Work Plan

Some exceptions to the planned groundwater monitoring occurred, as follows:

- As described in Section 2.1, monitoring wells MW-109 and MW-110 were installed in January 2011 as part of the AOC Group 3 CAI. Groundwater samples were collected from these wells in January 2011 as part of the AOC Group 3 CAI, then again in April and September 2011 as part of the semiannual monitoring program.

- First Semiannual Sampling Event (March to April 2011):

    - KWB-P2 was not sampled due to low water volume in the casing. This well is actually a piezometer and had less than 4 feet of water present when gauged. The well purges completely dry using either low-flow or submersible pumps.

    - NCL-34B is listed in the FWGMWP but does not exist. Therefore, no sample was collected from this well.

    - RA 314 was not sampled because the well has been removed from service and no pump or power was available. Navajo does not own this irrigation well and has no authority to require access for sample collection.

    - RW-6, RW-11 and RW-12 were not sampled because they were dry.

- Second Semiannual Sampling Event (September 2011):

    - KWB-2R and KWB-9 were gauged but were not sampled because the landowner denied access to the field crew. A sample would not have been collected from KWB-2R due to the thickness of PSH present.

    - RA-1227 was not sampled because the landowner denied access.

- KWB-P2 was not sampled due to low water volume in the casing. This well is actually a piezometer and had less than 3 feet of water present when gauged. The well purges completely dry using either low-flow or submersible pumps.

- MW-42 was not gauged or sampled because the well has been damaged.

- NCL-32 was not sampled because the well purged completely dry using low-flow pumps.

- NCL-34B is listed in the FWGMWP but does not exist. Therefore, no sample was collected from this well.

## 3. Regulatory Criteria

Regulatory standards used to evaluate the data collected for the groundwater monitoring program are based on the presumption that the shallow groundwater might be used as a source of drinking water. The screening level value used for each COC is the lower value of either the New Mexico Water Quality Control Commission (WQCC) standards from 20.6.2.3103 NMAC or the Maximum Contaminant Level (MCL) from the National Primary Drinking Water Standards. For COCs where neither a WQCC standard or MCL exists, the screening level value used is the NMED Tap Water Standard listed in the NMED *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012). For total petroleum hydrocarbons (TPH), the TPH Screening Guidelines for Potable Groundwater for unknown oil included in the NMED *Risk Assessment Guidance for Site Investigations and Remediation* has been used (NMED, 2012), as corrected by subsequent correspondence from NMED.

Table 3 lists the screening levels from each source and provides a summary of the critical groundwater screening level (CGWSL) for each COC. The CGWSL for each COC is also provided in the data summary tables, discussed later in this report.

## 4. Monitoring Results

Groundwater monitoring events occurred semiannually, as required by the PCC Permit and the Discharge Permit. This section describes the results of the field activities conducted according to the Workplans.

### 4.1 Groundwater Gauging Results

The first semiannual sampling event began on March 22, 2011 and was completed on April 15, 2011. The second semiannual sampling event began on September 6, 2011 and was completed on September 29, 2011. As discussed in Section 2, the depth to PSH (if present) and depth to water was measured in each well at the beginning of each sampling event. These measurements are summarized in Table 1.

The measurements of depth to groundwater and depth to PSH (if present) were used to construct groundwater gradient maps and PSH thickness maps for both semiannual events. For those wells where PSH is present, the groundwater elevation measurement was adjusted to determine the potentiometric surface elevation, assuming a specific gravity of 0.8 for the PSH. Plots of the groundwater elevation in each well through time have been provided at the request of OCD and are contained on CD in Appendix D.

The groundwater potentiometric surface is depicted for the first semiannual event in Figures 3 and 4 for the shallow saturated zone and for the valley fill zone, respectively. The groundwater potentiometric surface is depicted for the second semiannual event in Figures 5 and 6 for the shallow saturated zone and for the valley fill zone, respectively. As shown in these figures, the groundwater flow direction beneath the Refinery is consistently to the east, toward the Pecos River. The groundwater flow direction beneath the Evaporation Ponds is generally to the southeast.

The gradient through the Refinery is not uniform and appears to be influenced slightly by the recovery pumps, specifically in the area around RW-1 and RW-2 (northwest portion of refinery), RW-4 and RW-5 (southern portion of refinery), RW-15 (southeastern corner), MW-30 (northeast corner) during both semiannual gauging events. To the east of the Refinery, during the second semiannual gauging event, the gradient near RW-11 and RW-12 exhibits some non-uniformity. The gradient becomes more flat in the area beneath the Evaporation Ponds.

### 4.2 Phase-Separated Hydrocarbons

Isopleths of PSH thickness are shown in Figure 7 for the first semiannual event and in Figure 8 for the second semiannual event. As shown, there are six distinct areas where PSH is present: three separate areas in the northern portion of the Refinery (NCL, TEL and north Refinery areas), the southeastern portion of the Refinery, east of the Refinery near Bolton Road, and on the western end of the Evaporation Ponds near the former discharge point into Pond 1. Each area of interest is discussed in the following subsections. Additional information on recovery activities is provided in Section 6.

#### 4.2.1 NCL Area

As shown in Table 1 and in Figures 7 and 8, PSH was present in NCL-34A at thickness of 5.36 and 5.87 feet during the first and second semiannual events of 2011, respectively. PSH has not historically been present in this well.

The PSH is also present south and southeast of the NCL. As shown in Table 1 and Figures 7 and 8, PSH was present in MW-67, MW-94, RW-7 and RW-8 during both semiannual events of 2011. The PSH thickness decreased between the first and second semiannual events in RW-7 and RW-8 from 2.4 to 0.93 feet in RW-7 and from 3.23 to 0.65 feet in RW-8. The PSH thickness increased in MW-67 and MW-94 between the first and second semiannual event from 1.01 to 3.27 feet in MW-67 and from 6.5 to 7.83 feet in MW-94. PSH has not historically been present in RW-7 or MW-67.

In September 2010, an increase in PSH thickness in MW-94 was observed and attributed to leaking underground piping in the area. It is possible that this leak led to the presence of PSH in NCL-34A, RW-7 and MW-67, since PSH has not been observed in these wells in the past. PSH is being recovered from MW-94, RW-7 and RW-8 routinely by bailing and/or pumping. The recovered PSH is placed in the Refinery waste oil system for recycling. The wells in this area will continue to be monitored to evaluate the effectiveness of the recovery efforts.

#### 4.2.2 TEL Area

As shown in Table 1 and Figures 7 and 8, no PSH was measured in the actual TEL wells in either semiannual event in 2011, but PSH was measured with a thickness of 0.05 and 0.03 feet in MW-39 just northeast of well TEL-1 during the first and second

semiannual events, respectively. The measured thicknesses of PSH in MW-39 are consistent with historic data.

#### 4.2.3 Evaporation Ponds Area

As shown in Table 1 and Figures 7 and 8, PSH is present in MW-85 and MW-86, both of which are located near the original discharge point in Evaporation Pond 1. The PSH thickness measured in March 2011 was 1.4 and 1.48 feet in MW-85 and MW-86, respectively. In September 2011, the PSH thickness was 1.43 and 1.0 feet in MW-85 and MW-86, respectively.

PSH is removed from both of these two wells routinely by bailing and is placed in the Refinery waste oil system for recycling.

#### 4.2.4 Three Mile Ditch

As shown in Table 1 and in Figures 7 and 8, no measurable PSH was present in any wells along Three Mile Ditch during 2011.

#### 4.2.5 North Refinery Area

As shown in Table 1 and Figures 7 and 8, PSH was present in RW-1, RW-2, MW-92, MW-97 and MW-105 in March 2011 with reported thicknesses of 0.05, 0.3, 0.05, 6.41 and 0.42 feet, respectively. In September 2011, PSH was present in RW-1, RW-2, MW-92, MW-97 and MW-105 with reported thicknesses of 0.05, 1.01, 0.86, 3.57, and 0.61 feet, respectively.

Prior to 2011, MW-92 has not contained measurable PSH. The PSH thickness measured in MW-97 showed an increase between September 2010 (2.87 feet) and March 2011 (6.41 ft). Investigations in the area did not indicate the presence of any obvious leaks.

PSH is being recovered from MW-97, RW-1 and RW-2 routinely by bailing and/or pumping. The recovered PSH is placed in the Refinery waste oil system for recycling. The wells in this area will continue to be monitored to evaluate the effectiveness of the recovery efforts.

4.2.6 South Refinery Area

As shown in Table 1 and Figures 7 and 8, PSH was present in RW-4, RW-5, RW-15, KWB-2R, KWB-4, KWB-5, KWB-6, MW-48, MW-64, MW-65 and MW-102 in March 2011 with reported thicknesses of 0.01, 1.23, 1.09, 0.02, 2.43, 0.04, 2.16, 0.25, 1.42, 3.32 and 2.47 feet, respectively. PSH was also present in RW-4, RW-5, RW-15, KWB-2R, KWB-4, KWB-5, KWB-6, MW-48, MW-64, MW-65 and MW-102 in September 2011 with reported thicknesses of 0.09, 0.75, 0.44, 0.16, 0.03, 0.04, 0.34, 0.1, 1.33, 1.87 and 2.57 feet, respectively.

In general, while the thickness of PSH in specific wells or trenches in this area has fluctuated, there has not been an overall change in the shape of this plume.

PSH is removed from this plume routinely by bailing and/or pumping. The recovered PSH is placed in the Refinery waste oil system for recycling.

4.2.7 Field East of Refinery

As shown in Table 1 and Figures 7 and 8, PSH is present in RW-13, RW-14, KWB-8 and KWB-10R in March 2011 with reported thicknesses of 1.27, 1.84, 3.59 and 0.43 feet, respectively. PSH was also present in RW-13, RW-14, KWB-8 and KWB-10R in September 2011 with reported thicknesses of 0.03, 0.06, 0.87 and 0.34 feet, respectively.

PSH is removed from this plume routinely by bailing and/or pumping, primarily from the “Chase well”, which is located just east of Bolton Road. The recovered PSH is placed in the Refinery waste oil system for recycling.

## 5. Chemical Analytical Data

### 5.1 Sample Analyses

The samples collected during the first semiannual sampling event conducted in March and April 2011 and the second semiannual event conducted in September 2011 were analyzed for various COCs, according to the approved FWGMWPs dated October 2010 and June 2011. The COCs and analytical methods conducted for the first and second semiannual sampling events included the following:

- TPH Diesel Range Organics (DRO) by Method 8015 Modified;
- TPH Gasoline Range Organics (GRO) by Method 8015 Modified;
- Volatile Organic Compounds (VOCs) by Method 8260;
- Metals by Methods 6020 and 7470. The standard analyte list included analysis of arsenic, barium, chromium, iron, lead, manganese and selenium. In select wells, an additional analyte list included analysis of mercury, nickel, and vanadium;
- Cyanide by Method 4500;
- Major cations and anions (calcium, chloride, fluoride, potassium, sodium, sulfate) by Methods 6020 and 300;
- Nitrates/nitrites (as nitrogen) by Method 300;
- Total dissolved solids (TDS) by Method 2540.

Not every sample was analyzed by every method listed above. The specific analytical suite chosen for each sample was based on the October 2010 and June 2011 FWGMWPs.

The laboratory analytical reports are included in electronic format in Appendix C.

### 5.2 Data Validation

The analytical data were reviewed and validated following the guidelines of the PCC Permit. The data validation and a discussion of any data quality exceptions have been included on CD in Appendix E. Data qualifier flags were added to the data based on the data validation results and are included in the tabulated data presented in Appendix C.

Although some data quality exceptions were noted, the data are generally usable for the purpose intended.

### 5.3 Discussion of Analytical Data

The PCC Permit requires that this report include the analytical data for the current monitoring event and three prior sampling events. Because some wells are sampled semiannually, some wells are sampled annually and some wells are sampled biennially, the timeframe required to provide data for three prior sampling events varies by well. In order to simplify the data presentation, the monitoring data for 2009 through 2011 are tabulated in Appendix C for all wells sampled and for all compounds analyzed. This provides data for three prior events for the majority of the wells and at least two prior events for those wells sampled annually. The CGWSL is provided at the top of the data table and exceedances of the CGWSL are highlighted in yellow. The data are presented by well numeric order in the tables in Appendix C. The tables have been divided by major analytical group.

Table 4 provides a summary of the analytical data for the wells sampled during 2011, sorted by the area in which the well is located. Table 4 includes the following subset of the compounds analyzed:

- GRO;
- DRO;
- Total metals (arsenic, barium, chromium, iron, lead, manganese, mercury, nickel, selenium and vanadium);
- VOCs (compounds that have had at least one detected value reported above the CGWSL in more than one well);

- Cyanide;
- Major cations and anions (calcium, chloride, fluoride, potassium, sodium and sulfate); and
- Water quality parameters (TDS and nitrate/nitrite).

Data from 2009 through 2011 are provided in Table 4 in order to provide comparison to at least three prior sampling events for those wells that are sampled semiannually. The CGWSL used to evaluate the results are presented at the top of the table and concentrations of COCs that exceed the screening levels are highlighted.

As required by the Discharge Permit, historic concentrations from 2004 through 2011 of select COCs that have consistently been detected at concentrations above the groundwater screening levels in samples from wells at the site are presented in trend plots provided on a CD in Appendix D. These plots are organized by well within major areas of interest and include trend plots for the following indicator COCs:

- GRO
- DRO
- Benzene
- Ethylbenzene
- Toluene
- Total Xylenes
- Methyl-tert-butyl ether (MTBE)
- Naphthalene
- Arsenic

Appendix D also includes trend plots of water level elevations.

Figures 9 through 16 depict the extent of the groundwater screening level exceedance zones for the following major COCs for both the first and second semiannual 2011 sampling events:

- DRO
- Arsenic
- Benzene
- Naphthalene

There have been slight changes in the concentrations of COCs over time, but the general shape of the dissolved phase plumes did not change in 2011, with the exception of benzene. The concentration of dissolved phase benzene in a sample from KWB-7 was above the CGWSL, which extended the plume to the east of Bolton Road. Benzene has not been detected in samples from this well historically. The presence of benzene will be confirmed or denied during the next scheduled sampling event, which will be in March 2012.

The analytical results for 2011 are discussed in the following subsections by major area of interest.

### 5.3.1 NCL Area

Groundwater monitoring beneath and near the closed NCL is on-going. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from wells in and near the NCL area, as discussed in the following subsections.

#### *5.3.1.1 DRO*

Samples were collected from eight wells in and near the NCL during the first semiannual sampling event and analyzed for DRO. These wells included NCL-31, NCL-33, NCL-44, NCL-49, MW-18, MW-54A, MW-54B, and MW-108. DRO concentrations in samples collected from NCL-49, MW-18 and MW-54B were below the CGWSL while the DRO concentrations from the other five samples were above the CGWSL.

Samples were collected from seven wells in and near the NCL during the second semiannual sampling event and analyzed for DRO. These wells included NCL-31,

NCL-33, NCL-44, NCL-49, MW-18, MW-54A, and MW-108. The DRO concentration in the samples collected from NCL-31, NCL-44, NCL-49 and MW-18 were below the CGWSL while the DRO concentrations in the other three samples were above the CGWSL.

Concentrations in individual wells fluctuate slightly between sampling events, but demonstrate an overall stable trend.

*5.3.1.2 VOCs*

Samples were collected from eight wells in and near the NCL and analyzed for VOCs during the first semiannual sampling event. These wells included NCL-31, NCL-33, NCL-44, NCL-49, MW-18, MW-54A, MW-54B, and MW-108. Benzene and 1,2,4-Trimethlybenzene concentrations exceed the CGWSLs in the sample collected from MW-108. The concentrations for benzene and 1,2,4-trimethlybenzene are below the CGWSLs in samples from all of the other wells in and near the NCL area.

Samples were collected from seven wells in and near the NCL during the second semiannual sampling event and analyzed for VOCs. These wells included NCL-31, NCL-33, NCL-44, NCL-49, MW-18, MW-54A, and MW-108. Benzene and 1,2,4-trimethlybenzene concentrations exceed the CGWSLs in the sample collected from MW-108. The concentration of benzene and 1,2,4-trimethlybenzene are below the CGWSLs in samples from all of the other wells in and near the NCL area.

The concentrations of VOCs fluctuate between sampling events but demonstrate an overall stable trend.

*5.3.1.3 Total Metals*

The same samples collected from wells in and near the NCL during the first and second semiannual events that were analyzed for DRO were also analyzed for the standard analyte list for total metals identified in Section 5.1 (arsenic, barium, chromium, iron, lead, manganese and selenium). Additionally, well MW-18 was sampled for the additional analyte list for total metals identified in Section 5.1 (mercury, nickel and vanadium) during both semiannual events. Well NCL-31 was inadvertently sampled for nickel and vanadium during the first semiannual event and the results have been included in the Table 4.

No exceedances of the CGWSL were present in any of the samples collected from the wells in and near the NCL in 2011 for barium, chromium, lead, mercury, nickel, selenium or vanadium. There were exceedances of the CGWSL for arsenic, iron and manganese as follows:

- The reported concentration of arsenic exceeded the CGWSL in samples collected from well NCL-44 during both the first and second semiannual events.

- The reported concentrations of iron exceeded the CGWSL in samples collected from NCL-33 and NCL-44 during both the first and second semiannual events.

- The reported concentrations of manganese exceeded the CGWSL in samples collected from wells NCL-31, NCL-44 and MW-54A during both the first and second semiannual events.

#### *5.3.1.4 Water Quality Parameters*

Concentrations of chloride, fluoride, sulfate and TDS exceed the respective CGWSL in samples from various wells in and near the NCL. The reported concentrations of these constituents exhibit an overall stable trend, except for the TDS concentrations in samples from MW-108 which appear to be increasing slightly.

### 5.3.2 TEL Area

Groundwater monitoring beneath the closed TEL impoundment is ongoing. Samples were collected from the four TEL wells (TEL-1, TEL-2, TEL-3 and TEL-4) during both semiannual monitoring events. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from the TEL wells, as discussed in the following subsections.

#### *5.3.2.1 GRO*

GRO was reported above detection limits in samples from all four of the TEL wells. The NMED TPH guidance document does not provide a screening value for GRO, but indicates that individual VOCs should be analyzed. The reported concentrations of GRO fluctuate through time, but in general show a declining trend over the past three years in samples from TEL-1, TEL-3 and TEL-4. The reported concentrations of GRO appear to be stable in samples from TEL-2.

*5.3.2.2 DRO*

Reported concentrations for DRO exceed the CGWSL in samples from all four of the TEL wells. Concentrations in samples from individual wells fluctuate between sampling events, but demonstrate an overall stable to slightly declining trend.

*5.3.2.3 VOCs*

Various VOCs were detected in samples from the four TEL wells at concentrations above the respective CGWSLs, as follows:

- Benzene was not detected in the samples collected from TEL-1. Benzene concentrations reported for samples collected from TEL-2, TEL-3 and TEL-4 exceeded the CGWSL.

- 1,2,4-Trimethylbenzene was not detected in the samples collected from TEL-1. 1,2,4-Trimethylbenzene was reported at concentrations above the CGWSL for samples collected from TEL-2, TEL-3, and TEL-4.

- MTBE was either not detected or was detected at concentrations below the CGWSL in the samples collected from the TEL-1, TEL-2, and TEL-3. The reported concentrations of MTBE in the samples collected from TEL-4 were above the CGWSL.

*5.3.2.4 Total Metals*

Samples were collected from the four TEL wells and analyzed for the standard metals analyte list identified in Section 5.1 including: arsenic, barium, chromium, iron, lead, manganese, mercury, and selenium.

No exceedances of the CGWSL have been reported during the past three years for barium, iron, lead, mercury, or selenium in samples from any of the four TEL wells. No exceedances of the CGWSL were reported for arsenic in 2011. The reported concentration of manganese was above the CGWSL in the sample collected from TEL-4 during the first semiannual event but below the CGWSL for samples from the other three TEL wells. The reported concentrations of chromium and manganese were above the CGWSL in the sample collected from TEL-4 during the second semiannual event but were below the CGWSL for samples from the other three TEL wells. The chromium and manganese concentrations reported for the samples from TEL-4 collected in the first and second semiannual events were similar to concentrations

reported for previous samples from this well but the concentrations appear to be fluctuating.

*5.3.2.5 Water Quality Parameters*

Concentrations of chloride, fluoride, sulfate and TDS exceed the respective CGWSL in samples from various wells in the TEL area. The reported concentrations of these constituents exhibit an overall stable trend except for slight increases in fluoride concentrations observed in samples from TEL-3 and TEL-4 over the past three years.

5.3.3 Evaporation Ponds

Groundwater monitoring beneath the inactive former Evaporation Ponds is ongoing. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from the Evaporation Ponds wells, as discussed in the following subsections.

*5.3.3.1 GRO*

Samples were collected from 43 wells in and around the Evaporation Ponds and analyzed for GRO during the first semiannual sampling event. These wells included MW-2A, MW-3, MW-4A, MW-4B, MW-5A, MW-5B, MW-6A, MW-6B, MW-7A, MW-7B, MW-10, MW-11A, MW-11B, MW-15, MW-18B, MW-22A, MW-22B, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-79, MW-80, MW-81, MW-82, MW-83, MW-84, MW-87, MW-88, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7A, OCD-7B, OCD-8A, and OCD-8B. GRO concentrations were above detection limits in samples collected from 27 of the 43 wells.

Samples were collected from 27 wells in and around the Evaporation Ponds and analyzed for GRO during the second semiannual sampling event. These wells included MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-22A, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-79, MW-83, MW-84, MW-87, MW-88, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7A, and OCD-8A. GRO concentrations were above detection limits in samples collected from 20 of the 27 wells.

The NMED TPH guidance document does not provide a screening value for GRO, but indicates that individual VOCs should be analyzed. The reported concentrations of GRO fluctuate through time, but in general show a stable or decreasing trend over the past three years.

*5.3.3.2 DRO*

Samples were collected from 45 wells in and around the Evaporation Ponds and analyzed for DRO during the first semiannual sampling event. These wells in included MW-1R, MW-2A, MW-3, MW-4A, MW-4B, MW-5A, MW-5B, MW-6A, MW-6B, MW-7A, MW-7B, MW-10, MW-11A, MW-11B, MW-15, MW-18A, MW-18B, MW-22A, MW-22B, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-79, MW-80, MW-81, MW-82, MW-83, MW-84, MW-87, MW-88, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7A, OCD-7B, OCD-8A and OCD-8B. The reported DRO concentrations were above the CGWSL in 31 of the samples collected from these 45 wells.

Samples were collected from 28 wells in and around the Evaporation Ponds and analyzed for DRO during the second semiannual sampling event. These wells in included MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-18A, MW-22A, MW-70, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-79, MW-83, MW-84, MW-87, MW-88, OCD-1R, OCD-2A, OCD-3, OCD-4, OCD-5, OCD-6, OCD-7A and OCD-8A. The reported DRO concentrations were above the CGWSL in 19 of the samples collected from these 28 wells.

In general, the DRO concentrations in the groundwater samples in the Evaporation Ponds area exhibit a stable or declining trend.

*5.3.3.3 VOCs*

Samples collected from the 45 wells in and around the Evaporation Ponds during the first semiannual event that were analyzed for DRO were also analyzed for VOCs. Samples collected from the 28 wells in and around the Evaporation Ponds during the second semiannual event that were analyzed for DRO were also analyzed for VOCs.

Benzene is the only VOC reported at concentrations above the CGWSL in samples collected from wells in and near the Evaporation Ponds. Benzene concentrations exceeded the CGWSL in samples collected from MW-15 during the first semiannual event and from MW-77 during the second semiannual event. Benzene concentrations exceeded the CGWSL in samples collected previously from MW-78 and MW-83 but benzene was not detected in the samples collected from these wells in 2011.

No VOCs were detected in any of the samples collected during 2011 from nine wells completed in the underlying valley fill zone in the Evaporation Ponds area.

*5.3.3.4 Total Metals*

Samples collected from the 45 wells in and around the Evaporation Ponds during the first semiannual event that were analyzed for DRO were also analyzed for the standard analyte list for total metals identified in Section 5.1 (arsenic, barium, chromium, iron, lead, manganese and selenium). During the first semiannual event, three wells, including MW-18A, MW-77, and OCD-8A, were sampled for the additional analyte list for total metals identified in Section 5.1 (mercury, nickel and vanadium).

Samples collected from the 28 wells in and around the Evaporation Ponds during the second semiannual event that were analyzed for DRO were analyzed the standard analyte list for total metals. During the second semiannual event three wells, including MW-18A, MW-77, OCD-8A, were sampled for the additional analyte list for total metals (mercury, nickel and vanadium).

No exceedances of the CGWSL were present in any of the samples collected from the wells in and near the Evaporation Ponds in 2011 for barium, chromium, lead, mercury, nickel, selenium or vanadium. There were exceedances of the CGWSL for arsenic, iron and manganese as follows:

- For the first semiannual sampling event, arsenic concentrations were above the CGWSL in samples collected from 22 of the 45 wells in and near the Evaporation Ponds. For the second semiannual sampling event, arsenic concentrations were above the CGWSL in samples collected from 16 of the 28 wells in and near the Evaporation Ponds.

- For the first semiannual sampling event, iron concentrations were above the CGWSL in samples collected from 28 of the 45 wells in and near the Evaporation Ponds. For the second semiannual sampling event, iron concentrations were above the CGWSL in samples collected from 21 of the 28 wells in and near the Evaporation Ponds.

- For the first semiannual sampling event, manganese concentrations were above the CGWSL in samples collected from 41 of the 45 wells in and near the Evaporation Ponds. For the second semiannual sampling event, manganese concentrations were above the CGWSL in samples collected from 27 of the 28 wells in and near the Evaporation Ponds.

*5.3.3.5 Cyanide*

Samples collected from three select wells (MW-18A, MW-77 and OCD-8A) in and downgradient from the Evaporation Ponds were analyzed for cyanide. No detectable concentrations of cyanide were present in the samples collected from these wells.

*5.3.3.6 Water Quality Parameters*

Samples collected from the 45 wells in and around the Evaporation Ponds during the first semiannual event that were analyzed for DRO were also analyzed for water quality parameters. During the second semiannual event, samples collected from 15 of the 28 wells in and around the Evaporation Ponds that were analyzed for DRO were also analyzed for water quality parameters. These wells included MW-2A, MW-3, MW-4A, MW-5A, MW-7A, MW-10, MW-18A, MW-72, MW-73, MW-74, MW-75, MW-76, MW-77, MW-79 and MW-83.

Concentrations of chloride, fluoride, sulfate and TDS exceed the respective CGWSL in various wells in and around the Evaporation Ponds. The reported concentrations of these constituents exhibit an overall stable trend.

5.3.4 Three Mile Ditch

Groundwater monitoring along the inactive, backfilled Three Mile Ditch is ongoing. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from the Three Mile Ditch wells, as discussed in the following subsections.

*5.3.4.1 GRO*

Samples were collected from wells MW-8 and MW-21 along Three Mile Ditch and analyzed for GRO during the first and second semiannual event. GRO was not detected above the laboratory detection limit for any of the samples collected from these wells during either sampling event.

*5.3.4.2 DRO*

Samples were collected from 10 wells along Three Mile Ditch and analyzed for DRO during the first semiannual sampling event. These wells included MW-8, MW-16, MW-20, MW-21, MW-25, MW-26, MW-27, MW-68, MW-71 and MW-89. Samples were collected from three wells along Three Mile Ditch and analyzed for DRO during the second semiannual sampling event. These wells included MW-8, MW-21 and MW-71.

DRO was not detected above the CGWSL in any samples collected from wells along Three Mile Ditch. The only reported detection of DRO above the laboratory detection limit was in the sample collected from MW-89 in April 2011.

During the April 2011 sampling event, the reported concentration of DRO in the sample collected from MW-26 exceeded the CGWSL. This detection appears to be an anomaly because DRO was not detected in the sample from MW-26 during the April 2011 event.

*5.3.4.3 VOCs*

The same samples collected from wells along Three Mile Ditch that were analyzed for DRO were also analyzed for VOCs. In addition, the samples collected from NP-1 during both semiannual sampling events and from NP-6 during the first semiannual sampling event were analyzed for VOCs.

MTBE is the only VOC reported at concentrations above the CGWSL in samples collected from wells along Three Mile Ditch. The reported MTBE concentration exceeded the CGWSL in the sample collected from NP-1 in April 2011, but was below the CGWSL in the sample collected from NP-1 in September 2011. The MTBE concentration in this well has been stable since 2009. MTBE has not been detected at concentrations exceeding the CGWSL in any of the samples collected from other wells along Three Mile Ditch.

*5.3.4.4 Total Metals*

The same samples collected from wells along Three Mile Ditch during the first and second semiannual events that were analyzed for DRO were also analyzed for the standard analyte list for total metals identified in Section 5.1 (arsenic, barium, chromium, iron, lead, manganese and selenium). Additionally, wells MW-21 and MW-71 were sampled for the additional analyte list for total metals identified in Section 5.1 (mercury, nickel and vanadium) during the first semiannual event. Well MW-71 was also sampled for the additional analyte list during the second semiannual event.

No exceedances of the CGWSL were present in any of the samples collected from the wells along Three Mile Ditch in 2011 for arsenic, barium, chromium, lead, mercury, nickel, or vanadium. The reported concentrations of two metals were above the CGWSL, as follows:

- The reported concentrations of manganese exceeded the CGWSL in samples from wells MW-8 and MW-21 during both the first and second semiannual event. The reported concentration of manganese in the sample from well MW-89 exceeded the CGWSL in April 2011. The concentration of manganese has been stable in MW-8 and MW-21 since October 2010 (when analysis of manganese began). Samples from MW-89 have not previously been analyzed for manganese.

- The concentration of selenium reported in the sample collected from well MW-21 during September 2011 exceeded the CGWSL; however all other reported concentrations of selenium in samples collected from wells along Three Mile Ditch were below the CGWSL. The concentration of selenium in samples collected from MW-21 show an increasing trend over the past three years.

*5.3.4.5 Cyanide*

Samples collected from well MW-71 were analyzed for cyanide. Cyanide was not detected in the samples collected from this well.

*5.3.4.6 Water Quality Parameters*

The same samples collected from wells along Three Mile Ditch that were analyzed for DRO were also analyzed for water quality parameters. Additionally, NP-1 was analyzed for water quality parameters during the first semiannual event. Concentrations of chloride, fluoride, sulfate and TDS exceed the respective CGWSL in various wells along Three Mile Ditch. The reported concentrations of these constituents exhibit an overall stable trend.

5.3.5 North Refinery Area

Groundwater monitoring in the northern portion of the active Refinery is ongoing. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from the northern portion of the Refinery, as discussed in the following subsections.

*5.3.5.1 GRO*

Samples were collected from 19 wells in the north Refinery area and analyzed for GRO during the first semiannual sampling event. These wells included MW-23, MW-29, MW-40, MW-41, MW-42, MW-43, MW-55, MW-59, MW-60, MW-61, MW-62, MW-90,

MW-91, MW-93, MW-95, MW-96, MW-98, RW-9 and RW-10. GRO was detected in 17 of the 19 samples.

Samples were collected from 13 wells in the north Refinery area and analyzed for GRO during the second semiannual sampling event. These wells included MW-23, MW-29, MW-41, MW-43, MW-55, MW-60, MW-61, MW-62, MW-90, MW-91, MW-93, MW-96 and MW-98. GRO was detected in 11 of the 13 samples.

The NMED TPH guidance document does not provide a screening value for GRO, but indicates that individual VOCs should be analyzed. The reported concentrations of GRO fluctuate through time in samples from most of the wells in this area. In general, the GRO concentrations show a stable to declining trend over the past three years, with the exception of the concentrations in samples from MW-23, MW-42, MW-60 and MW-67, which appear to be increasing slightly.

*5.3.5.2 DRO*

Samples were collected from 22 wells in the north Refinery area and analyzed for DRO during the first semiannual sampling event. These wells included MW-23, MW-29, MW-40, MW-41, MW-42, MW-43, MW-45, MW-46R, MW-55, MW-56, MW-59, MW-60, MW-61, MW-62, MW-90, MW-91, MW-93, MW-95, MW-96, MW-98, RW-9, and RW-10. DRO concentrations were reported above the CGWSL in 16 of the 22 samples.

Samples were collected from 16 wells in the north Refinery area and analyzed for DRO during the second semiannual sampling event. These wells included MW-23, MW-29, MW-41, MW-43, MW-45, MW-46R, MW-55, MW-56, MW-60, MW-61, MW-62, MW-90, MW-91, MW-93, MW-96, and MW-98. DRO concentrations were reported above the CGWSL in 11 of the 16 samples.

The DRO concentrations in groundwater samples from the north Refinery area show a generally decreasing trend over the past three years.

*5.3.5.3 VOCs*

The same samples collected from wells in the north Refinery area that were analyzed for DRO were also analyzed for VOCs. Various VOCs are present above the CGWSLs, as follows:

- 1,2,4-Trimethylbenzene is present above the CGWSL in the sample collected during the first semiannual event from well MW-42; no sample was collected

from this well during the second semiannual event. 1,2,4-Trimethylbenzene is present above the CGWSL in samples collected during the first and second semiannual events from wells MW-23, MW-43, MW-61, MW-62, MW-91, MW-93, MW-98.

- Benzene is present above the CGWSL in the samples collected during the first semiannual event from wells MW-42, MW-59 and RW-9; no samples were collected from these wells during the second semiannual event. Benzene is present above the CGWSL in samples collected during the first and second semiannual events from wells MW-23, MW-41, MW-43, MW-60, MW-61, MW-62, MW-90, MW-91, MW-93 and MW-98.

- Ethlybenzene is present above the CGWSL in sample collected during the first semiannual event from well MW-23; ethylbenzene was detected in the sample from this well at a concentration less than the CGWSL during the second semiannual event. Ethlybenzene is present above the CGWSL in samples collected during the first and second semiannual events in the samples from wells MW-91 and MW-98.

- MTBE is present above the CGWSL in samples collected during the first and second semiannual events from well MW-96.

- Naphthalene is present above the CGWSL in samples collected during the first and second semiannual events from wells MW-23, MW-61, MW-91, MW-93 and MW-98. Naphthalene was not detected above the CGWSL in the sample collected from well MW-62 during the first semiannual event but was detected above the CGWSL in the sample collected during the second semiannual events.

- Total xylenes is present above the CGWSL in samples collected during the first and second semiannual events from wells MW-91 and MW-98.

The reported concentrations of VOCs have fluctuated over time, but in general do not show an increasing trend in groundwater samples from most of the wells in this area over the past three years, with the exception of the concentrations in samples from wells MW-23, MW-42 and MW-67.

*5.3.5.4 Total Metals*

The same samples collected from wells in the north Refinery area during the first and second semiannual events that were analyzed for DRO were also analyzed for the standard analyte list for total metals identified in Section 5.1 (arsenic, barium, chromium, iron, lead, manganese and selenium). Additionally, wells MW-43, MW-45, MW-55 and MW-60 were sampled for the additional analyte list for total metals identified in Section 5.1 (mercury, nickel and vanadium) during the first and second semiannual events. A field duplicate collected from MW-56 during the first semiannual event was inadvertently analyzed for nickel and vanadium.

No exceedances of the CGWSL were present in any of the samples collected from the wells along in the north Refinery in 2011 for chromium, mercury, nickel, selenium or vanadium. The following total metals are present above the CGWSLs, as follows:

- The arsenic concentration in the sample collected from MW-59 during the first semiannual event exceeded the CGWSL; a sample was not collected from this well during the second semiannual event. Due to matrix interferences, the detection limit exceeded the arsenic CGWSL in several samples.

- The barium concentrations in the samples collected from MW-23 during the first and second semiannual events exceeded the CGWSL. The barium concentration in the sample collected from well MW-43 during the first semiannual event did not exceed the CGSWL but the barium concentration in the sample collected during the second semiannual event did exceed the CGWSL.

- The iron concentrations in the samples collected from RW-10 during the first and second semiannual events exceeded the CGWSL.

- The lead concentration in the sample collected from MW-23 during the first semiannual event exceeded the CGWSL. Lead was not detected above the reporting limit in the sample collected from MW-23 during the second semiannual sampling event but, due to matrix interference, the detection limit for this sample was above the CGWSL. The detection limit exceeded the lead CGWSL in several samples due to matrix interference.

- Manganese concentrations exceeded the CGWSL in the samples collected during the first semiannual event from wells MW-42, MW-59,

RW-9 and RW-10; no samples were collected from these wells during the second semiannual event. Manganese concentrations in the samples collected during the first and second semiannual events from wells MW-29, MW-41, MW-43, MW-45, MW-56 and MW-60 exceeded the CGWSL.

*5.3.5.5 Cyanide*

Samples collected from select wells (MW-43, MW-45, MW-55, and MW-60) were analyzed for cyanide. Cyanide was not detected in the samples collected from these wells.

*5.3.5.6 Water Quality Parameters*

Concentrations of chloride, fluoride, sulfate and TDS exceed the respective CGWSL in various wells in the north Refinery area. The reported concentrations of these constituents exhibit an overall stable or declining trend.

5.3.6 South Refinery Area

Groundwater monitoring in the southern portion of the active Refinery is ongoing. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from the southern portion of the Refinery, as discussed in the following subsections.

As previously noted, wells MW-109 and MW-110 were installed in January 2011 in the south Refinery as part of the AOC Group 3 Corrective Action Investigation. These wells were sampled in January, April and September 2011 and the results of all these events have been included in Table 4 and discussed in the following sections.

*5.3.6.1 GRO*

Samples were collected from MW-109 and MW-110 in January 2011 and analyzed for GRO. Concentrations of GRO in both samples were reported above the detection limit.

Samples were collected from 13 wells in the south Refinery area and analyzed for GRO during the first semiannual sampling event. These wells included MW-28, MW-49, MW-52, MW-57, MW-66, MW-99, MW-101, MW-103, MW-104, MW-106, MW-107, MW-109 and MW-110. GRO was detected in 11 of the 13 samples.

Samples were collected from 12 wells in the south Refinery area and analyze for GRO during the second semiannual sampling event. These wells included MW-28, MW-49, MW-52, MW-57, MW-66, MW-99, MW-101, MW-104, MW-106, MW-107, MW-109 and MW-110. GRO was detected in 11 of the 12 samples.

The NMED TPH guidance document does not provide a screening value for GRO, but indicates that individual VOCs should be analyzed. The reported concentrations of GRO fluctuate through time, but in general show a stable to declining trend over the past three years, with the exception of the concentrations in MW-52 which appear to be increasing.

*5.3.6.2 DRO*

In January 2011, samples were collected from MW-109 and MW-110 and analyzed for DRO. The DRO concentration detected in both samples was above the CGWSL.

Samples were collected from 17 wells in the south Refinery area and analyzed for DRO during the first semiannual sampling event. These wells included KWB-2R, MW-28, MW-49, MW-50, MW-52, MW-57, MW-58, MW-66, MW-99, MW-101, MW-103, MW-104, MW-106, MW-107, MW-109, MW-110 and RW-4. DRO concentrations were reported above the CGWSL in 14 of the 17 samples.

Samples were collected from 14 wells in the south Refinery area and analyzed for DRO during the second semiannual sampling event. These wells included MW-28, MW-49, MW-50, MW-52, MW-57, MW-58, MW-66, MW-99, MW-101, MW-104, MW-106, MW-107, MW-109 and MW-110. DRO concentrations were reported above the CGWSL in eight of the 14 samples.

Although the concentration of DRO in KWB-2R increased between October 2010 and April 2011, DRO concentrations in the south Refinery area show a generally stable or decreasing trend over the past three years.

*5.3.6.3 VOCs*

The same samples collected from wells in the south Refinery area that were analyzed for DRO were also analyzed for VOCs. In addition, samples were collected from two irrigation wells, RA-313 and RA-1227, located near the southeastern portion of the Refinery and analyzed for VOCs during the first semiannual event. Various VOCs are present above the CGWSLs, as follows:

- 1,2,4-Trimethylbenzene is present at a concentration above the CGWSL in the sample collected from KWB-2R during the first semiannual event; no sample was collected during the second semiannual event. 1,2,4-Trimethylbenzene was present above the CGWSL in the samples collected during the first and second semiannual events from wells MW-49, MW-99, MW-106, MW-107, MW-109 and MW-110. Additionally, 1,2,4-trimethylbenzene was detected above the CGWSL in samples collected from MW-109 and MW-110 in January 2011.

- Benzene is present at a concentration above the CGWSL in the samples collected from wells KWB-2R, MW-103 and RW-4 during the first semiannual event; no samples were collected during the second semiannual event. Benzene was present at a concentration above the CGWSL in the samples collected during the first and second semiannual events from wells MW-28, MW-49, MW-58, MW-66, MW-99, MW-101, MW-104, MW-106, MW-107, MW-109 and MW-110. Additionally, benzene was detected above the CGWSL in samples collected from MW-109 and MW-110 in January 2011.

- Ethylbenzene is present at a concentration above the CGWSL in samples collected from MW-109 and MW-110 in January 2011 but ethylbenzene was not detected above the CGWSL in samples from either well during the first or second semiannual events. Ethylbenzene is present at a concentration above the CGWSL in samples collected during the first semiannual event from wells KWB-2R, MW-106 and MW-107. Ethylbenzene was not detected above the CGWSL in samples collected during the second semiannual event from wells MW-106 and MW-107; no sample was collected from well KWB-2R during the second semiannual event.

- MTBE is present at concentrations above the CGWSL in the samples collected from wells MW-107 and RW-4 during the first semiannual event; no samples were collected during the second semiannual event. MTBE is present at a concentration above the CGWSL in samples collected during the first and second semiannual events from wells MW-28, MW-58, MW-66 and MW-99.

- Naphthalene concentrations exceeded the CGWSL in samples collected from MW-109 and MW-110 in January 2011 but was not detected above the CGWSL in MW-109 in the subsequent semiannual events. Naphthalene concentrations exceeded the CGWSL in samples collected during the first semiannual event from wells KWB-2R, MW-107 and MW-110. Naphthalene was not detected above the CGWSL in samples collected during the second

semiannual event from wells MW-107 and MW-110; no sample was collected from well KWB-2R during the second semiannual event. Naphthalene concentration exceeded the CGWSL in samples collected during the first and second semiannual events from wells MW-66 and MW-106.

- Total xylenes concentrations exceeded the CGWSL in the sample collected from KWB-2R during the first semiannual event; no sample was collected during the second semiannual event.

The reported concentrations of VOCs have fluctuated over time, but in general do not show an increasing trend over the past three years with the exception of KWB-2R, RW-4 and concentrations of MTBE in MW-58.

*5.3.6.4 Total Metals*

The same samples collected from wells in the south Refinery area during the first and second semiannual events that were analyzed for DRO were also analyzed for the standard analyte list for total metals identified in Section 5.1 (arsenic, barium, chromium, iron, lead, manganese and selenium). Additionally, wells MW-28, MW-49, MW-52, MW-58 and MW-66 were sampled for the additional analyte list for total metals identified in Section 5.1 (mercury, nickel and vanadium) during the first and second semiannual events.

No reported concentrations exceeded of the CGWSL for chromium, mercury, nickel, selenium or vanadium in any of the samples collected from the south Refinery area. The following total metals are present above the CGWSLs, as follows:

- Arsenic concentrations exceeded the CGWSL in samples collected during the first and second semiannual events from wells MW-58 and MW-109. Arsenic was not detected in samples collected from wells MW-101 and MW-110 during the first semiannual event but exceeded the CGWSL during the second semiannual event. Due to matrix interferences, the detection limit exceeded the arsenic CGWSL in several samples including those collected from MW-101 and MW-110 during the first semiannual event.

- Barium concentrations exceeded the CGWSL in samples collected from MW-66 and MW-107 during the first and second semiannual events.

- The iron concentration in the sample collected from KWB-2R during the first semiannual event exceeded the CGWSL; a sample was not collected from this well during the second semiannual event. Iron concentrations exceeded the CGWSL in samples collected during the first and second semiannual event from wells MW-58, MW-101, MW-107, MW-109 and MW-110. Iron was not detected in the sample collected from well MW-99 during the first semiannual event but exceeded the CGWSL during the second semiannual event.

- The lead concentration in the sample collected from KWB-2R during the first semiannual event exceeded the CGWSL; a sample was not collected from this well during the second semiannual event. Due to matrix interferences, the detection limit exceeded the lead CGWSL in several samples.

- Manganese concentrations exceeded the CGWSL in samples collected during the first semiannual event from wells KWB-2R and MW-57. Manganese was not detected above the CGWSL in the sample collected during the second semiannual event from MW-57; no sample was collected from well KWB-2R during the second semiannual event. Manganese concentrations exceeded the CGWSL in samples collected during the first and second semiannual event from wells MW-28, MW-49, MW-50, MW-58, MW-66, MW-99, MW-101, MW-107, MW-109 and MW-110.

#### *5.3.6.5 Cyanide*

Samples collected from select wells (MW-28, MW-49, MW-52, MW-58 and MW-66) were analyzed for cyanide. Cyanide was not detected in the samples collected from these wells.

#### *5.3.6.6 Water Quality Parameters*

Concentrations of chloride, fluoride, sulfate and TDS exceed the respective CGWSL in various wells in the south Refinery area. The reported concentrations of these constituents exhibit an overall stable or declining trend.

### 5.3.7 Field East of Refinery

Groundwater monitoring in the field east of the Refinery, between the Refinery and the Evaporation Ponds, is ongoing. As shown in Table 4, concentrations of several COCs exceed the CGWSL in samples collected from the field east of the Refinery, as discussed in the following subsections.

#### *5.3.7.1 GRO*

Samples collected during the first and second semiannual events from wells KWB-11A, KWB-11B and KWB-12B were analyzed for GRO. A sample was collected during the second semiannual event and analyzed for GRO from well KWB-12A; a sample was not collected from this well during the first semiannual event. GRO was not detected in any of these samples.

#### *5.3.7.2 DRO*

Samples were collected from seven wells in the field east of the Refinery and analyzed for DRO during the first semiannual sampling event. These wells included KWB-1A, KWB-3AR, KWB-7, KWB-9, KWB-11A, KWB-11B and KWB-12B. DRO was detected at a concentration below the CGWSL in KWB-7 and was not detected above the detection limit in samples collected from the other wells.

Samples were collected from six wells in the field east of the Refinery and analyzed for DRO during the second semiannual sampling event. These wells included KWB-1A, KWB-7, KWB-11A, KWB-11B, KWB-12A and KWB-12B. DRO was not detected in any of the samples.

#### *5.3.7.3 VOCs*

The same samples collected from wells in the field east of the Refinery that were analyzed for DRO were also analyzed for VOCs during both of the semiannual sampling events. In addition, samples were collected from two irrigation wells (RA-4196 and RA-4798) located in the field east of the Refinery during both sampling events and were analyzed for VOCs.

The only VOC concentration reported above the CGWSL was benzene in the sample collected from recovery well KWB-7 during the second semiannual event. Benzene has not been detected in this well during the past three years and the detection during

the second semiannual event may be an anomaly. All other VOCs were either not detected or were detected at concentrations below the CGWSLs.

*5.3.7.4 Total Metals*

The same samples collected from wells in the field east of the Refinery that were analyzed for DRO were also analyzed for the standard and additional analyte lists for total metals identified in Section 5.1 during both of the semiannual sampling events. No reported concentrations exceeded the CGWSLs for arsenic, barium, chromium, iron, lead, mercury, nickel, selenium or vanadium in any of the samples collected from wells in the field east of the Refinery during 2011.

Manganese was detected at concentrations exceeding the CGWSL in samples collected from wells KWB-1A and KWB-7 during the first and second semiannual events. The concentration of manganese in these wells appears to be stable over the past three years.

*5.3.7.5 Cyanide*

Samples collected from select wells (KWB-1A, KWB-3AR, KWB-7, KWB-9, KWB-11A, KWB-11B, KWB-12A and KWB-12B) were analyzed for cyanide. Cyanide was not detected in the samples collected from these wells.

*5.3.7.6 Water Quality Parameters*

Concentrations of chloride, sulfate and TDS exceed the respective CGWSL in various wells in the field east of the Refinery. The reported concentrations of these constituents exhibit an overall stable or declining trend.

5.3.8 Crossgradient and Upgradient Areas

Groundwater monitoring is ongoing in areas both crossgradient to and upgradient from the Refinery. The crossgradient wells include KWB-13 located south of the Refinery, NP-5 located across Eagle Draw to the north of the Refinery and RA-3156 located southeast of the Refinery. Upgradient wells include MW-53, UG-1, UG-2 and UG-3R.

Table 4 shows the analytical results for samples collected from these wells. DRO and manganese were detected at concentrations above the CGWSL in the sample collected from upgradient well MW-53 during the first semiannual event. No sample was collected from this well during the second semiannual event. DRO has not been

detected in samples from MW-53 during the last three years and samples from MW-53 have not been analyzed for manganese in the last three years. These exceedances will be evaluated in future monitoring events.

Sulfate and TDS are present at concentrations exceeding CGWSLs in all of the samples collected from crossgradient and upgradient wells in 2011. Chloride and fluoride are present above the CGWSL in the sample collected from NP-5.

### 5.4 Reverse Osmosis Reject Water

Navajo sends the reject water from the reverse osmosis (RO) system to a nearby agricultural field to be used as irrigation water.

Samples of the RO reject water are collected and analyzed quarterly for metals and water quality parameters. The analytical results for the RO reject water are summarized in Table 5. The full laboratory analytical reports for the RO reject water are provided in Appendix C.

Chloride, fluoride, nitrate/nitrite and sulfate were reported at concentrations above the CGWSLs.

## 6. Remediation System Monitoring

The PCC Permit, the Discharge Permit and the FWGMWP include requirements that PSH present in the shallow groundwater within and adjacent to the Refinery be recovered, where present. A system of recovery trenches and recovery wells has been installed in the Refinery and is used to recover PSH. During 2011, a preliminary design for upgrading the recovery system was developed, which included new pumps, separate water and PSH piping from each trench, and routing of PSH to a product recovery tank instead of through the API separator. The conceptual design was submitted to NMED and OCD in January 2011 (ARCADIS, 2011a). Final design of the upgraded system was completed in 2011 and construction of the upgrades began in December 2011. Construction of the upgrades is expected to be completed during the first quarter of 2012 and the system will begin operation during the first half of 2012.

During 2011, recovery of PSH was accomplished by a dedicated technician, who monitored the trenches and recovery wells approximately every week to document if PSH was present. Pumps in RW-1, RW-2, RW-4, RW-5, RW-6, RW-7, RW-8, RW-15, KWB-8 and the "Chase well" are operated manually when PSH is detected. Dedicated pumps are not present in RW-9 or RW-10. When PSH is present in these locations, it is removed via a portable electric pump or via a hand bailer. Dedicated pumps were present in RW-12, RW-13, and RW-14; however, these pumps were not operable during 2011 due to mechanical failure. A summary of the recovered water and PSH from the recovery trench system is presented in Table 6 and the operation records are contained in Appendix F.

PSH removed from RW-4, RW-5 and RW-6 is placed into dedicated tanks located adjacent to each of these recovery trenches, then transported via truck to the refinery's crude oil tanks. Total fluids removed from the Chase well are placed in a frac tank located near the dewatering sump. Total fluids were removed from the frac tank via vacuum truck and transported either to the Refinery for disposal in the wastewater treatment system upstream of the oil/water separator. One load (35 barrels) of total fluids removed from the frac tank was disposed of at the Lovington Station 567 Salt Water Disposal site in July 2011. Total fluids removed from the remaining recovery trenches and any monitoring wells containing PSH are transported to the Refinery and disposed of in the wastewater treatment system upstream of the oil/water separator. The portion of PSH within the total fluids is estimated.

In addition to the recovery wells, a number of monitor wells that have historically exhibited PSH are gauged by a dedicated technician approximately monthly. PSH is periodically bailed or pumped out of these wells. Table 6 provides a summary of the approximate volume of PSH that was removed from each well and the records are included in Appendix F.

During 2011, an estimated 1,084,118 gallons of groundwater and an estimated 118,798 gallons of PSH were recovered through operation of the recovery system and bailing specific wells. The majority of the PSH recovered came from RW-2, RW-5 and RW-8.

Once the upgrades to the recovery system have been completed, the accuracy of the volume of groundwater and PSH recovered from the recovery trenches will be improved. Select monitoring wells will continue to be bailed or pumped by hand; however the bulk of recovery will be captured by the automated recovery system.

## 7. Conclusions

The following conclusions are based upon the information obtained in 2011 and comparison to data from prior years:

- Groundwater flow direction and gradient remains consistent with that measured in past years.

- The PSH plumes appear to have changed somewhat between 2010 and 2011, as follows:

    - The thickness of PSH southeast of the NCL has decreased somewhat since the end of 2010, but the plume has extended toward the north and south.

    - The extent of PSH in the TEL area has decreased.

    - The thickness of PSH in the north Refinery area (MW-97) has fluctuated but the extent of the PSH remained consistent.

    - The thickness of the PSH plume in the south Refinery area appears fairly consistent, with a slight shift to the south of US-82 at KWB-2R. The thicknesses of PSH in this area have fluctuated and appear to fluctuate between seasons.

    - The thickness and extent of the PSH plume east of the Refinery, near Bolton Road showed an increase between 2010 and 2011. The thicknesses of PSH in this plume decreased between the first and second semiannual events of 2011.

    - The thickness and extent of PSH at the western end of the Evaporation Ponds remained consistent between the second semiannual event of 2010 and both events of 2011.

- Groundwater concentrations of organic constituents have generally remained stable or have declined, with the exception of the benzene concentration east of Bolton Road. The presence of benzene concentrations in this area will be confirmed or denied during the 2012 monitoring events.

- The recovery trench system was manually operated during portions of 2011, but not all equipment was operable and therefore the recovery system was not as effective as in previous years.

Navajo is currently designing and implementing an upgrade of the recovery trench system, including installation of separate product and produced groundwater piping, standardized pumps and improved gauges. A copy of the conceptual design for the upgraded system was submitted to NMED and OCD in January 2011. The detailed design of the upgrades was completed in 2011. Construction of the upgrades to the recovery system began in December 2011 and will be completed in March 2012. The upgraded system will be operated throughout the balance of 2012 and Navajo expects to see improved recovery from the upgraded system.

As per the requirements of the updated PCC Permit, an updated FWGMWP will be submitted in June 2012.

## 8. References

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OCD, 2008. *Discharge Permit (GW-029), Navajo Refining Company – Artesia Refinery*. August 2008.

## Appendices (all on compact disc)

Appendix A Replacement Well Completion Logs

Appendix B Field Sampling Notes

Appendix C Laboratory Reports and Tabulated Data 2009-2011

*Tables:*

*C.1 Groundwater Analytical Data 2009-2011: Total Petroleum Hydrocarbons*

*C.2 Groundwater Analytical Data 2009-2011: Total Metals*

*C.3 Groundwater Analytical Data 2009-2011: Dissolved Metals*

*C.4 Groundwater Analytical Data 2009-2011: Volatile Organic Compounds*

*C.5 Groundwater Analytical Data 2009-2011: Semivolatile Organic Compounds*

*C.6 Groundwater Analytical Data 2009-2011: Water Quality Parameters*

*2011 Analytical Data Reports*

Appendix D Plots of COC Concentrations and Groundwater Elevations Versus Time

Appendix E Data Validation Reports

Appendix F Recovery System Records

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | KWB-1A | 672969.12 | 526181.36 | 3353.46 | 18 to 32 | 3/23/2011 | -- | 13.88 | 3339.58 | -- |
| Shallow | KWB-1A | 672969.12 | 526181.36 | 3353.46 | 18 to 32 | 9/6/2011 | -- | 16.69 | 3336.77 | -- |
| Shallow | KWB-1B | 672968.90 | 526191.02 | 3352.83 | 18 to 32 | 3/23/2011 | -- | 15.58 | 3337.25 | -- |
| Shallow | KWB-1B | 672968.90 | 526191.02 | 3352.83 | 18 to 32 | 9/6/2011 | -- | 18.38 | 3334.45 | -- |
| Valley Fill | KWB-1C | 672968.22 | 526202.95 | 3351.38 | 30.5 to 49.5 | 3/23/2011 | -- | 16.17 | 3335.21 | -- |
| Valley Fill | KWB-1C | 672968.22 | 526202.95 | 3351.38 | 30.5 to 49.5 | 9/6/2011 | -- | 19.00 | 3332.38 | -- |
| Shallow | KWB-2R | 670207.24 | 524897.59 | 3364.32 | unknown | 3/23/2011 | 23.50 | 23.52 | 3340.82 | 0.02 |
| Shallow | KWB-2R | 670207.24 | 524897.59 | 3364.32 | unknown | 9/6/2011 | 20.92 | 21.08 | 3343.37 | 0.16 |
| Shallow | KWB-3AR | 669972.87 | 528901.80 | 3347.08 | unknown | 3/23/2011 | -- | 24.12 | 3322.96 | -- |
| Shallow | KWB-3AR | 669972.87 | 528901.80 | 3347.08 | unknown | 9/7/2011 | -- | 15.03 | 3332.05 | -- |
| Shallow | KWB-4 | 670616.38 | 524572.44 | 3370.25 | 20 to 39 | 3/24/2011 | 25.47 | 27.90 | 3344.29 | 2.43 |
| Shallow | KWB-4 | 670616.38 | 524572.44 | 3370.25 | 20 to 39 | 9/7/2011 | 24.07 | 24.10 | 3346.17 | 0.03 |
| Shallow | KWB-5 | 670729.55 | 525244.51 | 3364.72 | 24.7 to 38.7 | 3/24/2011 | 24.52 | 24.56 | 3340.19 | 0.04 |
| Shallow | KWB-5 | 670729.55 | 525244.51 | 3364.72 | 24.7 to 38.7 | 9/7/2011 | 23.24 | 23.28 | 3341.47 | 0.04 |
| Shallow | KWB-6 | 670449.36 | 526158.70 | 3360.30 | 17.5 to 36.5 | 3/24/2011 | 22.82 | 24.98 | 3337.05 | 2.16 |
| Shallow | KWB-6 | 670449.36 | 526158.70 | 3360.30 | 17.5 to 36.5 | 9/7/2011 | 20.45 | 20.79 | 3339.78 | 0.34 |
| Shallow | KWB-7 | 671266.72 | 529055.47 | 3346.16 | 18 to 32 | 3/23/2011 | -- | 24.50 | 3321.66 | -- |
| Shallow | KWB-7 | 671266.72 | 529055.47 | 3346.16 | 18 to 32 | 9/7/2011 | -- | 19.12 | 3327.04 | -- |
| Shallow | KWB-8 | 671000.57 | 527874.87 | 3350.41 | unknown | 3/23/2011 | 25.46 | 29.05 | 3324.23 | 3.59 |
| Shallow | KWB-8 | 671000.57 | 527874.87 | 3350.41 | unknown | 9/7/2011 | 18.40 | 19.27 | 3331.84 | 0.87 |
| Shallow | KWB-9 | 669628.19 | 527592.61 | 3354.53 | 20 to 34 | 3/23/2011 | -- | 28.46 | 3326.07 | -- |
| Shallow | KWB-9 | 669628.19 | 527592.61 | 3354.53 | 20 to 34 | 9/7/2011 | -- | 21.30 | 3333.23 | -- |
| Shallow | KWB-10R | 671756.34 | 526206.06 | 3350.97 | unknown | 3/23/2011 | 17.15 | 17.58 | 3333.73 | 0.43 |
| Shallow | KWB-10R | 671756.34 | 526206.06 | 3350.97 | unknown | 9/26/2011 (c) | 17.02 | 17.36 | 3333.88 | 0.34 |
| Shallow | KWB-11A | 670643.67 | 529043.46 | 3348.72 | 30 to 39.5 | 3/23/2011 | -- | 26.25 | 3322.47 | -- |
| Shallow | KWB-11A | 670643.67 | 529043.46 | 3348.72 | 30 to 39.5 | 9/7/2011 | -- | 18.12 | 3330.60 | -- |
| Valley Fill | KWB-11B | 670653.84 | 529044.06 | 3348.03 | 50 to 69.5 | 3/23/2011 | -- | 29.96 | 3318.07 | -- |
| Valley Fill | KWB-11B | 670653.84 | 529044.06 | 3348.03 | 50 to 69.5 | 9/7/2011 | -- | 19.82 | 3328.21 | -- |
| Shallow | KWB-12A | 669074.44 | 527590.88 | 3351.81 | 15.5 to 24.5 | 3/23/2011 | -- | Dry | -- | -- |
| Shallow | KWB-12A | 669074.44 | 527590.88 | 3351.81 | 15.5 to 24.5 | 9/7/2011 | -- | 18.23 | 3333.58 | -- |
| Valley Fill | KWB-12B | 669064.18 | 527590.12 | 3351.63 | 25.5 to 39.5 | 3/23/2011 | -- | 26.60 | 3325.03 | -- |
| Valley Fill | KWB-12B | 669064.18 | 527590.12 | 3351.63 | 25.5 to 39.5 | 9/7/2011 | -- | 18.08 | 3333.55 | -- |
| Shallow | KWB-13 | 669077.00 | 524892.42 | 3365.67 | unknown | 3/24/2011 | -- | 26.97 | 3338.70 | -- |
| Shallow | KWB-13 | 669077.00 | 524892.42 | 3365.67 | unknown | 9/7/2011 | -- | 23.23 | 3342.44 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | KWB-P2 | 671184.46 | 530219.31 | 3338.97 | unknown | 3/23/2011 | -- | 29.80 | 3309.17 | -- |
| Shallow | KWB-P2 | 671184.46 | 530219.31 | 3338.97 | unknown | 9/7/2011 | -- | 30.79 | 3308.18 | -- |
| Shallow | KWB-P3 | 669704.98 | 538134.01 | 3308.50 | unknown | 3/23/2011 | -- | 8.75 | 3299.75 | -- |
| Shallow | KWB-P4 | 670970.10 | 537416.92 | 3305.39 | unknown | 3/23/2011 | -- | 5.89 | 3299.50 | -- |
| Shallow | KWB-P4 | 670970.10 | 537416.92 | 3305.39 | unknown | 9/9/2011 | -- | 6.93 | 3298.46 | -- |
| Shallow | MW-1R | 675135.17 | 538636.78 | 3313.28 | unknown | 3/22/2011 | -- | 8.53 | 3304.75 | -- |
| Shallow | MW-1R | 675135.17 | 538636.78 | 3313.28 | unknown | 9/9/2011 | -- | 11.89 | 3301.39 | -- |
| Shallow | MW-2A | 675979.09 | 540803.91 | 3312.97 | unknown | 3/22/2011 | -- | 7.98 | 3304.99 | -- |
| Shallow | MW-2A | 675979.09 | 540803.91 | 3312.97 | unknown | 9/9/2011 | -- | 11.37 | 3301.60 | -- |
| Valley Fill | MW-2B | 675969.73 | 540801.44 | 3312.49 | unknown | 3/22/2011 | -- | 9.48 | 3303.01 | -- |
| Valley Fill | MW-2B | 675969.73 | 540801.44 | 3312.49 | unknown | 9/9/2011 | -- | 12.25 | 3300.24 | -- |
| Shallow | MW-3 | 674443.34 | 540503.24 | 3310.32 | unknown | 3/22/2011 | -- | 8.07 | 3302.25 | -- |
| Shallow | MW-3 | 674443.34 | 540503.24 | 3310.32 | unknown | 9/8/2011 | -- | 10.61 | 3299.71 | -- |
| Shallow | MW-4A | 674083.00 | 540529.44 | 3312.71 | unknown | 3/22/2011 | -- | 10.74 | 3301.97 | -- |
| Shallow | MW-4A | 674083.00 | 540529.44 | 3312.71 | unknown | 9/8/2011 | -- | 13.20 | 3299.51 | -- |
| Valley Fill | MW-4B | 674089.71 | 540541.34 | 3312.01 | unknown | 3/22/2011 | -- | 9.97 | 3302.04 | -- |
| Valley Fill | MW-4B | 674089.71 | 540541.34 | 3312.01 | unknown | 9/8/2011 | -- | 12.58 | 3299.43 | -- |
| Shallow | MW-5A | 674272.84 | 541759.78 | 3308.62 | unknown | 3/22/2011 | -- | 7.97 | 3300.65 | -- |
| Shallow | MW-5A | 674272.84 | 541759.78 | 3308.62 | unknown | 9/8/2011 | -- | 9.73 | 3298.89 | -- |
| Valley Fill | MW-5B | 674272.33 | 541739.12 | 3308.95 | 41.5 to 50.5 | 3/22/2011 | -- | 7.54 | 3301.41 | -- |
| Valley Fill | MW-5B | 674272.33 | 541739.12 | 3308.95 | 41.5 to 50.5 | 9/8/2011 | -- | 9.93 | 3299.02 | -- |
| Valley Fill | MW-5C | 674279.57 | 541728.80 | 3309.28 | 59.25 to 68.75 | 3/22/2011 | -- | 7.67 | 3301.61 | -- |
| Valley Fill | MW-5C | 674279.57 | 541728.80 | 3309.28 | 59.25 to 68.75 | 9/8/2011 | -- | 10.12 | 3299.16 | -- |
| Shallow | MW-6A | 674427.07 | 539833.47 | 3313.46 | unknown | 3/22/2011 | -- | 11.20 | 3302.26 | -- |
| Shallow | MW-6A | 674427.07 | 539833.47 | 3313.46 | unknown | 9/8/2011 | -- | 13.28 | 3300.18 | -- |
| Valley Fill | MW-6B | 674418.57 | 539834.04 | 3313.35 | unknown | 3/22/2011 | -- | 10.91 | 3302.44 | -- |
| Valley Fill | MW-6B | 674418.57 | 539834.04 | 3313.35 | unknown | 9/8/2011 | -- | 13.69 | 3299.66 | -- |
| Shallow | MW-7A | 674447.64 | 542716.01 | 3309.24 | unknown | 3/22/2011 | -- | 6.63 | 3302.61 | -- |
| Shallow | MW-7A | 674447.64 | 542716.01 | 3309.24 | unknown | 9/8/2011 | -- | 9.93 | 3299.31 | -- |
| Valley Fill | MW-7B | 674455.63 | 542715.61 | 3307.87 | unknown | 3/22/2011 | -- | 7.92 | 3299.95 | -- |
| Valley Fill | MW-7B | 674455.63 | 542715.61 | 3307.87 | unknown | 9/8/2011 | -- | 10.28 | 3297.59 | -- |
| Shallow | MW-8 | 673215.93 | 529055.18 | 3336.42 | unknown | 3/23/2011 | -- | 12.51 | 3323.91 | -- |
| Shallow | MW-8 | 673215.93 | 529055.18 | 3336.42 | unknown | 9/8/2011 | -- | 13.66 | 3322.76 | -- |
| Shallow | MW-9 | 673169.56 | 529232.03 | 3336.20 | unknown | 3/23/2011 | -- | 13.18 | 3323.02 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | MW-9 | 673169.56 | 529232.03 | 3336.20 | unknown | 9/7/2011 | -- | 14.72 | 3321.48 | -- |
| Shallow | MW-10 | 672121.15 | 541540.05 | 3304.76 | unknown | 3/22/2011 | -- | 4.80 | 3299.96 | -- |
| Shallow | MW-10 | 672121.15 | 541540.05 | 3304.76 | unknown | 9/8/2011 | -- | 7.07 | 3297.69 | -- |
| Shallow | MW-11A | 677317.73 | 543675.36 | 3310.76 | unknown | 3/22/2011 | -- | 7.78 | 3302.98 | -- |
| Shallow | MW-11A | 677317.73 | 543675.36 | 3310.76 | unknown | 9/8/2011 | -- | 10.53 | 3300.23 | -- |
| Valley Fill | MW-11B | 677305.72 | 543685.50 | 3310.76 | unknown | 3/22/2011 | -- | 7.60 | 3303.16 | -- |
| Valley Fill | MW-11B | 677305.72 | 543685.50 | 3310.76 | unknown | 9/8/2011 | -- | 10.51 | 3300.25 | -- |
| Shallow | MW-12 | 676952.63 | 541505.50 | 3312.73 | unknown | 3/23/2011 | -- | 6.26 | 3306.47 | -- |
| Shallow | MW-12 | 676952.63 | 541505.50 | 3312.73 | unknown | 9/8/2011 | -- | 10.31 | 3302.42 | -- |
| Shallow | MW-13 | 674951.80 | 539762.62 | 3314.24 | unknown | 3/23/2011 | -- | 9.87 | 3304.37 | -- |
| Shallow | MW-13 | 674951.80 | 539762.62 | 3314.24 | unknown | 9/8/2011 | -- | 13.45 | 3300.79 | -- |
| Shallow | MW-14 | 676122.48 | 543280.49 | 3311.84 | unknown | 3/23/2011 | -- | 7.11 | 3304.73 | -- |
| Shallow | MW-14 | 676122.48 | 543280.49 | 3311.84 | unknown | 9/8/2011 | -- | Dry | -- | -- |
| Shallow | MW-15 | 674731.39 | 539003.75 | 3313.72 | unknown | 3/22/2011 | -- | 9.44 | 3304.28 | -- |
| Shallow | MW-15 | 674731.39 | 539003.75 | 3313.72 | unknown | 9/9/2011 | -- | 13.21 | 3300.51 | -- |
| Shallow | MW-16 | 675613.35 | 534389.17 | 3316.12 | unknown | 3/23/2011 | -- | 8.94 | 3307.18 | -- |
| Shallow | MW-16 | 675613.35 | 534389.17 | 3316.12 | unknown | 9/7/2011 | -- | 10.69 | 3305.43 | -- |
| Shallow | MW-17 | 678064.09 | 535480.70 | 3322.01 | unknown | 3/23/2011 | -- | 19.31 | 3302.70 | -- |
| Shallow | MW-18 | 674172.45 | 522318.86 | 3365.42 | 15 to 19 | 3/25/2011 | -- | 12.22 | 3353.20 | -- |
| Shallow | MW-18 | 674172.45 | 522318.86 | 3365.42 | 15 to 19 | 9/6/2011 | -- | 14.73 | 3350.69 | -- |
| Shallow | MW-18A | 672548.16 | 543447.78 | 3308.58 | unknown | 3/22/2011 | -- | 8.12 | 3300.46 | -- |
| Shallow | MW-18A | 672548.16 | 543447.78 | 3308.58 | unknown | 9/8/2011 | -- | 11.40 | 3297.18 | -- |
| Valley Fill | MW-18B | 672557.96 | 543458.22 | 3308.74 | unknown | 3/22/2011 | -- | 7.75 | 3300.99 | -- |
| Valley Fill | MW-18B | 672557.96 | 543458.22 | 3308.74 | unknown | 9/8/2011 | -- | 11.42 | 3297.32 | -- |
| Valley Fill | MW-18T | 672559.79 | 543449.75 | 3308.55 | unknown | 3/22/2011 | -- | 8.08 | 3300.47 | -- |
| Valley Fill | MW-18T | 672559.79 | 543449.75 | 3308.55 | unknown | 9/8/2011 | -- | 11.70 | 3296.85 | -- |
| Shallow | MW-19 | 673597.29 | 521670.75 | 3368.00 | unknown | 3/24/2011 | -- | 14.80 | 3353.20 | -- |
| Shallow | MW-19 | 673597.29 | 521670.75 | 3368.00 | unknown | 9/6/2011 | -- | 15.64 | 3352.36 | -- |
| Shallow | MW-20 | 673800.56 | 527834.67 | 3340.91 | 9.5 to 23.5 | 3/23/2011 | -- | 11.59 | 3329.32 | -- |
| Shallow | MW-20 | 673800.56 | 527834.67 | 3340.91 | 9.5 to 23.5 | 9/7/2011 | -- | 15.27 | 3325.64 | -- |
| Shallow | MW-21 | 673180.38 | 529150.62 | 3337.31 | 7.5 to 22 | 3/23/2011 | -- | 13.98 | 3323.33 | -- |
| Shallow | MW-21 | 673180.38 | 529150.62 | 3337.31 | 7.5 to 22 | 9/7/2011 | -- | 15.06 | 3322.25 | -- |
| Shallow | MW-22A | 672866.82 | 541801.63 | 3307.62 | unknown | 3/22/2011 | -- | 7.18 | 3300.44 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | MW-22A | 672866.82 | 541801.63 | 3307.62 | unknown | 9/8/2011 | -- | 9.43 | 3298.19 | -- |
| Valley Fill | MW-22B | 672866.58 | 541786.97 | 3307.63 | unknown | 3/22/2011 | -- | 6.93 | 3300.70 | -- |
| Valley Fill | MW-22B | 672866.58 | 541786.97 | 3307.63 | unknown | 9/8/2011 | -- | 9.31 | 3298.32 | -- |
| Shallow | MW-23 | 672851.25 | 522821.05 | 3368.38 | 15 to 20 | 3/25/2011 | -- | 14.60 | 3353.78 | -- |
| Shallow | MW-23 | 672851.25 | 522821.05 | 3368.38 | 15 to 20 | 9/6/2011 | -- | 16.32 | 3352.06 | -- |
| Shallow | MW-24 | 676498.23 | 544101.56 | 3312.85 | 15 to 20 | 3/23/2011 | -- | 8.44 | 3304.41 | -- |
| Shallow | MW-24 | 676498.23 | 544101.56 | 3312.85 | 15 to 20 | 9/8/2011 | -- | 13.67 | 3299.18 | -- |
| Shallow | MW-25 | 675386.30 | 537955.86 | 3312.29 | 15.75 to 25.25 | 3/22/2011 | -- | 13.25 | 3299.04 | -- |
| Shallow | MW-25 | 675386.30 | 537955.86 | 3312.29 | 15.75 to 25.25 | 9/9/2011 | -- | 14.98 | 3297.31 | -- |
| Shallow | MW-26 | 676229.18 | 535348.61 | 3314.87 | 15.75 to 25.25 | 3/23/2011 | -- | 8.03 | 3306.84 | -- |
| Shallow | MW-26 | 676229.18 | 535348.61 | 3314.87 | 15.75 to 25.25 | 9/7/2011 | -- | 12.91 | 3301.96 | -- |
| Shallow | MW-27 | 674495.64 | 532942.65 | 3320.85 | 18.25 to 27.75 | 3/23/2011 | -- | 15.30 | 3305.55 | -- |
| Shallow | MW-27 | 674495.64 | 532942.65 | 3320.85 | 18.25 to 27.75 | 9/7/2011 | -- | 15.10 | 3305.75 | -- |
| Shallow | MW-28 | 671508.38 | 524521.56 | 3370.27 | 25 to 30 | 3/24/2011 | -- | 23.87 | 3346.40 | -- |
| Shallow | MW-28 | 671508.38 | 524521.56 | 3370.27 | 25 to 30 | 9/6/2011 | -- | 24.23 | 3346.04 | -- |
| Shallow | MW-29 | 673481.15 | 523544.65 | 3360.64 | 9.75 to 19.25 | 3/24/2011 | -- | 11.21 | 3349.43 | -- |
| Shallow | MW-29 | 673481.15 | 523544.65 | 3360.64 | 9.75 to 19.25 | 9/6/2011 | -- | 13.82 | 3346.82 | -- |
| Shallow | MW-30 | 674125.92 | 523548.75 | 3354.33 | unknown | 3/24/2011 | -- | 8.36 | 3345.97 | -- |
| Shallow | MW-30 | 674125.92 | 523548.75 | 3354.33 | unknown | 9/6/2011 | -- | 10.23 | 3344.10 | -- |
| Shallow | MW-39 | 673039.50 | 523422.93 | 3358.79 | 14 to 24 | 3/24/2011 | 9.25 | 9.30 | 3349.53 | 0.05 |
| Shallow | MW-39 | 673039.50 | 523422.93 | 3358.79 | 14 to 24 | 9/7/2011 | 11.75 | 11.78 | 3347.03 | 0.03 |
| Shallow | MW-40 | 673161.12 | 523489.02 | 3356.93 | unknown | 3/24/2011 | -- | 7.39 | 3349.54 | -- |
| Shallow | MW-40 | 673161.12 | 523489.02 | 3356.93 | unknown | 9/6/2011 | -- | 9.97 | 3346.96 | -- |
| Shallow | MW-41 | 673379.87 | 523374.64 | 3356.58 | 14 to 19 | 3/24/2011 | -- | 8.45 | 3348.13 | -- |
| Shallow | MW-41 | 673379.87 | 523374.64 | 3356.58 | 14 to 19 | 9/6/2011 | -- | 10.67 | 3345.91 | -- |
| Shallow | MW-42 | 673480.27 | 523263.53 | 3358.59 | unknown | 3/24/2011 | -- | 8.43 | 3350.16 | -- |
| Shallow | MW-42 | 673480.27 | 523263.53 | 3358.59 | unknown | 9/6/2011 | Well damaged - could not be gauged or sampled | | | |
| Shallow | MW-43 | 673115.86 | 522950.40 | 3365.49 | 15.5 to 20.5 | 3/25/2011 | -- | 12.08 | 3353.41 | -- |
| Shallow | MW-43 | 673115.86 | 522950.40 | 3365.49 | 15.5 to 20.5 | 9/6/2011 | -- | 13.70 | 3351.79 | -- |
| Shallow | MW-45 | 674247.07 | 523663.75 | 3351.51 | 10.5 to 15.5 | 3/24/2011 | -- | 5.42 | 3346.09 | -- |
| Shallow | MW-45 | 674247.07 | 523663.75 | 3351.51 | 10.5 to 15.5 | 9/6/2011 | -- | 7.25 | 3344.26 | -- |
| Shallow | MW-46R | 674223.03 | 524920.28 | 3350.11 | unknown | 3/24/2011 | -- | 4.38 | 3345.73 | -- |
| Shallow | MW-46R | 674223.03 | 524920.28 | 3350.11 | unknown | 9/6/2011 | -- | 5.68 | 3344.43 | -- |
| Shallow | MW-48 | 670689.39 | 524080.35 | 3362.97 | unknown | 3/24/2011 | 20.32 | 20.57 | 3342.60 | 0.25 |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | MW-48 | 670689.39 | 524080.35 | 3362.97 | unknown | 9/7/2011 | 19.45 | 19.55 | 3343.50 | 0.10 |
| Shallow | MW-49 | 672051.80 | 523610.79 | 3359.77 | unknown | 3/24/2011 | -- | 12.47 | 3347.30 | -- |
| Shallow | MW-49 | 672051.80 | 523610.79 | 3359.77 | unknown | 9/6/2011 | -- | 13.34 | 3346.43 | -- |
| Shallow | MW-50 | 671502.45 | 521857.84 | 3371.05 | unknown | 3/25/2011 | -- | 19.04 | 3352.01 | -- |
| Shallow | MW-50 | 671502.45 | 521857.84 | 3371.05 | unknown | 9/7/2011 | -- | 19.21 | 3351.84 | -- |
| Shallow | MW-52 | 670165.24 | 523370.99 | 3368.30 | unknown | 3/24/2011 | -- | 21.53 | 3346.77 | -- |
| Shallow | MW-52 | 670165.24 | 523370.99 | 3368.30 | unknown | 9/6/2011 | -- | 20.36 | 3347.94 | -- |
| Shallow | MW-53 | 673626.07 | 521459.12 | 3368.73 | unknown | 3/24/2011 | -- | 15.40 | 3353.33 | -- |
| Shallow | MW-53 | 673626.07 | 521459.12 | 3368.73 | unknown | 9/6/2011 | -- | 16.14 | 3352.59 | -- |
| Shallow | MW-54A | 674138.65 | 522110.51 | 3366.49 | unknown | 3/24/2011 | -- | 14.32 | 3352.17 | -- |
| Shallow | MW-54A | 674138.65 | 522110.51 | 3366.49 | unknown | 9/6/2011 | -- | 15.54 | 3350.95 | -- |
| Valley Fill | MW-54B | 674148.44 | 522118.80 | 3366.47 | unknown | 3/24/2011 | -- | 14.33 | 3352.14 | -- |
| Valley Fill | MW-54B | 674148.44 | 522118.80 | 3366.47 | unknown | 9/6/2011 | -- | 15.65 | 3350.82 | -- |
| Shallow | MW-55 | 674091.95 | 522766.46 | 3364.77 | unknown | 3/24/2011 | -- | 12.91 | 3351.86 | -- |
| Shallow | MW-55 | 674091.95 | 522766.46 | 3364.77 | unknown | 9/6/2011 | -- | 14.33 | 3350.44 | -- |
| Shallow | MW-56 | 674160.38 | 523450.14 | 3357.44 | unknown | 3/24/2011 | -- | 11.61 | 3345.83 | -- |
| Shallow | MW-56 | 674160.38 | 523450.14 | 3357.44 | unknown | 9/6/2011 | -- | 13.37 | 3344.07 | -- |
| Shallow | MW-57 | 669935.59 | 527579.02 | 3350.91 | unknown | 3/23/2011 | -- | 23.98 | 3326.93 | -- |
| Shallow | MW-57 | 669935.59 | 527579.02 | 3350.91 | unknown | 9/7/2011 | -- | 15.50 | 3335.41 | -- |
| Shallow | MW-58 | 670207.27 | 525197.99 | 3362.22 | unknown | 3/24/2011 | -- | 22.39 | 3339.83 | -- |
| Shallow | MW-58 | 670207.27 | 525197.99 | 3362.22 | unknown | 9/6/2011 | -- | 19.71 | 3342.51 | -- |
| Shallow | MW-59 | 672815.74 | 523854.62 | 3354.78 | unknown | 3/24/2011 | -- | 6.38 | 3348.40 | -- |
| Shallow | MW-59 | 672815.74 | 523854.62 | 3354.78 | unknown | 9/6/2011 | -- | 9.06 | 3345.72 | -- |
| Shallow | MW-60 | 672850.69 | 524144.40 | 3354.33 | unknown | 3/25/2011 | -- | 7.53 | 3346.80 | -- |
| Shallow | MW-60 | 672850.69 | 524144.40 | 3354.33 | unknown | 9/6/2011 | -- | 10.32 | 3344.01 | -- |
| Shallow | MW-61 | 672441.15 | 522574.92 | 3369.47 | 14 to 29 | 3/25/2011 | -- | 14.45 | 3355.02 | -- |
| Shallow | MW-61 | 672441.15 | 522574.92 | 3369.47 | 14 to 29 | 9/7/2011 | -- | 16.08 | 3353.39 | -- |
| Shallow | MW-62 | 672648.15 | 522702.48 | 3371.29 | 14 to 29 | 3/25/2011 | -- | 17.53 | 3353.76 | -- |
| Shallow | MW-62 | 672648.15 | 522702.48 | 3371.29 | 14 to 29 | 9/6/2011 | -- | 19.13 | 3352.16 | -- |
| Shallow | MW-64 | 670716.03 | 523338.61 | 3369.52 | 15 to 30 | 3/24/2011 | 21.42 | 22.84 | 3347.82 | 1.42 |
| Shallow | MW-64 | 670716.03 | 523338.61 | 3369.52 | 15 to 30 | 9/7/2011 | 21.25 | 22.58 | 3348.00 | 1.33 |
| Shallow | MW-65 | 670949.22 | 523711.75 | 3363.60 | 14.5 to 29.5 | 3/24/2011 | 17.63 | 20.95 | 3345.31 | 3.32 |
| Shallow | MW-65 | 670949.22 | 523711.75 | 3363.60 | 14.5 to 29.5 | 9/7/2011 | 17.56 | 19.43 | 3345.67 | 1.87 |
| Shallow | MW-66 | 671247.57 | 524560.06 | 3363.46 | 14.6 to 29.6 | 3/24/2011 | -- | 18.13 | 3345.33 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | MW-66 | 671247.57 | 524560.06 | 3363.46 | 14.6 to 29.6 | 9/6/2011 | -- | 17.97 | 3345.49 | -- |
| Shallow | MW-67 | 673224.88 | 522342.43 | 3365.45 | 12 to 27 | NR | 11.89 | 12.90 | 3353.36 | 1.01 |
| Shallow | MW-67 | 673224.88 | 522342.43 | 3365.45 | 12 to 27 | 9/7/2011 | 12.93 | 16.20 | 3351.87 | 3.27 |
| Shallow | MW-68 | 674301.02 | 531466.90 | 3328.21 | unknown | 3/23/2011 | -- | 22.61 | 3305.60 | -- |
| Shallow | MW-68 | 674301.02 | 531466.90 | 3328.21 | unknown | 9/7/2011 | -- | 23.65 | 3304.56 | -- |
| Shallow | MW-69 | 675962.29 | 540401.29 | 3313.86 | unknown | 3/23/2011 | -- | 7.30 | 3306.56 | -- |
| Shallow | MW-69 | 675962.29 | 540401.29 | 3313.86 | unknown | 9/8/2011 | -- | Dry | -- | -- |
| Shallow | MW-70 | 670892.66 | 542787.60 | 3306.30 | unknown | 3/22/2011 | -- | 7.05 | 3299.25 | -- |
| Shallow | MW-70 | 670892.66 | 542787.60 | 3306.30 | unknown | 9/8/2011 | -- | 9.65 | 3296.65 | -- |
| Shallow | MW-71 | 673016.80 | 529560.41 | 3335.29 | unknown | 3/23/2011 | -- | 15.97 | 3319.32 | -- |
| Shallow | MW-71 | 673016.80 | 529560.41 | 3335.29 | unknown | 9/7/2011 | -- | 16.59 | 3318.70 | -- |
| Shallow | MW-72 | 676691.27 | 542662.31 | 3308.45 | 2 to 12 | 3/22/2011 | -- | 6.28 | 3302.17 | -- |
| Shallow | MW-72 | 676691.27 | 542662.31 | 3308.45 | 2 to 12 | 9/9/2011 | -- | 8.23 | 3300.22 | -- |
| Shallow | MW-73 | 675910.20 | 542130.56 | 3310.18 | 2 to 17 | 3/22/2011 | -- | 9.58 | 3300.60 | -- |
| Shallow | MW-73 | 675910.20 | 542130.56 | 3310.18 | 2 to 17 | 9/8/2011 | -- | 9.84 | 3300.34 | -- |
| Shallow | MW-74 | 675059.14 | 541546.30 | 3310.03 | 2 to 17 | 3/22/2011 | -- | 8.21 | 3301.82 | -- |
| Shallow | MW-74 | 675059.14 | 541546.30 | 3310.03 | 2 to 17 | 9/8/2011 | -- | 10.26 | 3299.77 | -- |
| Shallow | MW-75 | 674622.31 | 541132.78 | 3310.21 | 3 to 18 | 3/22/2011 | -- | 8.21 | 3302.00 | -- |
| Shallow | MW-75 | 674622.31 | 541132.78 | 3310.21 | 3 to 18 | 9/8/2011 | -- | 10.66 | 3299.55 | -- |
| Shallow | MW-76 | 674482.47 | 541053.83 | 3311.84 | 3 to 18 | 3/22/2011 | -- | 9.79 | 3302.05 | -- |
| Shallow | MW-76 | 674482.47 | 541053.83 | 3311.84 | 3 to 18 | 9/8/2011 | -- | 12.24 | 3299.60 | -- |
| Shallow | MW-77 | 674529.89 | 541104.86 | 3310.07 | 3 to 18 | 3/22/2011 | -- | 8.05 | 3302.02 | -- |
| Shallow | MW-77 | 674529.89 | 541104.86 | 3310.07 | 3 to 18 | 9/8/2011 | -- | 10.51 | 3299.56 | -- |
| Shallow | MW-78 | 674529.23 | 541073.45 | 3310.14 | 2 to 17 | 3/22/2011 | -- | 8.09 | 3302.05 | -- |
| Shallow | MW-78 | 674529.23 | 541073.45 | 3310.14 | 2 to 17 | 9/8/2011 | -- | 10.55 | 3299.59 | -- |
| Shallow | MW-79 | 675349.67 | 540906.08 | 3311.43 | 2 to 17 | 3/22/2011 | -- | 8.84 | 3302.59 | -- |
| Shallow | MW-79 | 675349.67 | 540906.08 | 3311.43 | 2 to 17 | 9/8/2011 | -- | 11.03 | 3300.40 | -- |
| Shallow | MW-80 | 675371.74 | 540646.46 | 3310.79 | 2 to 17 | 3/22/2011 | -- | 7.31 | 3303.48 | -- |
| Shallow | MW-80 | 675371.74 | 540646.46 | 3310.79 | 2 to 17 | 9/8/2011 | -- | 10.21 | 3300.58 | -- |
| Shallow | MW-81 | 675252.80 | 540544.47 | 3312.34 | 2 to 17 | 3/22/2011 | -- | 8.93 | 3303.41 | -- |
| Shallow | MW-81 | 675252.80 | 540544.47 | 3312.34 | 2 to 17 | 9/8/2011 | -- | 11.94 | 3300.40 | -- |
| Shallow | MW-82 | 675035.42 | 540806.88 | 3310.75 | 2 to 17 | 3/22/2011 | -- | 8.12 | 3302.63 | -- |
| Shallow | MW-82 | 675035.42 | 540806.88 | 3310.75 | 2 to 17 | 9/8/2011 | -- | 10.78 | 3299.97 | -- |
| Shallow | MW-83 | 674524.97 | 540832.80 | 3310.19 | 2 to 17 | 3/22/2011 | -- | 7.99 | 3302.20 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | MW-83 | 674524.97 | 540832.80 | 3310.19 | 2 to 17 | 9/9/2011 | -- | 10.51 | 3299.68 | -- |
| Shallow | MW-84 | 674798.43 | 540109.13 | 3311.59 | 2 to 17 | 3/22/2011 | -- | 9.56 | 3302.03 | -- |
| Shallow | MW-84 | 674798.43 | 540109.13 | 3311.59 | 2 to 17 | 9/8/2011 | -- | 10.23 | 3301.36 | -- |
| Shallow | MW-85 | 674566.12 | 539805.49 | 3311.09 | 3 to 18 | 3/22/2011 | 7.88 | 9.28 | 3302.93 | 1.40 |
| Shallow | MW-85 | 674566.12 | 539805.49 | 3311.09 | 3 to 18 | 9/9/2011 | 11.24 | 12.67 | 3299.56 | 1.43 |
| Shallow | MW-86 | 674645.96 | 539671.17 | 3311.06 | 2 to 17 | 3/22/2011 | 7.35 | 8.83 | 3303.41 | 1.48 |
| Shallow | MW-86 | 674645.96 | 539671.17 | 3311.06 | 2 to 17 | 9/8/2011 | 10.91 | 11.91 | 3299.95 | 1.00 |
| Shallow | MW-87 | 673379.98 | 543280.45 | 3307.64 | 2 to 17 | 3/22/2011 | -- | 7.43 | 3300.21 | -- |
| Shallow | MW-87 | 673379.98 | 543280.45 | 3307.64 | 2 to 17 | 9/8/2011 | -- | 9.83 | 3297.81 | -- |
| Shallow | MW-88 | 672899.14 | 540832.09 | 3308.68 | 3 to 18 | 3/22/2011 | -- | 8.12 | 3300.56 | -- |
| Shallow | MW-88 | 672899.14 | 540832.09 | 3308.68 | 3 to 18 | 9/8/2011 | -- | 10.22 | 3298.46 | -- |
| Shallow | MW-89 | 675211.56 | 533835.00 | 3318.32 | 2 to 17 | 3/23/2011 | -- | 10.95 | 3307.37 | -- |
| Shallow | MW-89 | 675211.56 | 533835.00 | 3318.32 | 2 to 17 | 9/7/2011 | -- | 12.22 | 3306.10 | -- |
| Shallow | MW-90 | 672909.28 | 521960.18 | 3369.42 | 5 to 20 | 3/25/2011 | -- | 14.91 | 3354.51 | -- |
| Shallow | MW-90 | 672909.28 | 521960.18 | 3369.42 | 5 to 20 | 9/6/2011 | -- | 16.11 | 3353.31 | -- |
| Shallow | MW-91 | 672945.86 | 522146.43 | 3367.73 | 7 to 22 | 3/25/2011 | -- | 13.73 | 3354.00 | -- |
| Shallow | MW-91 | 672945.86 | 522146.43 | 3367.73 | 7 to 22 | 9/6/2011 | -- | 14.94 | 3352.79 | -- |
| Shallow | MW-92 | 672766.10 | 522167.26 | 3368.72 | 5 to 20 | 3/25/2011 | 14.67 | 14.72 | 3354.04 | 0.05 |
| Shallow | MW-92 | 672766.10 | 522167.26 | 3368.72 | 5 to 20 | 9/7/2011 | 15.66 | 16.52 | 3352.89 | 0.86 |
| Shallow | MW-93 | 672897.25 | 522446.83 | 3363.79 | 5 to 20 | 3/25/2011 | -- | 10.18 | 3353.61 | -- |
| Shallow | MW-93 | 672897.25 | 522446.83 | 3363.79 | 5 to 20 | 9/6/2011 | -- | 11.44 | 3352.35 | -- |
| Shallow | MW-94 | 673510.54 | 522336.27 | 3367.97 | 5 to 20 | 3/24/2011 | 13.67 | 20.17 | 3353.00 | 6.50 |
| Shallow | MW-94 | 673510.54 | 522336.27 | 3367.97 | 5 to 20 | 9/7/2011 | 14.72 | 22.55 | 3351.68 | 7.83 |
| Shallow | MW-95 | 673084.72 | 522308.89 | 3368.70 | 7 to 22 | 3/25/2011 | -- | 15.11 | 3353.59 | -- |
| Shallow | MW-95 | 673084.72 | 522308.89 | 3368.70 | 7 to 22 | 9/6/2011 | -- | 16.39 | 3352.31 | -- |
| Shallow | MW-96 | 673143.60 | 521917.50 | 3368.92 | 7 to 22 | 3/25/2011 | -- | 14.93 | 3353.99 | -- |
| Shallow | MW-96 | 673143.60 | 521917.50 | 3368.92 | 7 to 22 | 9/6/2011 | -- | 15.95 | 3352.97 | -- |
| Shallow | MW-97 | 672660.45 | 522295.96 | 3365.92 | 8 to 23 | NR | 11.67 | 18.08 | 3352.97 | 6.41 |
| Shallow | MW-97 | 672660.45 | 522295.96 | 3365.92 | 8 to 23 | 9/7/2011 | 13.97 | 17.54 | 3351.24 | 3.57 |
| Shallow | MW-98 | 672517.05 | 523220.39 | 3361.36 | 13 to 23 | 3/25/2011 | -- | 11.18 | 3350.18 | -- |
| Shallow | MW-98 | 672517.05 | 523220.39 | 3361.36 | 13 to 23 | 9/6/2011 | -- | 12.93 | 3348.43 | -- |
| Shallow | MW-99 | 671652.52 | 524579.74 | 3364.07 | 12 to 27 | 3/24/2011 | -- | 18.98 | 3345.09 | -- |
| Shallow | MW-99 | 671652.52 | 524579.74 | 3364.07 | 12 to 27 | 9/6/2011 | -- | 18.37 | 3345.70 | -- |
| Shallow | MW-101 | 671628.25 | 523506.58 | 3364.23 | 8 to 23 | 3/24/2011 | -- | 17.03 | 3347.20 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | MW-101 | 671628.25 | 523506.58 | 3364.23 | 8 to 23 | 9/6/2011 | -- | 17.42 | 3346.81 | -- |
| Shallow | MW-102 | 671176.70 | 522937.01 | 3367.64 | 12 to 27 | 3/24/2011 | 17.83 | 20.30 | 3349.32 | 2.47 |
| Shallow | MW-102 | 671176.70 | 522937.01 | 3367.64 | 12 to 27 | 9/7/2011 | 17.93 | 20.50 | 3349.20 | 2.57 |
| Shallow | MW-103 | 670472.55 | 522607.80 | 3372.47 | 7 to 22 | 3/24/2011 | -- | 20.03 | 3352.44 | -- |
| Shallow | MW-103 | 670472.55 | 522607.80 | 3372.47 | 7 to 22 | 9/6/2011 | -- | 19.53 | 3352.94 | -- |
| Shallow | MW-104 | 670450.35 | 522729.44 | 3371.43 | 3 to 18 | 3/24/2011 | -- | 14.60 | 3356.83 | -- |
| Shallow | MW-104 | 670450.35 | 522729.44 | 3371.43 | 3 to 18 | 9/6/2011 | -- | 13.75 | 3357.68 | -- |
| Shallow | MW-105 | 671924.44 | 522454.93 | 3364.99 | 8 to 18 | 3/24/2011 | 13.42 | 13.84 | 3351.49 | 0.42 |
| Shallow | MW-105 | 671924.44 | 522454.93 | 3364.99 | 8 to 18 | 9/7/2011 | 14.13 | 14.74 | 3350.74 | 0.61 |
| Shallow | MW-106 | 672207.14 | 523454.55 | 3358.98 | 0 to 11 | 3/24/2011 | -- | 9.93 | 3349.05 | -- |
| Shallow | MW-106 | 672207.14 | 523454.55 | 3358.98 | 0 to 11 | 9/6/2011 | -- | 11.07 | 3347.91 | -- |
| Shallow | MW-107 | 671961.38 | 524600.45 | 3359.44 | 12 to 22 | 3/24/2011 | -- | 13.53 | 3345.91 | -- |
| Shallow | MW-107 | 671961.38 | 524600.45 | 3359.44 | 12 to 22 | 9/6/2011 | -- | 14.78 | 3344.66 | -- |
| Shallow | MW-108 | 673659.33 | 521910.16 | 3369.11 | 9 to 24 | 3/24/2011 | -- | 16.19 | 3352.92 | -- |
| Shallow | MW-108 | 673659.33 | 521910.16 | 3369.11 | 9 to 24 | 9/6/2011 | -- | 17.16 | 3351.95 | -- |
| Shallow | MW-109 | 670174.25 | 523065.52 | 3368.09 | 15 to 29.5 | 3/24/2011 | -- | 19.85 | 3348.24 | -- |
| Shallow | MW-109 | 670174.25 | 523065.52 | 3368.09 | 15 to 29.5 | 9/7/2011 | -- | 18.83 | 3349.26 | -- |
| Shallow | MW-110 | 670174.33 | 522796.69 | 3368.03 | 15 to 29.5 | 3/24/2011 | -- | 17.44 | 3350.59 | -- |
| Shallow | MW-110 | 670174.33 | 522796.69 | 3368.03 | 15 to 29.5 | 9/6/2011 | -- | 16.54 | 3351.49 | -- |
| Shallow | NCL-31 | 673629.51 | 521669.01 | 3367.54 | 13 to 18 | 3/24/2011 | -- | 14.38 | 3353.16 | -- |
| Shallow | NCL-31 | 673629.51 | 521669.01 | 3367.54 | 13 to 18 | 9/6/2011 | -- | 15.24 | 3352.30 | -- |
| Shallow | NCL-32 | 673984.83 | 521808.14 | 3364.91 | 17 to 22 | 3/24/2011 | -- | 13.07 | 3351.84 | -- |
| Shallow | NCL-32 | 673984.83 | 521808.14 | 3364.91 | 17 to 22 | 9/6/2011 | -- | 14.60 | 3350.31 | -- |
| Shallow | NCL-33 | 673967.20 | 522245.18 | 3363.97 | 13 to 18 | 3/24/2011 | -- | 12.64 | 3351.33 | -- |
| Shallow | NCL-33 | 673967.20 | 522245.18 | 3363.97 | 13 to 18 | 9/6/2011 | -- | 13.81 | 3350.16 | -- |
| Shallow | NCL-34A | 673885.52 | 522235.08 | 3365.49 | unknown | 3/24/2011 | 12.64 | 18.00 | 3351.78 | 5.36 |
| Shallow | NCL-34A | 673885.52 | 522235.08 | 3365.49 | unknown | 9/7/2011 | 13.38 | 19.25 | 3350.94 | 5.87 |
| Shallow | NCL-44 | 673986.41 | 522062.11 | 3364.45 | unknown | 3/24/2011 | -- | 12.08 | 3352.37 | -- |
| Shallow | NCL-44 | 673986.41 | 522062.11 | 3364.45 | unknown | 9/6/2011 | -- | 13.16 | 3351.29 | -- |
| Shallow | NCL-49 | 674099.16 | 521648.40 | 3371.13 | unknown | 3/24/2011 | -- | 18.80 | 3352.33 | -- |
| Shallow | NCL-49 | 674099.16 | 521648.40 | 3371.13 | unknown | 9/7/2011 | -- | 20.00 | 3351.13 | -- |
| Shallow | NP-1 | 672992.73 | 528035.04 | 3342.40 | unknown | 3/23/2011 | -- | 15.47 | 3326.93 | -- |
| Shallow | NP-1 | 672992.73 | 528035.04 | 3342.40 | unknown | 9/7/2011 | -- | 17.42 | 3324.98 | -- |
| Shallow | NP-2 | 673571.19 | 527611.64 | 3342.77 | 9.5 to 18.5 | 3/23/2011 | -- | 12.94 | 3329.83 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | NP-2 | 673571.19 | 527611.64 | 3342.77 | 9.5 to 18.5 | 9/7/2011 | -- | 16.17 | 3326.60 | -- |
| Shallow | NP-3 | 673990.66 | 528019.54 | 3342.93 | 9.5 to 18.5 | 3/23/2011 | -- | 14.05 | 3328.88 | -- |
| Shallow | NP-3 | 673990.66 | 528019.54 | 3342.93 | 9.5 to 18.5 | 9/7/2011 | -- | 17.92 | 3325.01 | -- |
| Shallow | NP-4 | 674337.35 | 528351.85 | 3345.73 | 24.5 to 33.5 | 3/23/2011 | -- | 23.13 | 3322.60 | -- |
| Shallow | NP-4 | 674337.35 | 528351.85 | 3345.73 | 24.5 to 33.5 | 9/8/2011 | -- | 28.74 | 3316.99 | -- |
| Shallow | NP-5 | 675512.24 | 524698.19 | 3349.29 | unknown | 3/23/2011 | -- | 13.83 | 3335.46 | -- |
| Shallow | NP-5 | 675512.24 | 524698.19 | 3349.29 | unknown | 9/6/2011 | -- | 14.83 | 3334.46 | -- |
| Shallow | NP-6 | 672945.23 | 529083.91 | 3338.05 | unknown | 3/23/2011 | -- | 13.85 | 3324.20 | -- |
| Shallow | NP-6 | 672945.23 | 529083.91 | 3338.05 | unknown | 9/7/2011 | -- | 13.37 | 3324.68 | -- |
| Shallow | NP-8 | 675399.60 | 538245.49 | 3314.67 | unknown | 3/22/2011 | -- | 10.76 | 3303.91 | -- |
| Shallow | NP-8 | 675399.60 | 538245.49 | 3314.67 | unknown | 9/9/2011 | -- | 13.80 | 3300.87 | -- |
| Shallow | NP-9 | 674767.14 | 523571.69 | 3360.62 | unknown | 3/24/2011 | -- | 12.08 | 3348.54 | -- |
| Shallow | NP-9 | 674767.14 | 523571.69 | 3360.62 | unknown | 9/6/2011 | -- | 13.41 | 3347.21 | -- |
| Shallow | OCD-1R | 676741.31 | 541568.00 | 3314.27 | unknown | 3/22/2011 | -- | 9.72 | 3304.55 | -- |
| Shallow | OCD-1R | 676741.31 | 541568.00 | 3314.27 | unknown | 9/8/2011 | -- | 12.82 | 3301.45 | -- |
| Shallow | OCD-2A | 677036.12 | 542157.14 | 3314.16 | unknown | 3/22/2011 | -- | 9.10 | 3305.06 | -- |
| Shallow | OCD-2A | 677036.12 | 542157.14 | 3314.16 | unknown | 9/8/2011 | -- | 13.94 | 3300.22 | -- |
| Valley Fill | OCD-2B | 677034.65 | 542167.57 | 3313.07 | unknown | 3/22/2011 | -- | 10.06 | 3303.01 | -- |
| Valley Fill | OCD-2B | 677034.65 | 542167.57 | 3313.07 | unknown | 9/8/2011 | -- | 12.73 | 3300.34 | -- |
| Shallow | OCD-3 | 677516.31 | 543024.47 | 3314.43 | unknown | 3/22/2011 | -- | 9.79 | 3304.64 | -- |
| Shallow | OCD-3 | 677516.31 | 543024.47 | 3314.43 | unknown | 9/8/2011 | -- | 13.65 | 3300.78 | -- |
| Shallow | OCD-4 | 678099.52 | 543893.55 | 3313.68 | unknown | 3/22/2011 | -- | 9.17 | 3304.51 | -- |
| Shallow | OCD-4 | 678099.52 | 543893.55 | 3313.68 | unknown | 9/8/2011 | -- | 13.08 | 3300.60 | -- |
| Shallow | OCD-5 | 677081.54 | 544295.35 | 3311.27 | unknown | 3/22/2011 | -- | 7.86 | 3303.41 | -- |
| Shallow | OCD-5 | 677081.54 | 544295.35 | 3311.27 | unknown | 9/8/2011 | -- | 11.18 | 3300.09 | -- |
| Shallow | OCD-6 | 676538.82 | 543540.03 | 3311.40 | unknown | 3/22/2011 | -- | 7.20 | 3304.20 | -- |
| Shallow | OCD-6 | 676538.82 | 543540.03 | 3311.40 | unknown | 9/9/2011 | -- | 11.71 | 3299.69 | -- |
| Shallow | OCD-7AR | 676169.74 | 543071.88 | 3310.03 | 5.5 to 19.5 | 3/23/2011 | -- | 6.18 | 3303.85 | -- |
| Shallow | OCD-7AR | 676169.74 | 543071.88 | 3310.03 | 5.5 to 19.5 | 9/9/2011 | -- | 10.55 | 3299.48 | -- |
| Valley Fill | OCD-7B | 676157.36 | 543081.99 | 3310.26 | 43.5 to 52.5 | 3/23/2011 | -- | 7.55 | 3302.71 | -- |
| Valley Fill | OCD-7B | 676157.36 | 543081.99 | 3310.26 | 43.5 to 52.5 | 9/9/2011 | -- | 10.63 | 3299.63 | -- |
| Valley Fill | OCD-7C | 676155.95 | 543069.21 | 3310.10 | 60.25 to 69.75 | 3/23/2011 | -- | 7.63 | 3302.47 | -- |
| Valley Fill | OCD-7C | 676155.95 | 543069.21 | 3310.10 | 60.25 to 69.75 | 9/9/2011 | -- | 10.37 | 3299.73 | -- |
| Shallow | OCD-8A | 674976.41 | 543376.95 | 3308.72 | unknown | 3/22/2011 | -- | 9.56 | 3299.16 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | OCD-8A | 674976.41 | 543376.95 | 3308.72 | unknown | 9/8/2011 | -- | 11.25 | 3297.47 | -- |
| Valley Fill | OCD-8B | 674992.24 | 543375.06 | 3309.19 | unknown | 3/22/2011 | -- | 7.49 | 3301.70 | -- |
| Valley Fill | OCD-8B | 674992.24 | 543375.06 | 3309.19 | unknown | 9/8/2011 | -- | 10.18 | 3299.01 | -- |
| Shallow | RW-1 | 672825.27 | 522204.68 | 3367.03 | -- | 3/24/2011 | 12.93 | 12.98 | 3354.09 | 0.05 |
| Shallow | RW-1 | 672825.27 | 522204.68 | 3367.03 | -- | 9/7/2011 | 17.90 | 17.95 | 3349.12 | 0.05 |
| Shallow | RW-2 | 672781.86 | 522337.29 | 3368.43 | -- | 3/24/2011 | 14.70 | 15.00 | 3353.67 | 0.30 |
| Shallow | RW-2 | 672781.86 | 522337.29 | 3368.43 | -- | 9/7/2011 | 15.82 | 16.83 | 3352.41 | 1.01 |
| Shallow | RW-4 | 671378.27 | 523010.47 | 3364.86 | -- | 3/24/2011 | 17.79 | 17.80 | 3347.07 | 0.01 |
| Shallow | RW-4 | 671378.27 | 523010.47 | 3364.86 | -- | 9/7/2011 | 17.94 | 18.03 | 3346.90 | 0.09 |
| Shallow | RW-5 | 671271.08 | 523652.31 | 3363.81 | -- | 3/24/2011 | 16.57 | 17.80 | 3346.99 | 1.23 |
| Shallow | RW-5 | 671271.08 | 523652.31 | 3363.81 | -- | 9/7/2011 | 16.68 | 17.43 | 3346.98 | 0.75 |
| Shallow | RW-6 | 670969.39 | 522843.22 | 3368.36 | -- | 3/24/2011 | -- | Dry | -- | -- |
| Shallow | RW-6 | 670969.39 | 522843.22 | 3368.36 | -- | 9/7/2011 | -- | Dry | -- | -- |
| Shallow | RW-7 | 673579.35 | 522098.94 | 3367.09 | -- | 3/24/2011 | 13.63 | 16.03 | 3352.98 | 2.40 |
| Shallow | RW-7 | 673579.35 | 522098.94 | 3367.09 | -- | 9/7/2011 | 17.07 | 18.00 | 3349.83 | 0.93 |
| Shallow | RW-8 | 673266.20 | 522321.21 | 3368.10 | -- | 3/24/2011 | 14.07 | 17.30 | 3353.38 | 3.23 |
| Shallow | RW-8 | 673266.20 | 522321.21 | 3368.10 | -- | 9/7/2011 | 17.00 | 17.65 | 3350.97 | 0.65 |
| Shallow | RW-9 | 673423.49 | 523371.16 | 3359.51 | -- | 3/24/2011 | -- | 10.40 | 3349.11 | -- |
| Shallow | RW-9 | 673423.49 | 523371.16 | 3359.51 | -- | 9/6/2011 | -- | 12.59 | 3346.92 | -- |
| Shallow | RW-10 | 673076.17 | 523469.29 | 3360.61 | -- | 3/24/2011 | -- | 11.03 | 3349.58 | -- |
| Shallow | RW-10 | 673076.17 | 523469.29 | 3360.61 | -- | 9/6/2011 | -- | 13.58 | 3347.03 | -- |
| Shallow | RW-11-4 | 670056.32 | 527577.74 | 3350.98 | -- | 3/23/2011 | -- | Dry | -- | -- |
| Shallow | RW-11-4 | 669938.15 | 527541.66 | 3353.95 | -- | 9/7/2011 | -- | 19.49 | 3334.46 | -- |
| Shallow | RW-12 | 670533.38 | 527533.00 | 3352.55 | -- | 3/23/2011 | -- | Dry | -- | -- |
| Shallow | RW-12 | 670533.38 | 527533.00 | 3352.55 | -- | 9/7/2011 | -- | 19.63 | 3332.92 | -- |
| Shallow | RW-13 | 671041.58 | 527528.79 | 3351.95 | -- | 3/23/2011 | 23.56 | 24.83 | 3328.14 | 1.27 |
| Shallow | RW-13 | 671041.58 | 527528.79 | 3351.95 | -- | 9/7/2011 | 19.28 | 19.31 | 3332.66 | 0.03 |
| Shallow | RW-14 | 671603.65 | 527519.99 | 3351.48 | -- | 3/23/2011 | 21.22 | 23.06 | 3329.89 | 1.84 |
| Shallow | RW-14 | 671603.65 | 527519.99 | 3351.48 | -- | 9/7/2011 | 19.82 | 19.88 | 3331.65 | 0.06 |
| Shallow | RW-15E | 670709.29 | 524119.27 | 3362.30 | -- | 3/24/2011 | 18.06 | 19.15 | 3344.02 | 1.09 |
| Shallow | RW-15E | 670820.45 | 524123.41 | 3361.41 | -- | 9/7/2011 | 17.66 | 18.10 | 3343.66 | 0.44 |
| Shallow | RW-16E | 673727.22 | 523302.16 | 3360.01 | -- | 3/24/2011 | -- | 12.58 | 3347.43 | -- |
| Shallow | RW-16E | 673876.71 | 523156.09 | 3360.97 | -- | 9/6/2011 | -- | 14.56 | 3346.41 | -- |
| Shallow | RW-17E | 673802.93 | 522630.29 | 3366.15 | -- | 3/24/2011 | -- | 12.58 | 3353.57 | -- |

# Table 1 - Well Information and Gauging Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| Water-Bearing Zone (a) | Well ID | Northing | Easting | TOC Elevation (ft amsl) | Screen Interval (ft bgs) | Date Measured | Depth to PSH (ft btoc) | Depth to Water (ft btoc) | Water Elevation (b) (ft amsl) | PSH Thickness (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| Shallow | RW-17E | 673978.33 | 522723.59 | 3364.72 | -- | 9/6/2011 | -- | 14.00 | 3350.72 | -- |
| Shallow | RW-18E | 673501.25 | 526185.14 | 3352.05 | -- | 3/23/2011 | -- | 11.92 | 3340.13 | -- |
| Shallow | RW-18E | 673750.19 | 526188.64 | 3350.84 | -- | 9/6/2011 | -- | 15.76 | 3335.08 | -- |
| Shallow | TEL-1 | 672966.33 | 523412.82 | 3358.23 | 13 to 23 | 3/25/2011 | -- | 8.73 | 3349.50 | -- |
| Shallow | TEL-1 | 672966.33 | 523412.82 | 3358.23 | 13 to 23 | 9/7/2011 | -- | 11.12 | 3347.11 | -- |
| Shallow | TEL-2 | 672885.90 | 523419.29 | 3359.12 | 13 to 23 | 3/25/2011 | -- | 9.63 | 3349.49 | -- |
| Shallow | TEL-2 | 672885.90 | 523419.29 | 3359.12 | 13 to 23 | 9/7/2011 | -- | 11.96 | 3347.16 | -- |
| Shallow | TEL-3 | 672796.06 | 523459.33 | 3358.33 | 13 to 23 | 3/25/2011 | -- | 8.89 | 3349.44 | -- |
| Shallow | TEL-3 | 672796.06 | 523459.33 | 3358.33 | 13 to 23 | 9/7/2011 | -- | 11.06 | 3347.27 | -- |
| Shallow | TEL-4 | 672715.99 | 523181.18 | 3360.24 | 13 to 23 | 3/25/2011 | -- | 10.40 | 3349.84 | -- |
| Shallow | TEL-4 | 672715.99 | 523181.18 | 3360.24 | 13 to 23 | 9/7/2011 | -- | 12.31 | 3347.93 | -- |
| Shallow | UG-1 | 672453.27 | 520746.73 | 3372.94 | 8 to 23 | 3/24/2011 | -- | 17.65 | 3355.29 | -- |
| Shallow | UG-1 | 672453.27 | 520746.73 | 3372.94 | 8 to 23 | 9/6/2011 | -- | 19.41 | 3353.53 | -- |
| Shallow | UG-2 | 670726.77 | 520942.36 | 3380.41 | 15 to 30 | 3/24/2011 | -- | 22.17 | 3358.24 | -- |
| Shallow | UG-2 | 670726.77 | 520942.36 | 3380.41 | 15 to 30 | 9/6/2011 | -- | 21.90 | 3358.51 | -- |
| Shallow | UG-3R | 671992.70 | 519424.77 | 3384.08 | 17 to 37 | 3/24/2011 | -- | 30.22 | 3353.86 | -- |
| Shallow | UG-3R | 671992.70 | 519424.77 | 3384.08 | 17 to 37 | 9/7/2011 | -- | 30.78 | 3353.30 | -- |

**Definitions:**

amsl = above mean sea level
bgs = below ground surface
btoc = below top of casing
Dry = no water present in casing
ft = feet
NR = date not recorded in field notes
PSH = phase separated hydrocarbons
unknown = screen interval not readily availble

**Footnotes:**

(a) Wells screened in the shallow water-bearing zone are typically screened at depths of 20 to 25 ft bgs. The shallow water-bearing zone varies between confined and unconfined conditions. Wells screened in the valley fill zone are typically screened at depths ranging between 35 and 70 ft bgs. The clay lens separating the shallow and valley fill zones is discontinuous in some locations and thus, in some areas, there is connectivity between the
(b) Water elevations are adjusted for PSH, if present, using an assumed specific gravity of 0.8.
(c) KWB-10R was not gauged during initial gauging effort in September 2011 due to oversight.

# Table 2 - Well Purging and Water Quality Measurement Data

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Well | Date | Time | Purge Method | Temperature (°C) | Conductivity (S/m) | DO (mg/L) | pH (std units) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| KWB-1A | 04/08/2011 | 10:00 | Low Flow | 19.8 | 4.48 | 3.05 | 6.96 | 70 |
| KWB-1A | 09/26/2011 | 11:30 | Low Flow | 19.93 | 3.951 | 0.4 | 6.46 | -260 |
| KWB-1C | 04/08/2011 | 9:25 | Submersible | 17.93 | 4.41 | 8.1 | 7.57 | 4950 |
| KWB-2R | 04/06/2011 | 13:00 | Low Flow | 21.36 | 3.47 | 2.62 | 6.8 | -275 |
| KWB-3AR | 04/08/2011 | 11:00 | Low Flow | 21.99 | 5.45 | 6.6 | 7.12 | 141 |
| KWB-7 | 04/07/2011 | 16:50 | Low Flow | 22.18 | 3.75 | 3.03 | 6.94 | 129 |
| KWB-7 | 09/22/2011 | 14:45 | Low Flow | 20.22 | 3.804 | 0.1 | 6.76 | -400 |
| KWB-9 | 04/06/2011 | 9:10 | Submersible | 18.37 | 3.96 | 2.58 | 6.74 | 133 |
| KWB-11A | 04/11/2011 | 10:20 | Submersible | 17.64 | 4.88 | 5.48 | 6.83 | 248 |
| KWB-11A | 09/22/2011 | 11:08 | Low Flow | 20.35 | 4.592 | 0.63 | 6.53 | -310 |
| KWB-11B | 04/11/2011 | 11:00 | Submersible | 17.73 | 3.2 | 19.28 | 7.52 | 151 |
| KWB-11B | 09/22/2011 | 12:18 | Low Flow | 22.20 | 2.899 | 4.14 | 7.28 | 240 |
| KWB-12A | 09/21/2011 | 9:45 | Low Flow | 22.24 | 3.972 | 3.2 | 6.66 | -220 |
| KWB-12B | 04/06/2011 | 8:30 | Low Flow | 18.67 | 4.25 | 6.18 | 6.88 | 145 |
| KWB-12B | 09/21/2011 | 8:30 | Low Flow | 20.68 | 3.572 | 3.59 | 6.61 | -210 |
| KWB-13 | 04/08/2011 | 12:07 | Submersible | 17.93 | 4.12 | 9.15 | 7.16 | 113 |
| KWB-P4 | 04/05/2011 | 16:40 | Low Flow | 18.22 | 7.29 | 2.03 | 7.09 | -17 |
| MW-1R | 03/31/2011 | 12:45 | Low Flow | 18.58 | 7.91 | 2.36 | 7.41 | -115 |
| MW-2A | 03/31/2011 | 8:25 | Low Flow | 16.25 | 16.9 | 1.81 | 7.28 | -81 |
| MW-2A | 09/19/2011 | 11:45 | Low Flow | 24.61 | 20.47 | 0.21 | 6.88 | -320 |
| MW-3 | 03/31/2011 | 9:55 | Low Flow | 18.11 | 6.29 | 2.47 | 7.24 | -54 |
| MW-3 | 09/19/2011 | 13:50 | Low Flow | 25.08 | 5.872 | 0.3 | 6.91 | -340 |
| MW-4A | 04/05/2011 | 12:35 | Low Flow | 18.69 | 6.77 | 2.22 | 7.39 | -140 |
| MW-4A | 09/19/2011 | 14:46 | Low Flow | 22.14 | 6.743 | 0.33 | 7.02 | -370 |
| MW-4B | 04/05/2011 | 12:00 | Low Flow | 19.58 | 4.7 | 5.86 | 7.9 | 13 |
| MW-5A | 04/05/2011 | 11:00 | Low Flow | 18.04 | 19.9 | 1.92 | 7.22 | -128 |
| MW-5A | 09/19/2011 | 15:28 | Low Flow | 22.86 | 17.65 | 0.11 | 6.96 | -360 |
| MW-5B | 04/05/2011 | 10:30 | Low Flow | 18.65 | 9.28 | 2.48 | 7.54 | -19 |
| MW-5C | 04/05/2011 | 9:55 | Low Flow | 18.36 | 4.34 | 7.36 | 8.24 | -27 |
| MW-6A | 03/31/2011 | 11:20 | Low Flow | 19.39 | 5.52 | 2.29 | 7.68 | -137 |
| MW-6B | 03/31/2011 | 10:40 | Low Flow | 20.35 | 4.46 | 6.94 | 8.01 | 34 |
| MW-7A | 04/04/2011 | 13:20 | Low Flow | 17.94 | 9.31 | 2.03 | 7.5 | -157 |
| MW-7A | 09/20/2011 | 14:40 | Low Flow | 23.53 | 8.961 | 0.23 | 7.17 | -390 |
| MW-7B | 04/04/2011 | 13:50 | Low Flow | 18.90 | 5.5 | 6.75 | 8.01 | -2 |
| MW-8 | 04/07/2011 | 13:50 | Low Flow | 18.89 | 6.1 | 2.93 | 7.24 | 101 |
| MW-8 | 09/22/2011 | 9:02 | Low Flow | 20.52 | 5.591 | 0.11 | 6.98 | -370 |
| MW-10 | 04/05/2011 | 15:45 | Low Flow | 20.12 | 7.3 | 5.6 | 7.29 | -2 |
| MW-10 | 09/20/2011 | 8:35 | Low Flow | 20.86 | 6.666 | 4.6 | 6.95 | -240 |
| MW-11A | 03/31/2011 | 16:00 | Low Flow | 19.91 | 29.7 | 2.33 | 7.08 | -45 |
| MW-11B | 03/31/2011 | 16:40 | Low Flow | 20.21 | 23.5 | 2.48 | 7.86 | -160 |
| MW-15 | 03/31/2011 | 13:20 | Low Flow | 18.28 | 7.15 | 2.35 | 7.16 | -11 |
| MW-16 | 04/07/2011 | 8:25 | Low Flow | 15.58 | 4.72 | 4.25 | 7.44 | 70 |

# Table 2 - Well Purging and Water Quality Measurement Data

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Well | Date | Time | Purge Method | Temperature (°C) | Conductivity (S/m) | DO (mg/L) | pH (std units) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| MW-18 | 04/11/2011 | 15:25 | Low Flow | 18.76 | 3.27 | 4.58 | 6.98 | 18 |
| MW-18 | 09/29/2011 | 8:40 | Low Flow | 22.71 | 2.827 | 0.34 | 6.67 | -350 |
| MW-18A | 04/04/2011 | 14:40 | Low Flow | 18.58 | 25.5 | 2.06 | 7.45 | -265 |
| MW-18A | 09/20/2011 | 16:35 | Low Flow | 22.93 | 22.02 | 0.22 | 7.04 | -360 |
| MW-18B | 04/04/2011 | 15:15 | Low Flow | 19.25 | 5.01 | 3.05 | 7.59 | -122 |
| MW-20 | 04/07/2011 | 12:15 | Low Flow | 19.22 | 5.54 | 3.04 | 7.2 | 64 |
| MW-21 | 04/07/2011 | 14:30 | Low Flow | 19.35 | 6.38 | 3 | 7.13 | 135 |
| MW-21 | 09/22/2011 | 9:40 | Low Flow | 20.17 | 5.6 | 0.07 | 6.87 | -380 |
| MW-22A | 04/05/2011 | 15:00 | Low Flow | 18.79 | 8.73 | 2.19 | 7.24 | -153 |
| MW-22A | 09/20/2011 | 7:45 | Low Flow | 21.12 | 7.86 | 0.27 | 6.99 | -340 |
| MW-22B | 04/05/2011 | 14:30 | Low Flow | 19.70 | 7.39 | 4.57 | 7.63 | 26 |
| MW-23 | 04/14/2011 | 11:20 | Low Flow | 25.86 | 3.46 | 13.02 | 7.18 | -332 |
| MW-23 | 09/23/2011 | 9:40 | Low Flow | 27.61 | 3.558 | 0.01 | 6.82 | -310 |
| MW-25 | 03/31/2011 | 11:55 | Low Flow | 19.34 | 4.57 | 2.13 | 7.43 | 11 |
| MW-26 | 04/07/2011 | 9:20 | Low Flow | 17.43 | 5.43 | 3.3 | 7.31 | 85 |
| MW-27 | 04/07/2011 | 10:45 | Low Flow | 21.60 | 2.95 | 3.39 | 7.2 | 73 |
| MW-28 | 04/13/2011 | 12:00 | Low Flow | 22.96 | 2.96 | 2.93 | 7.39 | -303 |
| MW-28 | 09/23/2011 | 11:05 | Low Flow | 24.88 | 2.932 | 0.02 | 7.1 | -330 |
| MW-29 | 04/12/2011 | 15:20 | Low Flow | 20.14 | 4.79 | 2.92 | 6.84 | -306 |
| MW-29 | 09/27/2011 | 15:17 | Low Flow | 23.42 | 5.177 | 0.26 | 6.66 | -340 |
| MW-40 | 04/12/2011 | 14:20 | Low Flow | 21.55 | 2.76 | 2.8 | 7 | -357 |
| MW-41 | 09/28/2011 | 8:25 | Low Flow | 21.98 | 4.692 | 1.53 | 6.48 | -230 |
| MW-42 | 04/12/2011 | 13:15 | Low Flow | 19.96 | 5.13 | 4 | 6.76 | -352 |
| MW-43 | 04/14/2011 | 12:05 | Low Flow | 20.90 | 3.95 | 11.42 | 6.92 | -357 |
| MW-43 | 09/23/2011 | 10:25 | Low Flow | 23.94 | 3.942 | 0.03 | 6.77 | -340 |
| MW-45 | 04/14/2011 | 14:30 | Low Flow | 20.74 | 4.89 | 9.72 | 7.06 | -98 |
| MW-45 | 09/26/2011 | 12:50 | Low Flow | 24.98 | 4.659 | 0.09 | 6.79 | -390 |
| MW-46R | 04/12/2011 | 16:10 | Low Flow | 19.43 | 4.9 | 2.63 | 6.99 | -82 |
| MW-46R | 09/26/2011 | 13:46 | Low Flow | 23.29 | 4.555 | 0.08 | 6.71 | -390 |
| MW-49 | 04/12/2011 | 17:05 | Low Flow | 22.53 | 3.22 | 3.02 | 6.79 | -368 |
| MW-49 | 09/27/2011 | 11:17 | Low Flow | 24.38 | 2.978 | 0.24 | 6.6 | -340 |
| MW-50 | 04/13/2011 | 7:50 | Low Flow | 20.47 | 3.12 | 2.33 | 7.16 | -314 |
| MW-50 | 09/15/2011 | 14:55 | Low Flow | 23.23 | 2.656 | 0.15 | 6.91 | -440 |
| MW-52 | 04/01/2011 | 8:40 | Low Flow | 19.61 | 3.27 | 2.39 | 6.94 | 154 |
| MW-52 | 09/15/2011 | 10:25 | Low Flow | 20.47 | 2.621 | 0.36 | 6.87 | -350 |
| MW-53 | 04/01/2011 | 11:30 | Low Flow | 21.22 | 3.12 | 2.48 | 7.15 | 43 |
| MW-54A | 04/01/2011 | 12:10 | Low Flow | 27.68 | 2.72 | 2.72 | 6.7 | 42 |
| MW-54A | 09/15/2011 | 13:10 | Low Flow | 22.21 | 2.494 | 0.18 | 6.34 | -360 |
| MW-54B | 04/01/2011 | 13:00 | Low Flow | 20.60 | 2.21 | 5.19 | 7.27 | 75 |
| MW-55 | 04/11/2011 | 16:00 | Low Flow | 19.81 | 5.21 | 4.16 | 7.12 | 26 |
| MW-55 | 09/29/2011 | 9:20 | Low Flow | 21.99 | 4.637 | 0.7 | 6.8 | -330 |
| MW-56 | 04/11/2011 | 17:50 | Low Flow | 19.84 | 4.53 | 2.6 | 6.86 | 49 |
| MW-56 | 09/29/2011 | 11:00 | Low Flow | 24.04 | 4.11 | 0.44 | 6.64 | -390 |
| MW-57 | 04/06/2011 | 9:55 | Low Flow | 21.15 | 5.55 | 2.83 | 6.83 | 36 |

# Table 2 - Well Purging and Water Quality Measurement Data

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Well | Date | Time | Purge Method | Temperature (°C) | Conductivity (S/m) | DO (mg/L) | pH (std units) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| MW-57 | 09/21/2011 | 11:36 | Low Flow | 21.26 | 8.342 | 0.81 | 6.75 | -330 |
| MW-58 | 04/06/2011 | 11:15 | Low Flow | 20.09 | 2.8 | 3.19 | 6.77 | -65 |
| MW-58 | 09/22/2011 | 13:37 | Low Flow | 22.61 | 2.56 | 0.17 | 6.56 | -390 |
| MW-59 | 04/12/2011 | 11:45 | Low Flow | 19.66 | 3.44 | 6.16 | 7.05 | -214 |
| MW-60 | 04/12/2011 | 12:30 | Low Flow | 19.35 | 4.39 | 3.87 | 6.86 | -323 |
| MW-60 | 09/27/2011 | 12:50 | Low Flow | 23.58 | 4.366 | 0.26 | 6.57 | -340 |
| MW-61 | 04/14/2011 | 9:40 | Low Flow | 22.70 | 5.25 | 5.58 | 6.89 | -371 |
| MW-61 | 09/16/2011 | 12:11 | Low Flow | 25.45 | 4.442 | 0.22 | 6.71 | -410 |
| MW-62 | 04/14/2011 | 9:00 | Low Flow | 21.71 | 2.49 | 3.45 | 6.83 | -354 |
| MW-62 | 09/28/2011 | 8:55 | Low Flow | 23.89 | 2.622 | 0.45 | 6.52 | -350 |
| MW-66 | 04/13/2011 | 11:00 | Low Flow | 21.05 | 2.17 | 3.24 | 6.93 | -198 |
| MW-66 | 09/16/2011 | 8:23 | Low Flow | 21.16 | 1.413 | 1.83 | 6.78 | -280 |
| MW-68 | 04/07/2011 | 16:00 | Low Flow | 20.58 | 2.81 | 4.08 | 7.19 | 132 |
| MW-70 | 04/05/2011 | 8:25 | Low Flow | 16.61 | 6.31 | 1.86 | 7.39 | -178 |
| MW-70 | 09/20/2011 | 15:55 | Low Flow | 24.59 | 6.109 | 0.14 | 7.11 | -390 |
| MW-71 | 04/07/2011 | 15:10 | Low Flow | 19.42 | 7.05 | 5.18 | 7.16 | 130 |
| MW-71 | 09/22/2011 | 10:21 | Low Flow | 19.94 | 6.16 | 4.54 | 6.8 | -150 |
| MW-72 | 03/28/2011 | 13:33 | Low Flow | 15.53 | 15.2 | 2.3 | 7.08 | -121 |
| MW-72 | 09/13/2011 | 11:00 | Low Flow | 23.59 | 13.23 | 0.13 | 6.84 | -380 |
| MW-73 | 03/28/2011 | 14:25 | Low Flow | 16.72 | 13.8 | 2.4 | 7.34 | -107 |
| MW-73 | 09/13/2011 | 12:30 | Low Flow | 21.12 | 11.17 | 0.21 | 7.12 | -430 |
| MW-74 | 03/28/2011 | 15:00 | Low Flow | 18.54 | 12.7 | 2.25 | 7.2 | -47 |
| MW-74 | 09/13/2011 | 13:20 | Low Flow | 23.98 | 11.05 | 0.43 | 6.87 | -350 |
| MW-75 | 03/28/2011 | 15:40 | Low Flow | 19.84 | 10 | 2.12 | 7.31 | -97 |
| MW-75 | 09/13/2011 | 14:05 | Low Flow | 23.28 | 8.132 | 0.2 | 7.03 | -400 |
| MW-76 | 03/29/2011 | 10:25 | Low Flow | 18.26 | 7.2 | 1.75 | 7.2 | -102 |
| MW-76 | 09/13/2011 | 15:00 | Low Flow | 23.90 | 6.941 | 0.08 | 6.87 | -430 |
| MW-77 | 03/28/2011 | 16:20 | Low Flow | 19.32 | 9 | 2.36 | 7.09 | -103 |
| MW-77 | 09/14/2011 | 9:52 | Low Flow | 21.98 | 8.568 | 0.02 | 6.87 | 210 |
| MW-78 | 03/29/2011 | 9:37 | Low Flow | 17.28 | 6.67 | 1.7 | 7 | -28 |
| MW-79 | 03/29/2011 | 13:00 | Low Flow | 17.17 | 9.17 | 1.96 | 7.28 | -88 |
| MW-79 | 09/14/2011 | 9:00 | Low Flow | 21.02 | 8.599 | 0.5 | 6.88 | 230 |
| MW-80 | 03/29/2011 | 13:35 | Low Flow | 17.71 | 7.12 | 1.87 | 7.28 | -55 |
| MW-81 | 03/29/2011 | 14:15 | Low Flow | 17.83 | 7.39 | 1.98 | 7.23 | 32 |
| MW-82 | 03/29/2011 | 11:40 | Low Flow | 18.48 | 9.07 | 1.65 | 7.25 | -118 |
| MW-82 | 09/20/2011 | 15:16 | Low Flow | 29.14 | 18.33 | 0.79 | 6.99 | -340 |
| MW-83 | 03/29/2011 | 11:05 | Low Flow | 17.83 | 6.91 | 1.96 | 7.19 | 91 |
| MW-83 | 09/14/2011 | 11:54 | Low Flow | 22.47 | 6.514 | 0.13 | 6.99 | -380 |
| MW-84 | 03/29/2011 | 12:20 | Low Flow | 19.17 | 12 | 1.76 | 7.22 | -3 |
| MW-84 | 09/14/2011 | 11:10 | Low Flow | 22.86 | 9.949 | 0.11 | 6.95 | -330 |
| MW-87 | 04/05/2011 | 9:10 | Low Flow | 16.93 | 19.3 | 2.53 | 7.38 | 5 |
| MW-87 | 09/20/2011 | 15:40 | Low Flow | 29.14 | 18.33 | 0.79 | 6.99 | -340 |
| MW-88 | 04/05/2011 | 13:30 | Low Flow | 18.89 | 8.12 | 2.44 | 7.32 | -77 |
| MW-88 | 09/20/2011 | 9:39 | Low Flow | 21.62 | 7.121 | 0.38 | 7.02 | -370 |

# Table 2 - Well Purging and Water Quality Measurement Data

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Well | Date | Time | Purge Method | Temperature (°C) | Conductivity (S/m) | DO (mg/L) | pH (std units) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| MW-89 | 04/07/2011 | 10:00 | Low Flow | 17.75 | 3.2 | 3.59 | 7.29 | -56 |
| MW-90 | 04/15/2011 | 9:25 | Low Flow | 19.29 | 3.24 | 18.71 | 6.92 | -381 |
| MW-90 | 09/28/2011 | 11:05 | Low Flow | 23.55 | 2.959 | 0.28 | 6.68 | -400 |
| MW-91 | 04/15/2011 | 8:40 | Low Flow | 21.71 | 2.35 | 17.39 | 6.75 | -389 |
| MW-91 | 09/28/2011 | 10:20 | Low Flow | 25.90 | 1.662 | 0.3 | 6.66 | -380 |
| MW-93 | 04/14/2011 | 10:35 | Low Flow | 20.85 | 2.31 | 17.92 | 6.86 | -389 |
| MW-93 | 09/28/2011 | 9:39 | Low Flow | 23.94 | 2.174 | 0.29 | 6.58 | -380 |
| MW-95 | 04/14/2011 | 16:35 | Low Flow | 21.01 | 2.53 | 7.26 | 6.98 | -230 |
| MW-96 | 04/15/2011 | 10:40 | Low Flow | 21.01 | 2.68 | 14.47 | 6.97 | -383 |
| MW-96 | 09/29/2011 | 7:55 | Low Flow | 23.01 | 2.372 | 0.71 | 6.74 | -330 |
| MW-98 | 04/12/2011 | 11:00 | Low Flow | 20.00 | 3.93 | 4.36 | 6.95 | -390 |
| MW-98 | 09/27/2011 | 10:22 | Low Flow | 24.01 | 3.728 | 0.23 | 6.67 | -360 |
| MW-99 | 04/13/2011 | 10:20 | Low Flow | 21.30 | 2.68 | 3.16 | 6.79 | -353 |
| MW-99 | 09/16/2011 | 7:30 | Low Flow | 20.85 | 2.183 | 0.13 | 6.69 | -380 |
| MW-101 | 04/14/2011 | 15:50 | Low Flow | 21.65 | 2.3 | 11.85 | 6.79 | -327 |
| MW-101 | 09/16/2011 | 11:30 | Low Flow | 23.11 | 2.042 | 0.22 | 6.64 | -380 |
| MW-103 | 04/13/2011 | 9:30 | Low Flow | 23.88 | 4.99 | 2.47 | 7.92 | -323 |
| MW-104 | 04/13/2011 | 8:50 | Low Flow | 14.70 | 2.13 | 3.12 | 7.35 | -289 |
| MW-104 | 09/16/2011 | 10:19 | Low Flow | 20.54 | 2.2 | 0.09 | 7.09 | -390 |
| MW-106 | 04/14/2011 | 15:15 | Low Flow | 21.99 | 3.74 | 7.07 | 6.96 | -389 |
| MW-106 | 09/27/2011 | 12:03 | Low Flow | 26.64 | 3.83 | 0.22 | 6.67 | -370 |
| MW-107 | 04/13/2011 | 13:55 | Low Flow | 20.48 | 2.19 | 3.05 | 7.04 | -130 |
| MW-107 | 09/16/2011 | 9:16 | Low Flow | 22.41 | 1.907 | 0.09 | 6.79 | -340 |
| MW-108 | 04/11/2011 | 12:55 | Low Flow | 19.79 | 3.82 | 2.86 | 7.01 | -372 |
| MW-108 | 09/27/2011 | 13:26 | Low Flow | 24.53 | 4.007 | 0.42 | 6.77 | -340 |
| MW-109 | 04/01/2011 | 9:45 | Low Flow | 22.70 | 3.71 | 2.35 | 7.02 | -141 |
| MW-109 | 09/15/2011 | 11:42 | Low Flow | 22.81 | 3.433 | 0.24 | 6.91 | -390 |
| MW-110 | 04/01/2011 | 10:30 | Low Flow | 22.40 | 2.39 | 2.41 | 7.17 | -167 |
| MW-110 | 09/15/2011 | 12:30 | Low Flow | 22.53 | 2.355 | 0.15 | 7.07 | -390 |
| NCL-31 | 04/11/2011 | 12:05 | Low Flow | 19.35 | 3.26 | 3.08 | 7.01 | -168 |
| NCL-31 | 09/27/2011 | 14:17 | Low Flow | 22.69 | 3.048 | 0.26 | 6.73 | -320 |
| NCL-32 | 04/11/2011 | 13:30 | Low Flow | 20.92 | 2.19 | 16.29 | 8.09 | -221 |
| NCL-33 | 04/11/2011 | 14:45 | Low Flow | 20.62 | 3.31 | 3.81 | 6.72 | -28 |
| NCL-33 | 09/26/2011 | 15:35 | Low Flow | 24.50 | 2.999 | 0.1 | 6.5 | -370 |
| NCL-44 | 04/11/2011 | 14:15 | Low Flow | 20.16 | 2.28 | 4.78 | 6.86 | -166 |
| NCL-44 | 09/26/2011 | 14:52 | Low Flow | 24.35 | 2.123 | 0.2 | 6.62 | -360 |
| NCL-49 | 04/08/2011 | 13:00 | Low Flow | 27.49 | 3.43 | 3.47 | 7.07 | 128 |
| NCL-49 | 09/15/2011 | 13:55 | Low Flow | 25.83 | 3.144 | 2.23 | 6.87 | -290 |
| NP-1 | 04/07/2011 | 12:55 | Low Flow | 18.11 | 6.22 | 3.26 | 7.02 | 509 |
| NP-1 | 09/22/2011 | 8:20 | Low Flow | 19.43 | 5.081 | 0.18 | 6.79 | -340 |
| NP-5 | 04/07/2011 | 11:40 | Low Flow | 17.63 | 6.13 | 3.51 | 7.33 | -89 |

# Table 2 - Well Purging and Water Quality Measurement Data

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Well | Date | Time | Purge Method | Temperature (°C) | Conductivity (S/m) | DO (mg/L) | pH (std units) | ORP (mV) |
|---|---|---|---|---|---|---|---|---|
| NP-6 | 04/07/2011 | 13:25 | Low Flow | 17.99 | 6.9 | 3.83 | 7.07 | 250 |
| OCD-1R | 03/31/2011 | 14:05 | Low Flow | 18.46 | 12.5 | 2.74 | 7.43 | -124 |
| OCD-1R | 09/20/2011 | 10:15 | Low Flow | 22.58 | 14.29 | 0.46 | 7.11 | -350 |
| OCD-2A | 03/31/2011 | 14:45 | Low Flow | 18.88 | 9.5 | 2.38 | 7.31 | -59 |
| OCD-2A | 09/20/2011 | 11:03 | Low Flow | 21.45 | 6.299 | 0.25 | 7.28 | -370 |
| OCD-3 | 03/31/2011 | 15:25 | Low Flow | 20.1 | 7.2 | 2.67 | 7.22 | -40 |
| OCD-3 | 09/20/2011 | 11:36 | Low Flow | 22.22 | 4.439 | 0.3 | 7.23 | -390 |
| OCD-4 | 04/04/2011 | 10:36 | Low Flow | 18.44 | 20.2 | 1.46 | 7.36 | -129 |
| OCD-4 | 09/20/2011 | 12:20 | Low Flow | 23.62 | 16.87 | 0.37 | 7.11 | -360 |
| OCD-5 | 04/04/2011 | 11:10 | Low Flow | 17.78 | 19.4 | 1.66 | 7.45 | -154 |
| OCD-5 | 09/20/2011 | 13:25 | Low Flow | 22.64 | 16.17 | 0.28 | 7.12 | -360 |
| OCD-6 | 03/31/2011 | 9:15 | Low Flow | 17.02 | 17.6 | 2.43 | 7.21 | -133 |
| OCD-6 | 09/19/2011 | 12:31 | Low Flow | 20.76 | 14.41 | 0.3 | 7.02 | -320 |
| OCD-7AR | 03/29/2011 | 16:05 | Low Flow | 18.42 | 13.2 | 2.47 | 7.2 | -102 |
| OCD-7AR | 09/19/2011 | 13:10 | Low Flow | 23.08 | 11.32 | 0.09 | 6.98 | -340 |
| OCD-7B | 03/29/2011 | 15:00 | Low Flow | 24.48 | 5.88 | 2.31 | 7.35 | 23 |
| OCD-8A | 04/04/2011 | 10:50 | Low Flow | 17.13 | 16.1 | 1.75 | 7.23 | -140 |
| OCD-8A | 09/20/2011 | 14:00 | Low Flow | 23.94 | 13.69 | 0.19 | 6.91 | -350 |
| OCD-8B | 04/04/2011 | 12:30 | Low Flow | 18.86 | 9.03 | 2.16 | 7.48 | -193 |
| RA-313 | 04/15/2011 | 11:10 | Tap | 22.52 | 1.44 | 16.5 | 7.9 | -204 |
| RA-1227 | 04/15/2011 | 11:35 | Tap | 19.11 | 3.5 | 19.87 | 7.65 | -95 |
| RA-3156 | 04/15/2011 | 11:55 | Tap | 16.50 | 3.6 | 19.99 | 7.74 | -55 |
| RA-3156 | 09/29/2011 | 12:05 | Tap | 21.49 | 3.116 | 3.72 | 6.91 | -260 |
| RA-4196 | 04/15/2011 | 13:00 | Tap | 24.42 | 2.78 | 14 | 7.86 | -105 |
| RA-4196 | 09/29/2011 | 11:54 | Tap | 29.17 | 2.663 | 1.61 | 7.21 | -250 |
| RA-4798 | 04/15/2011 | 13:25 | Tap | 19.45 | 1.97 | 12.1 | 7.99 | -66 |
| RA-4798 | 09/29/2011 | 11:40 | Tap | 19.82 | 1.821 | 1.79 | 7.08 | -300 |
| RW-4 | 04/14/2011 | 17:20 | Low Flow | 21.96 | 2.99 | 5.61 | 7.09 | -352 |
| RW-9 | 04/14/2011 | 12:45 | Low Flow | 19.26 | 4.05 | 10.82 | 6.99 | -375 |
| RW-10 | 04/14/2011 | 13:45 | Low Flow | 20.08 | 3.59 | 9.43 | 7.8 | -158 |
| RW-16 | 04/11/2011 | 17:20 | Low Flow | 18.90 | 6.19 | 2.99 | 6.93 | -75 |
| RW-17 | 04/11/2011 | 16:36 | Low Flow | 18.52 | 7.01 | 2.99 | 7.4 | 6 |
| RW-18 | 04/08/2011 | 7:40 | Low Flow | 16.84 | 5.86 | 4.14 | 7.17 | 133 |
| TEL-1 | 04/12/2011 | 8:40 | Low Flow | 19.74 | 3.8 | 3.48 | 6.9 | -167 |
| TEL-1 | 09/27/2011 | 7:50 | Low Flow | 21.22 | 3.698 | 0.08 | 6.72 | -310 |
| TEL-2 | 04/12/2011 | 9:10 | Low Flow | 19.55 | 3.63 | 2.75 | 6.8 | -368 |
| TEL-2 | 09/27/2011 | 8:29 | Low Flow | 22.30 | 3.314 | 0.14 | 6.62 | -350 |
| TEL-3 | 04/12/2011 | 9:45 | Low Flow | 18.68 | 3.17 | 3.24 | 6.8 | -357 |
| TEL-3 | 09/27/2011 | 9:06 | Low Flow | 21.75 | 2.926 | 0.33 | 6.53 | -320 |
| TEL-4 | 04/12/2011 | 10:15 | Low Flow | 20.09 | 4.33 | 3.22 | 6.77 | -348 |
| TEL-4 | 09/27/2011 | 9:40 | Low Flow | 23.54 | 3.9 | 0.04 | 6.52 | -340 |
| UG-1 | 03/30/2011 | 12:25 | Low Flow | 22.10 | 3.46 | 4.33 | 7.12 | 126 |
| UG-2 | 03/30/2011 | 11:30 | Low Flow | 21.70 | 2.17 | 3.29 | 7.3 | 124 |
| UG-3R | 03/30/2011 | 13:30 | Submersible | 20.79 | 2.19 | 5.83 | 7.06 | 146 |

# Table 2 - Well Purging and Water Quality Measurement Data

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

**Definitions:**

°C = degrees Celsius
DO = dissolved oxygen
mg/L = milligrams per liter
mV = milliVolts
ORP = oxidation/reduction potential
S/m = Siemens per meter
std units = standard pH units

**Purge Methods:**

Low Flow = peristaltic pump with dedicated tubing, purged until parameters stabilized
Submersible = submersible electric pump with dedicated tubing, purged minimum of 3 well volumes
Tap = irrigation well sample collected from tap or valve nearest well

**Notes:**

| | |
|---|---|
| X | Indicates that the DO concentration equal to X is suspect as the concentration of DO in air saturated water at sea level is 8.6 mg/L. The high DO concentrations are likely due to an incorrectly calibrated DO meter. |

# Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Level

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Analyte | NMED GW Human Health (20.6.2.3103.A) | NMED GW Domestic (20.6.2.3103.B) | NMED GW Irrigation (20.6.2.3103.C) | EPA MCL | NMED Tap Water (Table A-1) | NMED TPH (Table 6-2) | Critical Groundwater Screening Level (CGWSL) | CGWSL Source |
|---|---|---|---|---|---|---|---|---|
| **Total Petroleum Hydrocarbons (mg/L)** | | | | | | | | |
| TPH - Gasoline Range Organics (GRO) | | | | | | | -- | -- |
| TPH - Diesel Range Organics (DRO) | | | | | | 2.00E-01 | 2.00E-01 | NMED TPH |
| TPH - Oil Range Organics (ORO) | | | | | | 2.00E-01 | 2.00E-01 | NMED TPH |
| **VOCs (µg/L)** | | | | | | | | |
| 1,1,1-Trichloroethane | 6.00E+01 | | | 2.00E+02 | | | 6.00E+01 | NMED GW Human Health (20.6.2.3103.A) |
| 1,1,2,2-Tetrachloroethane | 1.00E+01 | | | | | | 1.00E+01 | NMED GW Human Health (20.6.2.3103.A) |
| 1,1,2,2-Tetrachloroethene | 2.00E+01 | | | | | | 2.00E+01 | NMED GW Human Health (20.6.2.3103.A) |
| 1,1,2-Trichloroethane | 1.00E+01 | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| 1,1,2-Trichloroethene | 1.00E+02 | | | | | | 1.00E+02 | NMED GW Human Health (20.6.2.3103.A) |
| 1,1-Dichloroethane | 2.50E+01 | | | | | | 2.50E+01 | NMED GW Human Health (20.6.2.3103.A) |
| 1,1-Dichloroethene | | | | 7.00E+00 | | | 7.00E+00 | EPA MCL |
| 1,2-Dibromo-3-chloropropane | | | | 2.00E-01 | | | 2.00E-01 | EPA MCL |
| 1,2-Dibromoethane (EDB) | 1.00E-01 | | | 5.00E-02 | | | 5.00E-02 | EPA MCL |
| 1,2-Dichloroethane | 1.00E+01 | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| 1,2-Dichloroethene | | | | | | | -- | -- |
| 1,2-Dichloropropane | | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| 2-Butanone (MEK) | | | | | 7.06E+03 | | 7.06E+03 | NMED Tap Water (Table A-1) |
| 4-Methyl-2-Pentanone (MIBK) | | | | | 1.99E+03 | | 1.99E+03 | NMED Tap Water (Table A-1) |
| Acetone | | | | | 2.18E+04 | | 2.18E+04 | NMED Tap Water (Table A-1) |
| Benzene | 1.00E+01 | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| Bromodichloromethane | | | | | 1.17E+00 | | 1.17E+00 | NMED Tap Water (Table A-1) |
| Bromomethane | | | | | 8.66E+00 | | 8.66E+00 | NMED Tap Water (Table A-1) |
| Carbon Disulfide | | | | | 1.04E+03 | | 1.04E+03 | NMED Tap Water (Table A-1) |
| Carbon tetrachloride | 1.00E+01 | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| Chlorobenzene | | | | 1.00E+02 | | | 1.00E+02 | EPA MCL |
| Chlorodibromomethane (dibromochloromethane) | | | | 8.00E+01 | | | 8.00E+01 | EPA MCL |
| Chloroethane (ethyl chloride) | | | | | 2.09E+04 | | 2.09E+04 | NMED Tap Water (Table A-1) |
| Chloroform | 1.00E+02 | | | 8.00E+01 | | | 8.00E+01 | EPA MCL |
| Chloromethane | | | | | 1.88E+02 | | 1.88E+02 | NMED Tap Water (Table A-1) |
| cis-1,2-Dichloroethene | | | | 7.00E+01 | | | 7.00E+01 | EPA MCL |
| cis-1,3-Dichloropropene | | | | | 4.33E+00 | | 4.33E+00 | NMED Tap Water (Table A-1) |
| Dibromochloromethane | | | | 8.00E+01 | | | 8.00E+01 | EPA MCL |
| Dichlorodifluoromethane | | | | | 2.03E+02 | | 2.03E+02 | NMED Tap Water (Table A-1) |
| Ethylbenzene | 7.50E+02 | | | 7.00E+02 | | | 7.00E+02 | EPA MCL |
| Isopropylbenzene (cumene) | | | | | 6.79E+02 | | 6.79E+02 | NMED Tap Water (Table A-1) |
| m-Xylene | | | | | 2.03E+02 | | 2.03E+02 | NMED Tap Water (Table A-1) |
| Methyl acetate | | | | | 3.65E+04 | | 3.65E+04 | NMED Tap Water (Table A-1) |
| Methylene chloride (dichloromethane) | 1.00E+02 | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| Naphthalene | 3.00E+01 | | | | | | 3.00E+01 | NMED GW Human Health (20.6.2.3103.A) |
| tert-Butyl methyl ether (MTBE) | | | | | 1.25E+02 | | 1.25E+02 | NMED Tap Water (Table A-1) |
| o-Xylene | | | | | 2.03E+02 | | 2.03E+02 | NMED Tap Water (Table A-1) |
| Styrene | | | | 1.00E+02 | | | 1.00E+02 | EPA MCL |
| Tetrachloroethene | | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| Toluene | 7.50E+02 | | | 1.00E+03 | | | 7.50E+02 | NMED GW Human Health (20.6.2.3103.A) |
| trans-1,2-Dichloroethene | | | | 1.00E+02 | | | 1.00E+02 | EPA MCL |
| Trichloroethylene | | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |

# Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Level

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Analyte | NMED GW Human Health (20.6.2.3103.A) | NMED GW Domestic (20.6.2.3103.B) | NMED GW Irrigation (20.6.2.3103.C) | EPA MCL | NMED Tap Water (Table A-1) | NMED TPH (Table 6-2) | Critical Groundwater Screening Level (CGWSL) | CGWSL Source |
|---|---|---|---|---|---|---|---|---|
| Trichloroethene | | | | 5.00E+00 | | | 5.00E+00 | EPA MCL |
| Trichlorofluoromethane | | | | | 1.29E+03 | | 1.29E+03 | NMED Tap Water (Table A-1) |
| Vinyl chloride | 1.00E+00 | | | 2.00E+00 | | | 1.00E+00 | NMED GW Human Health (20.6.2.3103.A) |
| Xylenes | 6.20E+02 | | | 1.00E+04 | | | 6.20E+02 | NMED GW Human Health (20.6.2.3103.A) |
| **SVOCs (ug/L)** | | | | | | | | |
| 1,2,4-Trichlorobenzene | | | | 7.00E+01 | | | 7.00E+01 | EPA MCL |
| 1,2-Dichlorobenzene | | | | 6.00E+02 | | | 6.00E+02 | EPA MCL |
| 1,4-Dichlorobenzene | | | | 7.50E+01 | | | 7.50E+01 | EPA MCL |
| 2,4,5-Trichlorophenol | | | | | 3.65E+03 | | 3.65E+03 | NMED Tap Water (Table A-1) |
| 2,4,6-Trichlorophenol | | | | | 3.65E+01 | | 3.65E+01 | NMED Tap Water (Table A-1) |
| 2,4-Dichlorophenol | | | | | 1.10E+02 | | 1.10E+02 | NMED Tap Water (Table A-1) |
| 2,4-Dimethylphenol | | | | | 7.30E+02 | | 7.30E+02 | NMED Tap Water (Table A-1) |
| 2,4-Dinitrophenol | | | | | 7.30E+01 | | 7.30E+01 | NMED Tap Water (Table A-1) |
| 2,4-Dinitrotoluene | | | | | 2.17E+00 | | 2.17E+00 | NMED Tap Water (Table A-1) |
| 2,6-Dinitrotoluene | | | | | 3.65E+01 | | 3.65E+01 | NMED Tap Water (Table A-1) |
| 2-Chloronaphthalene | | | | | 2.92E+03 | | 2.92E+03 | NMED Tap Water (Table A-1) |
| 2-Chlorophenol | | | | | 1.83E+02 | | 1.83E+02 | NMED Tap Water (Table A-1) |
| 3,3'-Dichlorobenzidine | | | | | 1.49E+00 | | 1.49E+00 | NMED Tap Water (Table A-1) |
| 4,6-Dinitro-2-methylphenol | | | | | 2.92E+00 | | 2.92E+00 | NMED Tap Water (Table A-1) |
| Acenaphthene | | | | | 2.19E+03 | | 2.19E+03 | NMED Tap Water (Table A-1) |
| Anthracene | | | | | 1.10E+04 | | 1.10E+04 | NMED Tap Water (Table A-1) |
| Benzo(a)anthracene | | | | | 2.95E-01 | | 2.95E-01 | NMED Tap Water (Table A-1) |
| Benzo(a)pyrene | 7.00E-01 | | | 2.00E-01 | | | 2.00E-01 | EPA MCL |
| Benzo(b)fluoranthene | | | | | 2.95E-01 | | 2.95E-01 | NMED Tap Water (Table A-1) |
| Benzo(k)fluoranthene | | | | | 2.95E+00 | | 2.95E+00 | NMED Tap Water (Table A-1) |
| bis(2-Chloroethyl) ether | | | | | 1.19E-01 | | 1.19E-01 | NMED Tap Water (Table A-1) |
| bis(2-Ethylhexyl)phthalate | | | | 6.00E+00 | | | 6.00E+00 | EPA MCL |
| Chrysene | | | | | 2.95E+01 | | 2.95E+01 | NMED Tap Water (Table A-1) |
| Dibenz(a,h)anthracene | | | | | 2.95E-02 | | 2.95E-02 | NMED Tap Water (Table A-1) |
| Diethyl phthalate | | | | | 2.92E+04 | | 2.92E+04 | NMED Tap Water (Table A-1) |
| Dimethyl phthalate | | | | | 3.65E+05 | | 3.65E+05 | NMED Tap Water (Table A-1) |
| Di-n-butyl phthalate | | | | | 3.65E+03 | | 3.65E+03 | NMED Tap Water (Table A-1) |
| Fluoranthene | | | | | 1.46E+03 | | 1.46E+03 | NMED Tap Water (Table A-1) |
| Fluorene | | | | | 1.46E+03 | | 1.46E+03 | NMED Tap Water (Table A-1) |
| Hexachloro-1,3-butadiene | | | | | 8.62E+00 | | 8.62E+00 | NMED Tap Water (Table A-1) |
| Hexachlorobenzene | | | | 1.00E+00 | | | 1.00E+00 | EPA MCL |
| Hexachlorocyclopentadiene | | | | 5.00E+01 | | | 5.00E+01 | EPA MCL |
| Hexachloroethane | | | | | 1.68E+01 | | 1.68E+01 | NMED Tap Water (Table A-1) |
| Indeno(1,2,3-c,d)pyrene | | | | | 2.95E-01 | | 2.95E-01 | NMED Tap Water (Table A-1) |
| Isophorone | | | | | 7.07E+02 | | 7.07E+02 | NMED Tap Water (Table A-1) |
| Naphthalene | 3.00E+01 | | | | | | 3.00E+01 | NMED GW Human Health (20.6.2.3103.A) |
| Nitrobenzene | | | | | 1.22E+00 | | 1.22E+00 | NMED Tap Water (Table A-1) |
| N-Nitrosodiphenylamine | | | | | 1.37E+02 | | 1.37E+02 | NMED Tap Water (Table A-1) |
| Pentachlorophenol | | | | 1.00E+00 | | | 1.00E+00 | EPA MCL |
| Phenanthrene | | | | | 1.10E+03 | | 1.10E+03 | NMED Tap Water (Table A-1) |
| Phenol | | 5.00E+00 | | | | | 5.00E+00 | NMED GW Domestic (20.6.2.3103.B) |
| Pyrene | | | | | 1.10E+03 | | 1.10E+03 | NMED Tap Water (Table A-1) |

# Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Level

**2011 Groundwater Report**

**Navajo Refinery, Artesia, New Mexico**

| Analyte | NMED GW Human Health (20.6.2.3103.A) | NMED GW Domestic (20.6.2.3103.B) | NMED GW Irrigation (20.6.2.3103.C) | EPA MCL | NMED Tap Water (Table A-1) | NMED TPH (Table 6-2) | Critical Groundwater Screening Level (CGWSL) | CGWSL Source |
|---|---|---|---|---|---|---|---|---|
| **Metals (mg/L)** | | | | | | | | |
| Aluminum | | | 5.00E+00 | | | | 5.00E+00 | NMED GW Irrigation (20.6.2.3103.C) |
| Arsenic | 1.00E-01 | | | 1.00E-02 | | | 1.00E-02 | EPA MCL |
| Barium | 1.00E+00 | | | 2.00E+00 | | | 1.00E+00 | NMED GW Human Health (20.6.2.3103.A) |
| Boron | | | 7.50E-01 | | | | 7.50E-01 | NMED GW Irrigation (20.6.2.3103.C) |
| Cadmium | 1.00E-02 | | | 5.00E-03 | | | 5.00E-03 | EPA MCL |
| Chromium | 5.00E-02 | | | 1.00E-01 | | | 5.00E-02 | NMED GW Human Health (20.6.2.3103.A) |
| Cobalt | | | 5.00E-02 | | | | 5.00E-02 | NMED GW Irrigation (20.6.2.3103.C) |
| Copper | | 1.00E+00 | | 1.30E+00 | | | 1.00E+00 | NMED GW Domestic (20.6.2.3103.B) |
| Iron | | 1.00E+00 | | | | | 1.00E+00 | NMED GW Domestic (20.6.2.3103.B) |
| Lead | 5.00E-02 | | | 1.50E-02 | | | 1.50E-02 | EPA MCL |
| Manganese | | 2.00E-01 | | | | | 2.00E-01 | NMED GW Domestic (20.6.2.3103.B) |
| Mercury | 2.00E-03 | | | 2.00E-03 | | | 2.00E-03 | NMED GW Human Health (20.6.2.3103.A) |
| Molybdenum | | | 1.00E+00 | | | | 1.00E+00 | NMED GW Irrigation (20.6.2.3103.C) |
| Nickel | | | 2.00E-01 | | | | 2.00E-01 | NMED GW Irrigation (20.6.2.3103.C) |
| Selenium | 5.00E-02 | | | 5.00E-02 | | | 5.00E-02 | NMED GW Human Health (20.6.2.3103.A) |
| Silver | 5.00E-02 | | | | | | 5.00E-02 | NMED GW Human Health (20.6.2.3103.A) |
| Zinc | | 1.00E+01 | | | | | 1.00E+01 | NMED GW Domestic (20.6.2.3103.B) |
| **Water Quality Parameters (mg/L, unless noted)** | | | | | | | | |
| Chloride | | 2.50E+02 | | | | | 2.50E+02 | NMED GW Domestic (20.6.2.3103.B) |
| Cyanide | 2.00E-01 | | | 2.00E-01 | | | 2.00E-01 | NMED GW Human Health (20.6.2.3103.A) |
| Fluoride | 1.60E+00 | | | | | | 1.60E+00 | NMED GW Human Health (20.6.2.3103.A) |
| Nitrate (NO3 as N) | 1.00E+01 | | | 1.00E+01 | | | 1.00E+01 | NMED GW Human Health (20.6.2.3103.A) |
| pH (Std pH units) | | 6 to 9 | | | | | 6 to 9 | NMED GW Domestic (20.6.2.3103.B) |
| Sulfate | | 6.00E+02 | | | | | 6.00E+02 | NMED GW Domestic (20.6.2.3103.B) |
| Total Dissolved Solids | | 1.00E+03 | | | | | 1.00E+03 | NMED GW Domestic (20.6.2.3103.B) |

mg/L = milligrams per liter

ug/L = micrograms per liter

CGWSL = Critical Groundwater Screening Level

Heirarchy of selecting the CGWSL is as follows:

1. Lowest of either NMED GW Standard (20.6.2.3103) or EPA MCL was selected.
2. If no NMED GW Standard or EPA MCL available, then NMED Tap Water value from SSG Table A-1, if available.
3. NMED TPH screening for "unknown oil" used for both DRO and ORO range TPH.

CGWSL Source = Source for CGWSL value

EPA MCL = EPA Maximum Contaminant Level from "Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites"

NMED GW Domestic = NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B

NMED GW Human Health = NMED Groundwater standard for human health exposure taken from 20.6.2.3103.A

NMED GW Irrigation = NMED Groundwater standard for irrigation exposure taken from 20.6.2.3103.C

NMED Tap Water = New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, February 2012, Tap Water Screening Level

NMED TPH = New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, February 2012, TPH Screening Guidelines for Potable Groundwater

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Analyte Group:** | **TPH** | | **Total Metals** | | | | | | | | | |
| | | | **Analyte:** | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | | **Units:** | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | | **CGWSL:** | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | | **CGWSL Source:** | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| NCL | MW-18 | Apr-09 | | < 0.020 | **0.28** | < 0.0100 | **0.0135** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0100 | |
| | | Sep-09 | | < 0.0500 | **0.38** | < 0.00500 | **0.0118** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00821** | |
| | | Mar-10 | | | **0.18** | < 0.00500 | **0.0178** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00748** | |
| | | Oct-10 | | | **0.48** | < 0.00500 | **0.0147** | < 0.00500 | < 0.200 | < 0.00500 | **0.156** | < 0.000200 | **0.00747 J** | **0.00716** | **0.0161** |
| | | Apr-11 | | | **0.19 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.027** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | | **0.19** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.192** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-54A | Apr-09 | | | **0.42** | < 0.0100 | **0.0167** | < 0.0012 | | < 0.0100 | | | | < 0.0050 | |
| | | Oct-09 | | | **0.30** | | | | | | | | | | |
| | | Oct-09 | FD | | **0.29** | | | | | | | | | | |
| | | Apr-10 | | | **0.40** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | **0.32** | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **0.467** | | | < 0.0500 | |
| | | Apr-11 | | | **0.47** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.493** | | | < 0.025 | |
| | | Sep-11 | | | **0.25** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.523** | | | < 0.0250 | |
| | MW-54B | Apr-10 | | < 0.0500 | **0.33** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.112** | | | < 0.025 | |
| | MW-108 | Oct-09 | | **2.55** | **8.2** | | | | | | | | | | |
| | | Mar-10 | | | **1.6** | **0.00555** | **0.0479** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | **5.9** | **< 0.0250** | **0.155** | **0.0387** | | **0.0361** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | **1.8** | **< 0.0250** | **0.0615** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0856** | | | < 0.0250 | |
| | | Apr-11 | | | **0.79 J** | **< 0.025** | **0.0524** | < 0.025 | < 1 | **< 0.025** | **0.0801** | | | < 0.025 | |
| | | Apr-11 | FD | | **1.3 J** | **< 0.025** | **0.055** | < 0.025 | < 1 | **< 0.025** | **0.0748** | | | < 0.025 | |
| | | Sep-11 | | | **0.47** | **< 0.0250** | **0.0528** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0874** | | | < 0.0250 | |
| | NCL-31 | Mar-10 | | | **0.65** | **0.00731** | **0.0246** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | | **0.56** | **< 0.0250** | **0.0312** | < 0.0250 | < 1.00 | **< 0.0250** | **1.16** | | | < 0.0250 | |
| | | Apr-11 | | | **0.32 J** | **< 0.025** | **0.0358** | < 0.025 | < 1 | **< 0.025** | **2.21** | | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | | **0.11** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **1.90** | | | < 0.0250 | |
| | NCL-32 | Apr-09 | | | **2.1** | < 0.0100 | **0.143** | **0.0442** | | **0.0294** | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.21** | **0.0389** | **1.15** | **0.383** | **55.5** | **0.267** | **1.84** | **0.000223** | | **0.00667** | |
| | | Mar-10 | | | < 0.050 | **0.0664** | **1.74** | **0.593** | | **0.415** | | < 0.000200 | | **0.0125** | |
| | | Oct-10 | | | **0.48** | **< 0.0250** | **0.0413** | < 0.0250 | < 1.00 | **< 0.0250** | **0.149** | | | < 0.0250 | |
| | NCL-33 | Apr-09 | | | **0.52** | < 0.0100 | **0.0229** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.60** | < 0.00500 | **0.0240** | < 0.00500 | **3.70** | < 0.00500 | **0.127** | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | | **0.64** | < 0.00500 | **0.0263** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | | **0.57** | **< 0.0250** | **0.0253** | < 0.0250 | **4.35** | **< 0.0250** | **0.126** | | | < 0.0250 | |
| | | Apr-11 | | | **0.54 J** | **< 0.025** | < 0.025 | < 0.025 | **2.13** | **< 0.025** | **0.115** | | | < 0.025 | |
| | | Sep-11 | | | **0.23** | **< 0.0250** | < 0.0250 | < 0.0250 | **2.61** | **< 0.0250** | **0.0955** | | | < 0.0250 | |
| | NCL-34 | Apr-09 | | | **0.12** | < 0.0100 | **0.608** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **1.7** | < 0.00500 | **0.317** | < 0.00500 | < 0.200 | < 0.00500 | **0.0337** | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | | **0.95 J** | < 0.00500 | **0.370 J** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | FD | | **1.8 J** | **0.00568** | **0.0538 J** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | | **0.95** | **< 0.0250** | **0.349** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0393** | | | < 0.0250 | |
| | | Oct-10 | FD | | **1.3** | < 0.00500 | **0.342** | < 0.00500 | < 0.200 | < 0.00500 | **0.0339** | | | < 0.00500 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| NCL (continued) | NCL-44 | Apr-09 | | | **0.62** | **0.0436** | **0.0273** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.66** | **0.0598** | **0.0276** | < 0.00500 | **1.52** | < 0.00500 | **0.756** | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | | **0.60** | **0.0440** | **0.0298** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | | **0.63** | **0.0543 J** | **0.0267** | < 0.0250 | **1.40** | **< 0.0250** | **0.716** | | | < 0.0250 | |
| | | Apr-11 | | | **0.51 J** | **0.0584** | **0.0297** | < 0.025 | **1.78** | **< 0.025** | **0.798** | | | < 0.025 | |
| | | Sep-11 | | | **0.063** | **0.0506** | < 0.0250 | < 0.0250 | **1.33** | **< 0.0250** | **0.615** | | | < 0.0250 | |
| | NCL-49 | Apr-09 | | | < 0.020 | < 0.0018 | **0.0117** | < 0.0012 | | < 0.0100 | | | | < 0.0100 | |
| | | Apr-09 | FD | | < 0.020 | < 0.0018 | **0.0115** | < 0.0012 | | < 0.0100 | | | | < 0.0100 | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | | | < 0.0500 | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | RW-17A | Mar-10 | | < 0.0500 | **0.13** | **0.00876** | **0.0224** | < 0.00500 | | **0.00885** | | < 0.000200 | | **0.00820** | |
| TEL | TEL-1 | Apr-09 | | **0.567** | **1.7** | < 0.0100 | **0.0125** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Apr-09 | FD | **0.580** | **3.2** | **0.0107** | **0.0132** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.400** | **2.9** | **0.00662** | **0.0112** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.210** | **1.9** | < 0.00500 | **0.0130** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.430** | **5.0 J** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0818** | | | < 0.0250 | |
| | | Apr-11 | | **0.28** | **2.4 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0796** | | | < 0.025 | |
| | | Sep-11 | | **0.173** | **1.8** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0564** | | | < 0.0250 | |
| | TEL-2 | Apr-09 | | **5.08** | **3.3** | **0.0112** | **0.0761** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **5.05** | **4.3** | **0.00979** | **0.0547** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **5.62** | **7.8** | **0.00999** | **0.0753** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **4.67** | **5.4 J** | **< 0.0250** | **0.0452** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **5.15** | **2.9 J** | **< 0.025** | **0.0528** | < 0.025 | < 1 | **< 0.025** | **0.0258** | | | < 0.025 | |
| | | Sep-11 | | **4.74** | **0.88** | **< 0.0250** | **0.0518** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | TEL-3 | Apr-09 | | **2.04** | **2.6** | < 0.0100 | **0.0177** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.814** | **1.4** | < 0.00500 | **0.0140** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.556** | **2.3 J** | < 0.00500 | **0.0109** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | FD | **0.603** | **1.3 J** | < 0.00500 | **0.0109** | < 0.00500 | | < 0.0100 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.688** | **1.4** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **0.778** | **1 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **0.558** | **0.25** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | TEL-4 | Apr-09 | | **2.61** | **1.8** | **0.0120** | **0.0409** | **0.0567** | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.92** | **1.9** | **0.0129** | **0.0349** | **0.0118** | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **1.65** | **3.6** | **0.00810** | **0.0269** | **0.00710** | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **1.70** | **2.0** | **< 0.0250** | < 0.0250 | **0.0648** | < 1.00 | **< 0.0250** | **1.02** | | | < 0.0250 | |
| | | Apr-11 | | **1.7** | **1.5 J** | **< 0.025** | **0.0329** | **0.0424** | < 1 | **< 0.025** | **1.11** | | | < 0.025 | |
| | | Sep-11 | | **1.97** | **1.3** | **< 0.0250** | **0.0281** | **0.0912** | < 1.00 | **< 0.0250** | **0.728** | | | < 0.0250 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP | MW-1R | Apr-09 | | | < 0.020 | < 0.0100 | **0.0250** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | < 0.050 | < 0.00500 | **0.0200** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | **0.98** | < 0.0100 | **0.0204** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0113** | |
| | | Mar-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | **2.29** | **< 0.025** | **1.58** | | | < 0.025 | |
| | MW-2A | Apr-09 | | < 0.0500 | **0.099** | **0.0142** | **0.0266** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Apr-09 | | **5.78** | **2.2** | **0.302** | **0.0141** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.094** | **0.0131** | **0.0199** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | < 0.0500 | < 0.050 | **0.0187** | **0.0236** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0250** | **0.0343** | < 0.0250 | **7.90** | **< 0.0250** | **4.00** | | | < 0.0250 | |
| | | Oct-10 | FD | < 0.0500 | **3.6 J** | **< 0.0250 UJ** | **0.0332** | < 0.0250 | **7.45 J** | **< 0.0250** | **3.68 J** | | | < 0.0250 | |
| | | Mar-11 | | < 0.05 | **0.069** | **< 0.025 UJ** | **0.0254** | < 0.025 | **2.34** | **< 0.025** | **2.42** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | < 0.050 | **0.0370** | **0.0201** | < 0.00500 | **6.20** | < 0.00500 | **1.38** | | | < 0.00500 | |
| | MW-2B | Apr-10 | | | < 0.050 | < 0.0100 | **0.0113** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | MW-3 | Apr-09 | | **0.270** | **1.0** | **0.0300** | **0.0145** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.447** | **1.3** | **0.0413** | **0.0152** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.201** | **1.2** | **0.0278** | **0.0130** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.526** | **1.4** | **0.0524** | **0.0164** | < 0.00500 | **1.34** | < 0.0100 | **1.47** | | | < 0.00500 | |
| | | Mar-11 | | **0.291** | **1.7** | **0.0348** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **1.05** | | | < 0.025 | |
| | | Sep-11 | | **0.271** | **0.55** | **0.0484** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **2.12** | | | < 0.0250 | |
| | MW-4A | Apr-09 | | **0.328** | **0.79** | **0.0930** | **0.0146** | < 0.0012 | | < 0.0100 | | | | < 0.0050 | |
| | | Sep-09 | | **0.339** | **0.97** | **0.157** | **0.0127** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.236** | < 0.050 | **0.0748** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-10 | FD | **0.268** | **1.1** | **0.0812** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | | | | | | | | | | | |
| | | Oct-10 | | **0.436** | **0.56 J** | **0.113 J** | **0.0137** | < 0.00500 | **2.79 J** | < 0.00500 | **2.13 J** | | | < 0.00500 | |
| | | Apr-11 | | **0.296** | **1.3** | **0.0934** | < 0.025 | < 0.025 | **2.38** | **< 0.025** | **1.97** | | | < 0.025 | |
| | | Sep-11 | | **0.223** | **0.50** | **0.210** | < 0.0250 | < 0.0250 | **4.03** | **< 0.0250** | **2.11** | | | < 0.0250 | |
| | MW-4B | Apr-10 | | | **0.57** | **0.0730** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | < 0.05 | **0.35** | **0.0409** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.965** | | | < 0.025 | |
| | MW-5A | Sep-09 | | **5.70** | **4.6** | **0.232** | **0.0143** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Sep-09 | FD | **5.54** | **4.9** | **0.235** | **0.0146** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **4.34** | **3.4** | **0.206** | **0.0130** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **4.67** | < 0.050 | **0.253** | < 0.0250 | < 0.0250 | **13.7** | **< 0.0250** | **0.980** | | | < 0.0250 | |
| | | Apr-11 | | **4.33** | **6.5** | **0.205** | < 0.025 | < 0.025 | **13.6** | **< 0.025** | **1.19** | | | < 0.025 | |
| | | Sep-11 | | **3.53** | **1.9** | **0.164** | < 0.0250 | < 0.0250 | **8.57** | **< 0.0250** | **1.21** | | | < 0.0250 | |
| | MW-5B | Apr-10 | | | **6.2** | **0.208** | < 0.0100 | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-11 | | **0.0597** | **1.3** | **0.123** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.611** | | | < 0.025 | |
| | MW-6A | Apr-09 | | **0.410** | **1.5** | **0.0141** | **0.0142** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.264** | **1.5** | **0.0112** | **0.0126** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.139** | **1.1** | **0.0102** | **0.0140** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | **0.158** | **1.5** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.258** | | | < 0.025 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | MW-6B | Apr-10 | | | **0.084** | **0.0152** | **0.0168** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **1.3 J** | | | < 0.025 | |
| | MW-7A | Apr-09 | | **0.602** | **0.51** | **0.0404** | **0.0157** | < 0.0012 | | < 0.0100 | | < 0.000200 | | < 0.0050 | |
| | | Sep-09 | | **0.510** | **0.84** | **0.0325** | **0.0146** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.462** | **0.52** | **0.0335** | **0.0164** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.483** | **0.39** | **0.0331** | **0.0164** | < 0.0100 | **5.72** | < 0.0100 | **0.402** | | | < 0.0100 | |
| | | Apr-11 | | **0.405** | **0.89** | **0.0353** | < 0.025 | < 0.025 | **6.64** | **< 0.025** | **0.409** | | | < 0.025 | |
| | | Sep-11 | | **0.320** | **0.38** | **< 0.0250** | < 0.0250 | < 0.0250 | **3.73** | **< 0.0250** | **0.366** | | | < 0.0250 | |
| | MW-7B | Apr-10 | | | **0.11 J** | **0.0136** | **0.0129** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-11 | | < 0.05 | **0.06** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.395** | | | < 0.025 | |
| | MW-10 | Apr-09 | | **1.51** | **0.97** | **0.0250** | **0.0355** | < 0.0100 | | < 0.0100 | | | | < 0.0050 | |
| | | Sep-09 | | **1.23** | **1.1** | **0.0197** | **0.00999** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **1.26** | **0.14 J** | **0.0201** | < 0.0250 | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Jun-10 | | | | **0.0204** | | | | | | | | | |
| | | Oct-10 | | **1.22** | **0.50** | **0.0231** | **0.0114** | < 0.00500 | < 0.200 | < 0.0100 | **2.50** | | | < 0.00500 | |
| | | Apr-11 | | **0.954** | **1.2** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **2.36** | | | < 0.025 | |
| | | Sep-11 | | **0.925** | **0.47** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **2.08** | | | < 0.0250 | |
| | | Sep-11 | FD | **0.853** | **0.44** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **2.01** | | | < 0.0250 | |
| | MW-11A | Apr-09 | | < 0.0500 | < 0.020 | < 0.0100 | **0.0314** | < 0.0012 | | < 0.0100 | | < 0.000200 | | < 0.0050 | |
| | | Sep-09 | | < 0.0500 | < 0.050 | < 0.0100 | **0.0319** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | | < 0.0500 | < 0.050 | **< 0.0250** | **0.0260** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-10 | FD | < 0.0500 | < 0.050 UJ | **< 0.0250** | **0.0285** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | **0.029** | < 0.025 | **6.29** | **< 0.025** | **1.7** | | | < 0.025 | |
| | MW-11B | Apr-10 | | | < 0.050 UJ | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | **0.0262** | < 0.025 | < 1 UJ | **< 0.025** | **0.168 J** | | | < 0.025 | |
| | MW-15 | Apr-09 | | **0.515** | **0.67** | **0.0958** | **0.0321** | < 0.0012 | | < 0.00080 | | | | < 0.0050 | |
| | | Sep-09 | | **0.108** | **0.16** | **0.0185** | **0.0201** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.393** | **0.070** | **0.0433** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Mar-11 | | **0.406** | **0.7** | **0.0422** | **0.035** | < 0.025 | < 1 | **< 0.025** | **2.35** | | | < 0.025 | |
| | MW-18A | Apr-09 | | | **0.24** | < 0.0100 | **0.0183** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.24** | **0.00873** | **0.0172** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | < 0.050 | **0.0144 UB** | **0.0213** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Jun-10 | | | | **0.0115** | | | | | | | | | |
| | | Oct-10 | | | **0.19** | < 0.0100 | **0.0218** | < 0.0100 | **2.75** | **< 0.0250** | **2.11** | < 0.000200 | **0.0208** | < 0.0100 | < 0.0100 |
| | | Apr-11 | | | **0.31** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **1.84** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | | **0.12** | **0.00757** | **0.0200** | < 0.00500 | **5.17** | < 0.00500 | **2.02** | < 0.000200 | **0.00509** | < 0.00500 | < 0.00500 |
| | MW-18B | Apr-10 | | | < 0.050 | **0.0126** | **0.0131** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-11 | | < 0.05 | **0.081** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.396** | | | < 0.025 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | MW-22A | Apr-09 | | **6.87** | **2.8** | **0.0561** | **0.0162** | < 0.0012 | | < 0.0100 | | | | < 0.0050 | |
| | | Sep-09 | | **6.01** | **3.0** | **0.0505** | **0.0154** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **6.18** | **2.4** | **0.0514** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-10 | FD | **6.18** | **3.1** | **0.0518** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | **6.21** | **1.1** | **0.0600** | **0.0158** | < 0.00500 | **4.04** | < 0.00500 | **5.30 J** | | | < 0.00500 | |
| | | Apr-11 | | **5.41** | **3.1** | **0.0549** | < 0.025 | < 0.025 | **5.59** | **< 0.025** | **5.49** | | | < 0.025 | |
| | | Sep-11 | | **5.62** | **1.8** | **0.0462** | < 0.0250 | < 0.0250 | **3.12** | **< 0.0250** | **4.14** | | | < 0.0250 | |
| | MW-22B | Apr-10 | | | **1.3 J** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | **0.244** | **1.3** | **0.0295** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.838** | | | < 0.025 | |
| | MW-70 | Apr-09 | | **1.42** | **0.80** | **0.0213** | **0.0148** | < 0.0012 | | < 0.0100 | | < 0.000200 | | < 0.0050 | |
| | | Sep-09 | | **1.21** | **0.28** | **0.0169** | **0.0164** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | | **1.18** | < 0.062 | **0.0237** | **0.0164** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Jun-10 | | | | **0.0211** | | | | | | | | | |
| | | Oct-10 | | **1.36** | **0.32** | **0.0202** | **0.0164** | < 0.0100 | **3.29** | < 0.0100 | **0.279** | | | < 0.0100 | |
| | | Apr-11 | | **1.18** | **0.46** | **< 0.025** | < 0.025 | < 0.025 | **4.05** | **< 0.025** | **0.411** | | | < 0.025 | |
| | | Sep-11 | | **1.30** | **0.23** | **< 0.0250** | < 0.0250 | < 0.0250 | **3.11** | **< 0.0250** | **0.233** | | | < 0.0250 | |
| | MW-72 | Mar-09 | | **110** | **0.56** | **0.0909** | **0.0147** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.299** | **0.49** | **0.125** | **0.0180** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.252** | **0.42** | **0.0807** | **0.0139** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.322** | **0.16** | **0.113** | < 0.0250 | < 0.0250 | **25.5** | **< 0.0250** | **4.57** | | | < 0.0250 | |
| | | Mar-11 | | **0.193** | **0.58** | **0.0933** | < 0.025 | < 0.025 | **27.4** | **< 0.025** | **5.35** | | | < 0.025 | |
| | | Sep-11 | | **0.189** | **0.22** | **0.0862** | **0.0151** | < 0.0100 | **13.9** | < 0.0100 | **3.99** | | | < 0.0100 | |
| | MW-73 | Mar-09 | | **12.0** | **0.98** | **0.107** | **0.0116** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.226** | **1.3** | **0.112** | **0.0125** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.545** | **1.2** | **0.110** | < 0.0100 | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **1.03** | **0.66** | **0.111** | < 0.0250 | < 0.0250 | **6.64** | **< 0.0250** | **3.02** | | | < 0.0250 | |
| | | Mar-11 | | **0.758** | **2** | **0.122** | < 0.025 | < 0.025 | **10.4** | **< 0.025** | **3.46** | | | < 0.025 | |
| | | Sep-11 | | **1.31** | **0.83** | **0.114** | **0.0651** | < 0.0100 | **9.97** | < 0.0100 | **2.82** | | | < 0.0100 | |
| | MW-74 | Mar-09 | | **6.87** | **6.0** | **0.127** | **0.0141** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.57** | **8.4** | **0.102** | **0.0163** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.0187** | |
| | | Apr-10 | | **1.35** | **9.9** | **0.0935** | **0.0132** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0463** | |
| | | Apr-10 | FD | **1.27** | **10** | **0.0905** | **0.0117** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0426** | |
| | | Oct-10 | | **1.45** | **11 J** | **0.0820** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **2.24** | | | **0.0540** | |
| | | Mar-11 | | **1.54** | **9.5** | **0.139** | < 0.025 | < 0.025 | **1.87** | **< 0.025** | **2.98** | | | < 0.025 | |
| | | Sep-11 | | **1.65** | < 0.050 | **0.130** | **0.0130** | < 0.0100 | < 1.00 | < 0.0100 | **2.51** | | | **0.0153** | |
| | MW-75 | Mar-09 | | **5.59** | **5.8** | **0.337** | **0.0177** | < 0.0100 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **3.84** | **6.2** | **0.365** | **0.0140** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Sep-09 | FD | **3.76** | **6.0** | **0.374** | **0.0149** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **2.56** | **6.3** | **0.294 J** | **0.0164** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **2.74** | **3.0 J** | **0.362** | **0.0141** | < 0.0100 | **2.97** | < 0.0100 | **1.04** | | | < 0.0100 | |
| | | Mar-11 | | **1.79** | **6.1** | **0.278** | < 0.025 | < 0.025 | **2.42** | **< 0.025** | **0.945** | | | < 0.025 | |
| | | Sep-11 | | **2.15** | **2.8** | **0.325** | **0.0124** | < 0.0100 | **1.85** | < 0.0100 | **0.833** | | | < 0.0100 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | MW-76 | Mar-09 | | **1.44** | **4.2** | **0.0627** | **0.0136** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.99** | **6.5** | **0.0723** | **0.0135** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.780** | **3.8** | **0.0774** | **0.0137** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.701** | **2.6** | **0.0737** | **0.0148** | < 0.00500 | **2.46** | < 0.0100 | **0.597 J** | | | < 0.00500 | |
| | | Mar-11 | | **0.617** | **2.6** | **0.0702** | < 0.025 | < 0.025 | **2.56** | **< 0.025** | **0.604** | | | < 0.025 | |
| | | Sep-11 | | **0.613** | **1.6** | **0.0622** | < 0.0250 | < 0.0250 | **< 2.50** | **< 0.0250** | **0.546** | | | < 0.0250 | |
| | MW-77 | Mar-09 | | **2.14** | **5.4** | **0.0931** | **0.0131** | < 0.0100 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.53** | **4.8** | **0.0856** | **0.0129** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00574** | |
| | | Apr-10 | | **0.986** | **6.1** | **0.0775** | **0.0128** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0120** | |
| | | Oct-10 | | **1.18** | **5.8 J** | **0.0769** | **0.0138** | < 0.00500 | **4.30** | **< 0.0250** | **0.637 J** | < 0.000200 | **0.0176** | **0.00667** | < 0.00500 |
| | | Mar-11 | | **1.45** | **5.7** | **0.084** | < 0.025 | < 0.025 | **3.84** | **< 0.025** | **0.877** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Mar-11 | FD | **1.42** | **5.2** | **0.0832** | < 0.025 | < 0.025 | **3.8** | **< 0.025** | **0.868** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **1.19** | **3.3** | **0.0607** | < 0.0250 | < 0.0250 | **4.57** | **< 0.0250** | **0.556** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-78 | Mar-09 | | **0.726** | **7.2** | **0.0267** | **0.0211** | **0.0242** | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.628** | **5.7** | **0.0268** | **0.0328** | **0.0421** | | < 0.00500 | | < 0.000200 | | **0.00693** | |
| | | Apr-10 | | **0.185** | **5.7** | **0.0155 UB** | **0.0306** | **0.0458** | | < 0.0100 | | < 0.000200 | | **0.0200** | |
| | | Jun-10 | | | | **0.0216** | | | | | | | | | |
| | | Mar-11 | | **0.565** | **4.9** | **< 0.025** | **0.0329** | **0.0467** | **5.24** | **< 0.025** | **0.634** | | | < 0.025 | |
| | MW-79 | Mar-09 | FD | **0.229** | **0.57** | **0.0230** | **0.0175** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0100 | |
| | | Mar-09 | | **0.235** | **0.54** | **0.0207** | **0.0186** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.183** | **0.51** | **0.0165** | **0.0182** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.156** | **0.34** | **0.0148** | **0.0184** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.116** | **0.13** | **0.0194** | **0.0183** | < 0.0100 | **3.03** | < 0.0100 | **6.05** | | | < 0.0100 | |
| | | Mar-11 | | **0.0756** | **0.3** | **0.0286** | < 0.025 | < 0.025 | **4.15** | **< 0.025** | **4.88** | | | < 0.025 | |
| | | Sep-11 | | **0.290** | **0.52** | **< 0.0250** | < 0.0250 | < 0.0250 | **< 2.50** | **< 0.0250** | **1.97** | | | < 0.0250 | |
| | MW-80 | Mar-09 | | **0.0528** | **0.11** | **0.0111** | **0.0157** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.0870** | **0.15** | **0.0146** | **0.0173** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | < 0.0500 | < 0.050 | < 0.0100 | **0.0157** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | < 0.05 | **0.06** | **< 0.025** | < 0.025 | < 0.025 | **2.44** | **< 0.025** | **2.49** | | | < 0.025 | |
| | MW-81 | Mar-09 | | **0.138** | **0.59** | **0.0164** | **0.0185** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.135** | **0.34** | **0.0114** | **0.0186** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.0892** | **0.54** | **0.0153** | **0.0158** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | **0.0716** | **0.53** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **1.46** | | | < 0.025 | |
| | MW-82 | Mar-09 | | **1.66** | **2.6** | **0.198** | **0.0255** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.61** | **3.0** | **0.184** | **0.0214** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00534** | |
| | | Apr-10 | | **1.22** | **4.2** | **0.211** | **0.0379** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | **1.45** | **3.7** | **0.158** | **0.0325** | < 0.025 | **2.64** | **< 0.025** | **1.6** | | | < 0.025 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | MW-83 | Mar-09 | | **5.32** | **7.2** | **0.133** | **0.0159** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **2.22** | **7.3** | **0.0690** | **0.0185** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00547** | |
| | | Apr-10 | | **2.18** | **5.5** | **0.0825** | **0.0162** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Jun-10 | | | | **0.0519** | | | | | | | | | |
| | | Oct-10 | | **0.950** | **7.0 J** | **0.0308** | **0.0270** | < 0.00500 | **1.25** | < 0.0100 | **0.465** | | | **0.0125** | |
| | | Mar-11 | | **1.78** | **3.4** | **0.0801** | < 0.025 | < 0.025 | **5.74** | **< 0.025** | **0.473** | | | < 0.025 | |
| | | Sep-11 | | **1.32** | **1.3** | **0.0696** | < 0.0250 | < 0.0250 | **9.33** | **< 0.0250** | **0.398** | | | < 0.0250 | |
| | MW-84 | Mar-09 | | **33.9** | **11** | **0.111** | **0.0162** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.36** | **10** | **0.143** | **0.0173** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00769** | |
| | | Apr-10 | | **0.813** | **9.3** | **0.0868** | **0.0161** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0112** | |
| | | Oct-10 | | **1.41** | **7.5 J** | **0.157** | **0.0147** | < 0.00500 | **4.82** | **< 0.0250** | **3.90** | | | **0.00809** | |
| | | Mar-11 | | **0.883** | **8.9** | **0.108** | < 0.025 | < 0.025 | **1.37** | **< 0.025** | **2.54** | | | < 0.025 | |
| | | Sep-11 | | **1.23** | **3.4** | **0.124** | < 0.0250 | < 0.0250 | **3.99** | **< 0.0250** | **2.44** | | | < 0.0250 | |
| | MW-87 | Apr-09 | | **0.0518** | **0.27** | **0.0125** | **0.0199** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.0909** | **0.25** | **0.0153** | **0.0210** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | < 0.0500 | < 0.050 | **0.0159** | **0.0188** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.0764** | **0.12** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **1.62 J** | | | < 0.0250 | |
| | | Oct-10 | FD | **0.0883** | **0.12** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250 UJ** | **1.68 J** | | | < 0.0250 | |
| | | Apr-11 | | < 0.05 | **0.28** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.224** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | **0.11** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **1.54** | | | < 0.0250 | |
| | MW-88 | Apr-09 | | **0.298** | **0.40** | **0.0140** | < 0.0100 | < 0.0012 | | < 0.0100 | | | | < 0.0050 | |
| | | Apr-09 | FD | **0.301** | **0.45** | **0.0103** | < 0.0100 | < 0.0012 | | < 0.0100 | | | | < 0.0050 | |
| | | Sep-09 | | **0.242** | **0.54** | **0.0123** | **0.00995** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Sep-09 | FD | **0.226** | **0.43** | **0.0118** | **0.00980** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.212** | **0.39** | **0.0110** | **0.0102** | < 0.00500 | | **< 0.0250** | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.158** | < 0.050 | **0.0123** | **0.0101** | < 0.0100 | < 0.400 | < 0.0100 | **0.555** | | | < 0.0100 | |
| | | Apr-11 | | **0.12** | **0.3** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.72** | | | < 0.025 | |
| | | Apr-11 | FD | **0.119** | **0.38** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.7** | | | < 0.025 | |
| | | Sep-11 | | **0.134** | **0.25** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.519** | | | < 0.0250 | |
| | OCD-1R | Apr-09 | | **0.0552** | **0.054** | < 0.0100 | **0.0193** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Apr-10 | | < 0.0500 | **0.083 J** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | **0.066** | **0.0103** | **0.0228** | < 0.0100 | **4.81** | < 0.0100 | **2.78** | | | < 0.0100 | |
| | | Mar-11 | | < 0.05 | **0.083** | **< 0.025** | < 0.025 | < 0.025 | **4.46** | **< 0.025** | **2.48** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | **0.062** | **< 0.0250** | < 0.0250 | < 0.0250 | **4.36** | **< 0.0250** | **2.18** | | | < 0.0250 | |
| | OCD-2A | Mar-09 | FD | < 0.020 | < 0.020 | < 0.0100 | **0.0257** | < 0.0012 | | < 0.00080 | | < 0.000042 | | **0.0118** | |
| | | Apr-09 | | < 0.020 | < 0.020 | < 0.0100 | **0.0251** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | < 0.0500 | < 0.050 | < 0.00500 | **0.0266** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | < 0.0500 | < 0.050 UJ | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | < 0.0100 | **0.0248** | < 0.0100 | **3.99** | < 0.0100 | **1.50** | | | < 0.0100 | |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | **1.24** | **< 0.025** | **0.752** | | | < 0.025 | |
| | | Mar-11 | FD | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | **1.22** | **< 0.025** | **0.734** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | **2.90** | **< 0.0250** | **1.05** | | | < 0.0250 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | OCD-2B | Apr-10 | | | < 0.050 UJ | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | OCD-3 | Apr-09 | | < 0.020 | < 0.020 | < 0.0100 | **0.0223** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0100 | |
| | | Sep-09 | | < 0.0500 | < 0.050 | < 0.00500 | **0.0214** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | < 0.0500 | < 0.050 UJ | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | < 0.0100 | **0.0193** | < 0.0100 | **3.65** | < 0.0100 | **0.296** | | | < 0.0100 | |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | **1.11** | **< 0.025** | **0.181** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | **2.15** | **< 0.0250** | **0.250** | | | < 0.0250 | |
| | OCD-4 | Apr-09 | | < 0.020 | < 0.020 | < 0.0100 | **0.0231** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | < 0.0500 | < 0.050 | < 0.0100 | **0.0222** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | | < 0.0500 | < 0.050 UJ | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0250** | **0.0263** | < 0.0250 | **5.05** | **< 0.0250** | **0.274** | | | < 0.0250 | |
| | | Apr-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | **5** | **< 0.025** | **0.272** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | **0.0258** | < 0.0250 | **2.28** | **< 0.0250** | **0.193** | | | < 0.0250 | |
| | OCD-5 | Apr-09 | | **0.263** | **0.22** | **0.0115** | **0.0238** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.319** | **0.21** | < 0.0100 | **0.0215** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | | **0.162** | **0.094 J** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0250** | **0.0265** | < 0.0250 | **3.57** | **< 0.0250** | **0.334** | | | < 0.0250 | |
| | | Apr-11 | | **0.0588** | **0.056** | **< 0.025** | < 0.025 | < 0.025 | **4.04** | **< 0.025** | **0.318** | | | < 0.025 | |
| | | Sep-11 | | **0.178** | **0.061** | **< 0.0250** | < 0.0250 | < 0.0250 | **3.70** | **< 0.0250** | **0.371** | | | < 0.0250 | |
| | OCD-6 | Apr-09 | | **0.527** | **0.83** | **0.0456** | **0.0168** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.486** | **0.89** | **0.0436** | **0.0170** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.307** | **0.77** | **0.0299** | **0.0167** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **0.536** | **0.75** | **0.0469** | < 0.0250 | < 0.0250 | **11.6** | **< 0.0250** | **2.24** | | | < 0.0250 | |
| | | Mar-11 | | **0.434** | **1.1** | **0.0366** | < 0.025 UJ | < 0.025 | **8.68** | **< 0.025** | **2.14** | | | < 0.025 | |
| | | Sep-11 | | **0.409** | **0.41** | **0.0317** | < 0.0250 | < 0.0250 | **10.2** | **< 0.0250** | **1.71** | | | < 0.0250 | |
| | OCD-7A | Apr-09 | | **1.35** | **1.7** | **0.318** | **0.0162** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **1.15** | **1.7** | **0.262** | **0.0151** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Sep-09 | FD | **1.14** | **1.5** | **0.236** | **0.0137** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | | **1.01** | **2.2** | **0.254** | **0.0151** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **1.28** | **1.4** | **0.270** | < 0.0250 | < 0.0250 | **10.8** | **< 0.0250** | **3.28** | | | < 0.0250 | |
| | | Mar-11 | | **1.17** | **2** | **0.319** | < 0.025 | < 0.025 | **11.2** | **< 0.025** | **4.32** | | | < 0.025 | |
| | | Sep-11 | | **1.04** | **0.68** | **0.252** | < 0.0250 | < 0.0250 | **11.3** | **< 0.0250** | **3.16** | | | < 0.0250 | |
| | OCD-7B | Apr-10 | | | < 0.050 | < 0.0100 | **0.0302** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | FD | | < 0.050 | < 0.0100 | **0.0319** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | < 0.05 | **0.074** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.638** | | | < 0.025 | |
| | OCD-8A | Apr-09 | | **1.07** | **0.93** | **0.105** | **0.0140** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.757** | **1.6** | **0.132** | **0.0165** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.826** | **1.2** | **0.110** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | **1.14** | **1.3** | **0.135** | < 0.0250 | < 0.0250 | **10.7** | **< 0.0250** | **3.89** | < 0.000200 | **0.0363** | < 0.0250 | < 0.0250 |
| | | Apr-11 | | **0.938** | **2.3** | **0.131** | < 0.025 | < 0.025 | **6.9** | **< 0.025** | **4.26** | < 0.0002 | **0.0271** | < 0.025 | < 0.025 |
| | | Apr-11 | FD | **0.928** | **2.2** | **0.13** | < 0.025 | < 0.025 | **6.54** | **< 0.025** | **4.2** | < 0.0002 | **0.0255** | < 0.025 | < 0.025 |
| | | Sep-11 | | **0.857** | **0.87** | **0.119** | < 0.0250 | < 0.0250 | **4.24** | **< 0.0250** | **3.17** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Group:** | | | | **TPH** | | **Total Metals** | | | | | | | | | |
| **Analyte:** | | | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| **Units:** | | | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| **CGWSL:** | | | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| **CGWSL Source:** | | | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | OCD-8B | Apr-10 | | | **0.35 J** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | < 0.05 | **0.64** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.452** | | | < 0.025 | |
| TMD | MW-8 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0141** | **0.0137** | | < 0.00080 | | < 0.000042 | | **0.0139** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | **0.0462** | | **< 0.0250** | | < 0.000200 | | **0.0280** | |
| | | Oct-10 | | < 0.0500 | < 0.050 | < 0.0100 | **0.0154** | **0.0521** | < 0.400 | < 0.0100 | **0.661** | | | **0.0278** | |
| | | Apr-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.778** | | | **0.0338** | |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.606** | | | **0.0449** | |
| | MW-16 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0188** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Apr-09 | FD | | < 0.050 | < 0.0100 | **0.0204** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | < 0.050 | **0.00711** | **0.0203** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | < 0.050 | < 0.0100 | **0.0164** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0808** | | | < 0.025 | |
| | | Apr-11 | FD | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.122** | | | < 0.025 | |
| | MW-20 | Apr-09 | | | < 0.020 | < 0.0100 | < 0.0100 | < 0.0012 | | < 0.00080 | | < 0.000042 | | **0.0157** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.105** | | | < 0.025 | |
| | MW-21 | Apr-09 | | | < 0.020 | < 0.0100 | < 0.0100 | < 0.0012 | | < 0.00080 | | < 0.000042 | | **0.0261** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | **0.0399** | |
| | | Oct-10 | | < 0.0500 | < 0.050 | < 0.0100 | < 0.0100 | < 0.0100 | < 0.400 | < 0.0100 | **0.790** | | | **0.0246 J** | |
| | | Apr-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.342** | | < 0.025 | **0.0344** | **0.038** |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **0.698** | | | **0.0907** | |
| | MW-25 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0103** | < 0.0100 | | < 0.00080 | | | | **0.0232** | |
| | | Sep-09 | | | < 0.050 | < 0.00500 | **0.0112** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | < 0.050 | < 0.0100 | **0.0139** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Mar-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.113** | | | < 0.025 | |
| | MW-26 | Apr-09 | | | < 0.020 | < 0.0100 | < 0.0100 | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0100 | |
| | | Sep-09 | | | < 0.050 | < 0.00500 | **0.00818** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00535** | |
| | | Apr-10 | | | **0.62** | < 0.0100 | < 0.0100 | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0587** | | | < 0.025 | |
| | MW-27 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0149** | < 0.0012 | | < 0.00080 | | < 0.000042 | | **0.0118** | |
| | | Sep-09 | | | < 0.050 | < 0.00500 | **0.0156** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.0135** | |
| | | Apr-10 | | | < 0.050 | < 0.0100 | **0.0158** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0116** | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | MW-68 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0122** | < 0.0012 | | < 0.00080 | | < 0.000042 | | **0.0163** | |
| | | Sep-09 | | | < 0.050 | **0.00566** | **0.0156** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.0379** | |
| | | Apr-10 | | | < 0.050 | < 0.0100 | **0.0127** | < 0.0100 | | < 0.0100 | | < 0.000200 | | **0.0127** | |
| | | Apr-11 | | | < 0.05 | **< 0.05** | < 0.05 | < 0.05 | **< 2** | **< 0.05** | < 0.05 | | | < 0.05 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| TMD (continued) | MW-71 | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | **0.0311** | |
| | | Oct-10 | | | < 0.050 | < 0.0100 | < 0.0100 | < 0.0100 | < 0.400 | < 0.0100 | < 0.0100 | < 0.000200 | < 0.0100 | **0.0330** | **0.0234** |
| | | Apr-11 | | | < 0.05 | **< 0.05** | < 0.05 | < 0.05 | **< 2** | **< 0.05** | < 0.05 | < 0.0002 | < 0.05 | < 0.05 | < 0.05 |
| | | Apr-11 | FD | | < 0.05 | **< 0.05** | < 0.05 | < 0.05 | **< 2** | **< 0.05** | < 0.05 | < 0.0002 | < 0.05 | < 0.05 | < 0.05 |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | < 0.000200 | < 0.0250 | **0.0473** | < 0.0250 |
| | MW-89 | Apr-09 | | | **0.14** | **0.0197** | **0.0131** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.084** | **0.0101** | **0.0157** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | FD | < 0.0500 | < 0.050 | **0.0149** | **0.0187** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-10 | | | < 0.050 | < 0.0100 | **0.0133** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Apr-11 | | | **0.19** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.947** | | | < 0.025 | |
| | NP-1 | Apr-09 | | | | | | | | | | | | | |
| | | Sep-09 | | | | | | | | | | | | | |
| | | Apr-10 | | | | | | | | | | | | | |
| | | Oct-10 | | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| | | Sep-11 | | | | | | | | | | | | | |
| | NP-6 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0101** | < 0.0012 | | < 0.00080 | | | | **0.0245** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Oct-10 | | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| N Refinery | MW-23 | Apr-09 | | | **17** | **0.0212** | **15.3** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **3.7** | **0.0182** | **4.59** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | **5.81** | **3.4** | **0.0152** | **6.82** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **38.3** | **5.1 J** | **< 0.0250** | **6.02** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0840** | | | < 0.0250 | |
| | | Apr-11 | | **30.7** | **2.5** | **< 0.025** | **8.84** | < 0.025 | < 1 | **0.0292** | **0.0937** | | | < 0.025 | |
| | | Sep-11 | | **36.1** | **2.6** | **< 0.0250** | **11.8** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0790** | | | < 0.0250 | |
| | MW-29 | Apr-09 | | | **0.53** | **0.0274** | **0.0173** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.48** | **0.00720** | **0.0222** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | **0.0784** | **0.22** | < 0.00500 | **0.0168** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.0693** | **0.38** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.350** | | | < 0.0250 | |
| | | Apr-11 | | **0.0694** | **0.27 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.419** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | **0.16** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.450** | | | < 0.0250 | |
| | MW-30 | Mar-10 | | < 0.0500 | **0.47** | **0.0126** | **0.0128** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | MW-40 | Mar-10 | | **0.974** | **1.2** | < 0.00500 | **0.0259** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | **0.483** | **0.47 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0813** | | | < 0.025 | |
| | | Apr-11 | FD | **0.478** | **0.54 J** | **< 0.025** | **0.025** | < 0.025 | < 1 | **< 0.025** | **0.0762** | | | < 0.025 | |
| | MW-41 | Apr-09 | | | **1.0** | **0.0181** | **0.0271** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **1.1** | **0.0138** | **0.0179** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | **0.417** | **0.92** | **0.0105** | **0.0188** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.744** | **0.97** | **< 0.0250** | **0.0323** | < 0.0250 | < 1.00 | **< 0.0250** | **0.876** | | | < 0.0250 | |
| | | Apr-11 | | **0.157** | **0.79 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **1.06** | | | < 0.025 | |
| | | Sep-11 | | **0.167** | **0.46** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.778** | | | < 0.0250 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| N Refinery (continued) | MW-42 | Apr-09 | | | **2.6** | **0.0150** | **0.0268** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Apr-09 | FD | | **2.2** | **0.0154** | **0.0256** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **1.3** | **0.0136** | **0.0224** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | **1.89** | **1.7** | **0.0122** | **0.0283** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **1.96** | **1.0** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.209** | | | < 0.0250 | |
| | | Apr-11 | | **2.64** | **0.94 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.246** | | | < 0.025 | |
| | MW-43 | Apr-09 | | | **5.7** | **0.0126** | **0.903** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **2.0** | **0.0119** | **0.213** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | **12.9** | **3.1** | **0.00998** | **0.489** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **15.7** | **1.2** | **< 0.0250** | **1.22** | < 0.0250 | < 1.00 | **< 0.0250** | **0.229** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Apr-11 | | **4.08** | **1.7** | **< 0.025** | **0.288** | < 0.025 | < 1 | **< 0.025** | **0.335** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **11.9** | **2.5** | **< 0.0250** | **1.61** | < 0.0250 | < 1.00 | **< 0.0250** | **0.241** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-45 | Apr-09 | | | **0.37** | < 0.0100 | **0.0147** | < 0.0100 | | < 0.0100 | | | | **0.0112** | |
| | | Sep-09 | | | **0.33** | < 0.00500 | **0.0146** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | | **0.29** | < 0.00500 | **0.0137** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Nov-10 | | | **0.38** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.390** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Nov-10 | FD | | **0.21** | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **0.450** | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | | **0.16** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.488** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.392** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Sep-11 | FD | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.399** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-46 | Nov-10 | | | < 0.050 | **< 0.0500** | **0.497** | **0.0593** | **39.4** | **< 0.0500** | **0.392** | | < 0.0500 | < 0.0500 | **0.189** |
| | MW-46R | Apr-11 | | | < 0.05 UJ | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0842** | | | < 0.025 | |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0914** | | | < 0.0250 | |
| | MW-55 | Apr-09 | | | < 0.050 | < 0.0100 | **0.0160** | < 0.0012 | | < 0.00080 | | < 0.000042 | | **0.0128** | |
| | | Sep-09 | | | **0.059** | **0.00525** | **0.00838** | < 0.00500 | < 0.200 | < 0.0100 | **0.0573** | < 0.000200 | | **0.0184** | |
| | | Mar-10 | | < 0.0500 | < 0.050 | < 0.00500 | **0.00913** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.0216** | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Apr-11 | | < 0.05 | < 0.05 U | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0328** | < 0.0002 | < 0.025 | **0.0273** | < 0.025 |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0355** | < 0.000200 | < 0.0250 | **0.0269** | < 0.0250 |
| | MW-56 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0142** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.073** | **0.00685** | **0.0136** | < 0.00500 | < 0.200 | < 0.00500 | **0.347** | < 0.000200 | | < 0.00500 | |
| | | Sep-09 | FD | | **0.067** | **0.00639** | **0.0135** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | | **0.23** | **0.00654** | **0.0122** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | | **0.089** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.304** | | | < 0.0250 | |
| | | Apr-11 | | | < 0.05 UJ | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.347** | | | < 0.025 | |
| | | Apr-11 | FD | | < 0.05 UJ | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.341** | | < 0.025 | < 0.025 | **0.0252** |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.282** | | | < 0.0250 | |
| | MW-59 | Apr-10 | | **0.0946** | < 0.050 | **0.0316** | **0.0127** | < 0.00500 | | < 0.0100 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | **0.167** | < 0.05 UJ | **0.0796** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.456** | | | < 0.025 | |
| | MW-60 | Apr-10 | | **0.917** | **0.35** | **0.0180** | **0.0193** | < 0.00500 | | < 0.0100 | | < 0.000200 | | < 0.00500 | |
| | | Nov-10 | | **0.962** | **0.27** | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **0.351** | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | **0.843** | **0.11 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.41** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **1.46** | **0.21** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.258** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| N Refinery (continued) | MW-61 | Apr-09 | | **16.2** | **3.2** | < 0.0100 | **0.0556** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **9.80** | **1.4** | | | | | | | | | | |
| | | Apr-10 | | **9.31** | **1.5** | < 0.0100 | **0.0327** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **11.3** | **1.4** | **< 0.0250** | **0.0294** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0264** | | | < 0.0250 | |
| | | Apr-11 | | **9.71** | **1.1** | **< 0.025** | **0.0261** | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **6.23** | **0.62** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0280** | | | < 0.0250 | |
| | MW-62 | Apr-09 | | **10.2** | **7.0** | **0.0192** | **0.445** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **6.61** | **1.2** | | | | | | | | | | |
| | | Apr-10 | | **3.91** | **1.2** | < 0.0100 | **0.876** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **4.44** | **0.65** | **< 0.0250** | **0.206 J** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Oct-10 | FD | **4.79** | **0.61** | < 0.00500 | **0.217 J** | < 0.00500 | < 0.200 | < 0.00500 | **0.00520** | | | < 0.00500 | |
| | | Apr-11 | | **3.94** | **1.1** | **< 0.025** | **0.514** | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **3.88** | **0.62** | **< 0.0250** | **0.417** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | MW-67 | Apr-09 | | | **2.7** | < 0.0100 | **0.165** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **0.368** | **0.67** | | | | | | | | | | |
| | | Mar-10 | | **0.402** | **1.0** | < 0.00500 | **0.154** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **1.22** | **1.3** | **< 0.0250** | **0.287** | < 0.0250 | < 1.00 | **< 0.0250** | **0.142** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-90 | Apr-09 | | **0.440** | **1.9** | < 0.0100 | **0.0218** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **0.244** | **2.0** | | | | | | | | | | |
| | | Mar-10 | | **0.274** | **1.9** | < 0.00500 | **0.0164** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.269** | **1.7** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0520** | | | < 0.0250 | |
| | | Apr-11 | | **0.245** | **1.2** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0644** | | | < 0.025 | |
| | | Sep-11 | | **0.281** | **0.42** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0736** | | | < 0.0250 | |
| | | Sep-11 | FD | **0.150** | **1.0** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0772** | | | < 0.0250 | |
| | MW-91 | Apr-09 | | **15.3** | **2.1** | < 0.0100 | **0.0934** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **27.5** | **2.6** | | | | | | | | | | |
| | | Mar-10 | | **21.9** | **1.2** | < 0.00500 | **0.0433** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **29.8** | **1.9** | **< 0.0250** | **0.0618** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **16.3** | **1.7** | **< 0.025** | **0.0726** | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **12.8** | **0.78** | **< 0.0250** | **0.203** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | MW-92 | Apr-09 | | **6.79** | **4.4** | < 0.0100 | **0.313** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **9.45** | **4.9** | | | | | | | | | | |
| | | Mar-10 | | **5.26** | **3.6** | < 0.00500 | **2.29** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | MW-93 | Apr-09 | | **10.4** | **1.2** | < 0.0100 | **0.123** | **0.0413** | | **0.0592** | | < 0.000200 | | < 0.0050 | |
| | | Oct-09 | | **5.08** | **1.9** | | | | | | | | | | |
| | | Mar-10 | | **31.8 J** | **1.5 J** | **0.00832** | **0.0433 J** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | FD | < 0.0500 UJ | **0.14 J** | **0.00826** | **0.0207** | < 0.00500 | | **0.00880** | | < 0.000200 | | **0.00508** | |
| | | Oct-10 | | **8.49** | **1.9** | **< 0.0250** | **0.0427** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **7.01** | **1.6** | **< 0.025** | **0.0546** | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **8.62** | **0.61** | **< 0.0250** | **0.0502** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0289** | | | < 0.0250 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| N Refinery (continued) | MW-95 | Apr-09 | | **0.273** | **1.6** | < 0.0100 | **0.0756** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **0.113** | **1.2** | | | | | | | | | | |
| | | Mar-10 | | **0.144** | **0.95** | < 0.00500 | **0.0905** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | **0.124** | **1.1** | **< 0.025** | **0.0882** | < 0.025 | < 1 | **< 0.025** | **0.161** | | | < 0.025 | |
| | MW-96 | Apr-09 | | **37.3** | **2.4** | < 0.0100 | **0.146** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Apr-09 | FD | **37.3** | **1.5** | < 0.0100 | **0.152** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | **35.2** | **1.6** | | | | | | | | | | |
| | | Oct-09 | FD | **38.0** | **1.8** | | | | | | | | | | |
| | | Mar-10 | | **25.8** | **1.6** | < 0.00500 | **0.0675** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **31.2** | **1.7** | **< 0.0250** | **0.0854** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **1.16** | **0.94** | **< 0.025** | **0.0668** | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **2.19** | **0.49** | **< 0.0250** | **0.0734** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | MW-98 | Apr-09 | | **22.9** | **2.5** | < 0.0100 | **0.0104** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **33.9** | **2.7** | < 0.00500 | **0.0136** | < 0.00500 | | **0.00946** | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **27.4** | **3.3** | < 0.0100 | **0.0142** | < 0.0100 | | **0.0108** | | < 0.000200 | | < 0.0100 | |
| | | Oct-10 | | **30.2** | **1.7** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **30.6** | **1.9 J** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **29.6** | **1.0** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | RW-1 | Apr-09 | | | | < 0.0100 | **0.0517** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | | | | | | | | | | | | |
| | | Nov-10 | | | **5.6** | **< 0.0500** | **0.0634** | < 0.0500 | **< 2.00** | **< 0.0500** | **0.172** | | < 0.0500 | < 0.0500 | < 0.0500 |
| | RW-2 | Nov-10 | | | **5.4** | **< 0.0250** | **3.10** | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | < 0.0250 | < 0.0250 | < 0.0250 |
| | RW-7 | Apr-10 | | **0.320** | **1.0 J** | < 0.00500 | **0.142** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | RW-9 | Apr-10 | | **0.926** | **0.44 J** | < 0.00500 | **0.0614** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | FD | **0.708** | **0.42 J** | < 0.00500 | **0.0598** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | | | | | | | | | | | | |
| | | Apr-11 | | **2.78** | **0.77** | **< 0.025** | **0.0734** | < 0.025 | < 1 | **< 0.025** | **0.299** | | | < 0.025 | |
| | RW-10 | Apr-10 | | < 0.0500 | **0.29** | < 0.00500 | **0.0214** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | < 0.05 | **0.27** | **< 0.025** | < 0.025 | < 0.025 | **4.14** | **< 0.025** | **0.206** | | | < 0.025 | |
| | | Apr-11 | FD | < 0.05 | **0.28** | **< 0.025** | < 0.025 | < 0.025 | **3.91** | **< 0.025** | **0.197** | | | < 0.025 | |
| | RW-16A | Mar-10 | | | **0.40** | **0.0157** | **0.0170** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.0127** | |
| S Refinery | KWB-2R | Oct-10 | | | **1.3** | **< 0.0500** | **0.733** | < 0.0500 | **< 2.00** | **< 0.0500** | **0.167** | | | < 0.0500 | |
| | | Apr-11 | | | **54** | **< 0.025** | **0.0517** | < 0.025 | **2.35** | **0.045** | **1.02** | | | < 0.025 | |
| | MW-28 | Apr-09 | | | **3.0** | < 0.0100 | **0.0321** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **1.6** | < 0.00500 | **0.0299** | < 0.00500 | | **0.00771** | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **5.42** | **3.5** | **0.00684** | **0.0365** | < 0.00500 | | **0.0194** | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **6.81 J** | **3.6 J** | **< 0.0250** | **0.0364** | < 0.0250 | < 1.00 | **< 0.0250** | **0.251** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Apr-11 | | **0.38** | **1.6** | **< 0.025** | **0.0538** | < 0.025 | < 1 | **< 0.025** | **0.366** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **0.239** | **2.0** | **< 0.0250** | **0.0527** | < 0.0250 | < 1.00 | **< 0.0250** | **0.291** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| S Refinery (continued) | MW-49 | Apr-09 | | **4.27** | **1.9** | < 0.0100 | **0.0486** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Apr-10 | | **3.72** | **0.74** | < 0.00500 | **0.0515** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **3.29** | **1.8** | **< 0.0250** | **0.0493** | < 0.0250 | < 1.00 | **< 0.0250** | **0.209** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Apr-11 | | **3.23** | **1 J** | **< 0.025** | **0.0558** | < 0.025 | < 1 | **< 0.025** | **0.241** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **3.03** | **0.83** | **< 0.0250** | **0.0415** | < 0.0250 | < 1.00 | **< 0.0250** | **0.218** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Sep-11 | FD | **2.72** | **0.75** | **< 0.0250** | **0.0415** | < 0.0250 | < 1.00 | **< 0.0250** | **0.209** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-50 | Apr-09 | | | **0.36** | < 0.0100 | **0.0208** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | | **0.12** | < 0.00500 | **0.0205** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Sep-09 | FD | | **0.12** | < 0.00500 | **0.0260** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | **0.13** | < 0.0100 | **0.0215** | < 0.0100 | | < 0.0100 | | < 0.000200 | | < 0.0100 UJ | |
| | | Nov-10 | | | **0.090** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **1.27** | | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **1.39** | | | < 0.025 | |
| | | Sep-11 | | | **0.078** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **1.19** | | | < 0.0250 | |
| | MW-52 | Apr-09 | | | **0.084** | < 0.0100 | **0.0106** | < 0.0012 | | < 0.00080 | | | | < 0.0050 | |
| | | Sep-09 | | | **0.080** | **0.00568** | **0.0109** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Sep-09 | FD | | **0.11** | **0.00588** | **0.0110** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | < 0.0500 | **0.057** | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **0.0764** | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | < 0.05 | **0.075** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0846** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **0.240 J** | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0717** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Sep-11 | FD | **0.105 J** | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.0685** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-57 | Nov-10 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **0.201** | | | **0.0542** | |
| | | Apr-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.926** | | | < 0.025 | |
| | | Sep-11 | | < 0.0500 | < 0.050 | **0.00565** | **0.0202** | < 0.00500 | < 0.200 | < 0.00500 | **0.103** | | | **0.0266** | |
| | MW-58 | Apr-09 | | | **0.68** | **0.0603** | **0.373** | < 0.0012 | | < 0.00080 | | | | < 0.0050 | |
| | | Sep-09 | | | **0.73** | **0.0139** | **0.612** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | **4.6** | **0.0423** | **1.27** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-10 | FD | | **5.6** | **0.0275** | **1.10** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | **0.49** | **< 0.0500** | **3.19** | < 0.0500 | **10.8** | **< 0.0500** | **0.364** | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | | **0.45** | **0.0843** | **0.371** | < 0.025 | **2.19** | **< 0.025** | **0.942** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | | **0.46** | **0.104** | **0.318** | < 0.0250 | **1.36** | **< 0.0250** | **0.898** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | MW-66 | Apr-09 | | **12.0** | **1.7** | < 0.0100 | **1.45** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **12.5** | **0.59** | < 0.00500 | **1.61** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **8.27** | **2.0** | < 0.00500 | **1.78** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **23.0** | **0.96** | **< 0.0250** | **2.78** | < 0.0250 | **2.50** | **< 0.0250** | **0.199** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Apr-11 | | **5.26** | **0.5** | **< 0.025** | **1.77** | < 0.025 | < 1 | **< 0.025** | **0.269** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Apr-11 | FD | **5.27** | **0.53** | **< 0.025** | **1.73** | < 0.025 | < 1 | **< 0.025** | **0.278** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | **3.76** | **0.37** | **< 0.0250** | **1.44** | < 0.0250 | < 1.00 | **< 0.0250** | **0.238** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| S Refinery (continued) | MW-99 | Apr-09 | | **2.04** | **0.70** | **0.0465** | **0.0811** | < 0.0012 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **29.2** | **0.59** | **0.0147** | **0.103** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **27.3** | **1.5** | **0.0138** | **0.239** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **22.6** | **0.83** | **< 0.0250** | **0.0800** | < 0.0250 | < 1.00 | **< 0.0250** | **0.288** | | | < 0.0250 | |
| | | Apr-11 | | **13.2** | **0.29** | **< 0.025** | **0.0838** | < 0.025 | < 1 | **< 0.025** | **0.275** | | | < 0.025 | |
| | | Sep-11 | | **19.1** | **0.34** | **< 0.0250** | **0.844** | < 0.0250 | **1.10** | **< 0.0250** | **0.201** | | | < 0.0250 | |
| | MW-101 | Apr-09 | | **24.4** | **0.83** | **0.0145** | **0.194** | < 0.0012 | | < 0.00080 | | < 0.000042 | | < 0.0050 | |
| | | Sep-09 | | **0.736** | **0.81** | **0.0595** | **0.0651** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **1.99** | **0.82** | **0.0246** | **0.104** | < 0.00500 | | < 0.0100 | | < 0.000200 | | < 0.00500 | |
| | | Nov-10 | | **1.45** | **1.1** | **0.0323** | **0.0814** | < 0.0250 | **1.56** | **< 0.0250** | **0.982** | | | < 0.0250 | |
| | | Apr-11 | | **3.26** | **0.83** | **< 0.025** | **0.0994** | < 0.025 | **1.03** | **< 0.025** | **1.04** | | | < 0.025 | |
| | | Sep-11 | | **1.42** | < 0.050 | **0.0600** | **0.0648** | < 0.0250 | **3.22** | **< 0.0250** | **1.05** | | | < 0.0250 | |
| | MW-103 | Mar-09 | | **9.54** | **3.9** | < 0.00500 | **0.494** | < 0.00500 | < 0.200 | < 0.00500 | **0.0191** | < 0.000042 | < 0.00500 | < 0.0022 | < 0.00500 |
| | | Sep-09 | | **5.15** | **1.6** | < 0.00500 | **0.561** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **4.47** | **3.4** | < 0.00500 | **0.614** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | **2.93** | **0.7** | **< 0.025** | **0.663** | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | MW-104 | Mar-09 | | **1.61** | **0.85** | < 0.00500 | **0.0280** | < 0.00500 | < 0.200 | < 0.0012 | **0.0177** | < 0.000042 | < 0.00500 | < 0.0022 | < 0.0014 |
| | | Sep-09 | | **1.08** | **0.50** | **0.00597** | **0.0400** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **0.714** | **0.38** | < 0.00500 | **0.0278** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **0.784** | **0.56** | **< 0.0250** | **0.0286** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0273** | | | < 0.0250 | |
| | | Oct-10 | FD | **0.812 J** | **0.47 J** | **< 0.0250** | **0.0322** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0283** | | | < 0.0250 | |
| | | Apr-11 | | **0.937** | **0.25** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0285** | | | < 0.025 | |
| | | Sep-11 | | **0.994 J** | **0.32** | **< 0.0250** | **0.0260** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0326** | | | < 0.0250 | |
| | | Sep-11 | FD | **1.09** | **0.48** | **< 0.0250** | **0.0250** | < 0.0250 | < 1.00 | **< 0.0250** | **0.0348** | | | < 0.0250 | |
| | MW-106 | Sep-09 | | **37.8** | **3.2** | **0.0112** | **0.0341** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | **22.7** | **0.81 J** | < 0.00500 | **0.0180** | < 0.00500 | | **0.00593** | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | **40.1** | **2.0** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | | Apr-11 | | **25.8** | **2.1** | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | < 0.025 | |
| | | Sep-11 | | **23.9** | **1.1** | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | | | < 0.0250 | |
| | MW-107 | Sep-09 | | **44.3** | **2.8** | **0.00555** | **1.45** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Mar-10 | | **28.7** | **3.1** | **0.00857** | **1.98** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Nov-10 | | **34.2** | **1.8** | **< 0.0250** | **2.46** | < 0.0250 | **10.8** | **< 0.0250** | **0.196** | | | < 0.0250 | |
| | | Apr-11 | | **21.9** | **2** | **< 0.025** | **2.11** | < 0.025 | **7.92** | **< 0.025** | **0.25** | | | < 0.025 | |
| | | Sep-11 | | **19.9** | **2.1 J** | **< 0.0250** | **1.63** | < 0.0250 | **6.06** | **< 0.0250** | **0.416** | | | < 0.0250 | |
| | MW-109 | Jan-11 | | **7.69** | **1.4** | **0.016** | **0.154 J** | **0.00356 J** | | **0.00128 J** | | < 0.0002 | | < 0.005 | |
| | | Jan-11 | FD | **5.44** | **1** | **0.0206** | **0.247 J** | **0.00794** | | **0.00289 J** | | < 0.0002 | | < 0.005 | |
| | | Apr-11 | | **5.23** | **2.2** | **0.0309** | **0.103** | < 0.025 | **2.1** | **< 0.025** | **0.776** | | | < 0.025 | |
| | | Sep-11 | | **1.64** | **0.18** | **0.0256** | **0.140** | < 0.0250 | **1.08** | **< 0.0250** | **0.457** | | | < 0.0250 | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Analyte Group:** | **TPH** | | **Total Metals** | | | | | | | | | |
| | | | **Analyte:** | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | | **Units:** | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | | **CGWSL:** | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | | **CGWSL Source:** | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| S Refinery (continued) | MW-110 | Jan-11 | | **10.2** | **2.4** | **0.0119** | **0.166** | < 0.005 | | < 0.005 | | < 0.0002 | | < 0.005 | |
| | | Apr-11 | | **5.9** | **4.9** | **< 0.025** | **0.201** | < 0.025 | **3.65** | **< 0.025** | **2.33** | | | < 0.025 | |
| | | Sep-11 | | **1.13** | **0.18** | **0.0315** | **0.0830** | < 0.0250 | **1.33** | **< 0.0250** | **2.51** | | | < 0.0250 | |
| | RW-4 | Apr-10 | | | **1.0** | **0.0283** | **0.193** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-11 | | | **1.3** | **< 0.025** | **0.194** | < 0.025 | < 1 | **< 0.025** | **0.169** | | | < 0.025 | |
| | RA-313 | Oct-09 | | | | | | | | | | | | | |
| | | Apr-10 | | | | | | | | | | | | | |
| | | Apr-10 | FD | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| | RA-1227 | Nov-10 | | | | | | | | | | | | | |
| | | Nov-10 | FD | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| Field E of Refinery | KWB-1A | Apr-09 | | | < 0.020 | < 0.0100 | < 0.0100 | < 0.0012 | | < 0.00080 | | | | < 0.0050 | |
| | | Sep-09 | | | < 0.050 | **0.00709** | **0.00975** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | **0.0101** | < 0.0250 | | < 0.0100 | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | < 0.050 | < 0.00500 | **0.00887** | < 0.00500 | < 0.200 | < 0.00500 | **0.234** | < 0.000200 | **0.0114** | < 0.00500 | **0.0166** |
| | | Oct-10 | FD | | < 0.050 | < 0.00500 | **0.00979** | < 0.00500 | < 0.200 | < 0.00500 | **0.251** | < 0.000200 | **0.0110** | < 0.00500 | **0.0181** |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.275** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | **0.251** | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | KWB-3AR | Apr-09 | | | < 0.020 | < 0.0100 | **0.0242** | < 0.0100 | | < 0.0100 | | < 0.000042 | | **0.0146** | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | **0.0236** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | **0.0282** | |
| | | Oct-10 | | | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Oct-10 | FD | | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | **0.0272** | < 0.025 |
| | KWB-7 | Apr-09 | | | < 0.050 | < 0.0100 | **0.0343** | < 0.0012 | | < 0.00080 | | | | **0.0135** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | **0.0302** | < 0.0250 | | < 0.0100 | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | **2.34** | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | | **0.052** | **< 0.05** | < 0.05 | < 0.05 | **< 2** | **< 0.05** | **1.54** | < 0.0002 | < 0.05 | < 0.05 | < 0.05 |
| | | Sep-11 | | | < 0.050 | **< 0.0250** | **0.0395** | < 0.0250 | < 1.00 | **< 0.0250** | **2.19** | < 0.000200 | **0.0274** | < 0.0250 | < 0.0250 |
| | KWB-9 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0109** | < 0.0012 | | < 0.0100 | | | | < 0.0050 | |
| | | Sep-09 | | | < 0.050 | < 0.00500 | **0.0113** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00640** | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | **0.0282** | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | KWB-11A | Apr-09 | | | < 0.020 | < 0.0100 | **0.0215** | < 0.0100 | | < 0.00080 | | | | **0.0255** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | < 0.00500 | **0.0203** | < 0.00500 | < 0.200 | < 0.0100 | < 0.00500 | < 0.000200 | **0.00707** | **0.00897** | **0.0128** |
| | | Apr-11 | | < 0.05 | < 0.05 UJ | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Sep-11 | FD | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| Field E of Refinery (continued) | KWB-11B | Oct-10 | | < 0.0500 | < 0.050 | < 0.00500 | **0.0172** | < 0.00500 | < 0.200 | < 0.00500 | < 0.00500 | < 0.000200 | **0.00639** | **0.00981** | **0.00751** |
| | | Apr-11 | | < 0.05 | < 0.05 UJ | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | **0.0323** | < 0.025 |
| | | Sep-11 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | KWB-12A | Sep-09 | | | < 0.050 | < 0.00500 | **0.0173** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Sep-11 | | < 0.0500 | < 0.050 | < 0.00500 | **0.0140** | < 0.00500 | < 0.200 | < 0.00500 | < 0.00500 | < 0.000200 | < 0.00500 | < 0.00500 | **0.0101** |
| | KWB-12B | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Apr-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Sep-11 | | < 0.0500 | < 0.050 | < 0.00500 | **0.00821** | < 0.00500 | < 0.200 | < 0.00500 | < 0.00500 | < 0.000200 | < 0.00500 | < 0.00500 | **0.0108** |
| | | Sep-11 | FD | < 0.0500 | < 0.050 | < 0.00500 | **0.00809** | < 0.00500 | < 0.200 | < 0.00500 | < 0.00500 | < 0.000200 | < 0.00500 | < 0.00500 | **0.0111** |
| | RW-11-1 | Nov-10 | | | **3.5** | **< 0.0250** | **0.106** | < 0.0250 | **9.62** | **< 0.0250** | **0.812** | | < 0.0250 | < 0.0250 | < 0.0250 |
| | RW-18 | Apr-09 | | | | < 0.0100 | **0.0108** | < 0.0012 | | < 0.00080 | | | | **0.0115** | |
| | | Sep-09 | | | | **0.00602** | **0.0109** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00894** | |
| | | Apr-10 | | | | **< 0.0250** | **0.0102** | < 0.0250 | | < 0.0100 | | < 0.000200 | | < 0.0250 | |
| | RA-4196 | Apr-09 | | | | | | | | | | < 0.000042 | | | |
| | | Sep-09 | | | | < 0.00500 | **0.0138** | < 0.00500 | | < 0.00500 | | < 0.000200 | | < 0.00500 | |
| | | Apr-10 | | | | | | | | | | | | | |
| | | Nov-10 | | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| | | Apr-11 | FD | | | | | | | | | | | | |
| | | Sep-11 | | | | | | | | | | | | | |
| | | Sep-11 | FD | | | | | | | | | | | | |
| | RA-4798 | Apr-09 | | | | | | | | | | < 0.000042 | | | |
| | | Sep-09 | | | | < 0.00500 | **0.0109** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.00815** | |
| | | Apr-10 | | | | | | | | | | | | | |
| | | Nov-10 | | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| | | Sep-11 | | | | | | | | | | | | | |
| Crossgradient | KWB-13 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0186** | < 0.0100 | | < 0.0100 | | < 0.000042 | | **0.0181** | |
| | | Apr-09 | FD | | < 0.020 | < 0.0100 | **0.0202** | < 0.0100 | | < 0.0100 | | < 0.000042 | | **0.0203** | |
| | | Sep-09 | | | < 0.050 | < 0.00500 | **0.0183** | < 0.00500 | | < 0.00500 | | < 0.000200 | | **0.0169** | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | **0.0290** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | **0.0297** | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | NP-5 | Apr-09 | | | < 0.020 | < 0.0100 | < 0.0100 | < 0.0012 | | < 0.0100 | | | | **0.0435** | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | **0.0412** | |
| | | Apr-11 | | | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | | | **0.0258** | |
| | RA-3156 | Apr-09 | | | | | | | | | | < 0.000042 | | | |
| | | Apr-10 | | | | | | | | | | | | | |
| | | Nov-10 | | | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | | | |
| | | Sep-11 | | | | | | | | | | | | | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | TPH | | Total Metals | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | GRO | DRO | Arsenic | Barium | Chromium | Iron | Lead | Manganese | Mercury | Nickel | Selenium | Vanadium |
| | | Units: | | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | | CGWSL: | | | 0.2 | 0.01 | 1 | 0.05 | 1 | 0.015 | 0.2 | 0.002 | 0.2 | 0.05 | 0.183 |
| | | CGWSL Source: | | | NMED TPH | EPA MCL | WQCC HH | WQCC HH | WQCC Dom | EPA MCL | WQCC Dom | EPA MCL | WQCC Irr | EPA MCL | NMED TW |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| Upgradient | MW-53 | Apr-09 | | | < 0.020 | < 0.0100 | **0.0347** | < 0.0012 | | < 0.00080 | | | | < 0.0050 | |
| | | Oct-09 | | | < 0.050 | | | | | | | | | | |
| | | Apr-10 | | | < 0.050 | **< 0.0250** | **0.0280** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-10 | FD | | < 0.050 | **< 0.0250** | **0.0261** | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Apr-11 | | | **0.24** | **< 0.025** | **0.0311** | < 0.025 | < 1 | **< 0.025** | **1.59** | | | < 0.025 | |
| | UG-1 | Apr-09 | | | | < 0.0100 | **0.473** | **0.0315** | | **0.0404** | | < 0.000042 | | **0.0126** | |
| | | Oct-09 | | | | | | | | | | | | | |
| | | Apr-10 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | UG-2 | Apr-09 | | | | < 0.0100 | **0.115** | < 0.0100 | | < 0.0100 | | < 0.000042 | | < 0.0050 | |
| | | Oct-09 | | | | | | | | | | | | | |
| | | Apr-10 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0500** | < 0.0500 | < 0.0500 | **< 2.00** | **< 0.0500** | < 0.0500 | < 0.000200 | < 0.0500 | < 0.0500 | < 0.0500 |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | UG-3R | Apr-09 | | | | < 0.0100 | **0.0613** | < 0.0100 | | < 0.0100 | | **0.000309** | | < 0.0050 | |
| | | Oct-09 | | | | | | | | | | | | | |
| | | Apr-10 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | | **< 0.0250** | | < 0.000200 | | < 0.0250 | |
| | | Oct-10 | | < 0.0500 | < 0.050 | **< 0.0250** | < 0.0250 | < 0.0250 | < 1.00 | **< 0.0250** | < 0.0250 | < 0.000200 | < 0.0250 | < 0.0250 | < 0.0250 |
| | | Mar-11 | | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |
| | | Mar-11 | FD | < 0.05 | < 0.05 | **< 0.025** | < 0.025 | < 0.025 | < 1 | **< 0.025** | < 0.025 | < 0.0002 | < 0.025 | < 0.025 | < 0.025 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | | |
| NCL | MW-18 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-54A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-54B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-108 | Oct-09 | | **75** | **480** | < 5.0 | < 5.0 | **96** | < 5.0 | **98** | < 5.0 J | < 5.0 | **11** | **110** | < 5.0 |
| | | Mar-10 | | **34** | **330** | < 5.0 | < 5.0 | **24** | < 5.0 | < 5.0 | **6.9** | < 5.0 | < 5.0 | **29** | < 5.0 |
| | | Apr-10 | | **41** | **400** | < 5.0 | < 5.0 | **11** | < 5.0 | **27** | < 5.0 | < 5.0 UJ | **7.6** | **58** | < 5.0 |
| | | Oct-10 | | **38** | **460** | < 5.0 | < 5.0 | **7.9** | < 5.0 | < 5.0 | **5.6** | < 5.0 | **6.9** | **51** | < 5.0 |
| | | Apr-11 | | **41** | **530** | < 5 | < 5 | **5.2** | < 5 | **5.8** | < 5 | < 5 | **7.7** | **53** | < 5 |
| | | Apr-11 | FD | **39** | **470** | < 5 | < 5 | **5.1** | < 5 | **6.1** | < 5 | < 5 | **7.4** | **49** | < 5 |
| | | Sep-11 | | **27** | **300** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.9** | < 5.0 | < 5.0 | **5.7** | **37** | < 5.0 |
| | NCL-31 | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **8.5** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **8.7 J** | < 5.0 UJ | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **5.4** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | NCL-32 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | NCL-33 | Apr-09 | | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 J | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | NCL-34 | Apr-09 | | **120** | **2500** | < 0.50 | < 0.50 | **170** | < 0.50 | **25** | < 0.50 | < 0.60 | < 5.0 | **260** | < 0.50 |
| | | Sep-09 | | **96** | **1800** | < 5.0 | < 5.0 | **11** | < 5.0 | **7.1** | < 5.0 | < 5.0 | < 5.0 | **220** | < 5.0 |
| | | Mar-10 | | **37** | **340** | < 5.0 | < 5.0 | **5.6 J** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **65 J** | < 5.0 |
| | | Mar-10 | FD | **37** | **330** | < 5.0 | < 5.0 | **23 J** | < 5.0 | < 5.0 | **6.0** | < 5.0 | < 5.0 | **25 J** | < 5.0 |
| | | Oct-10 | | **76** | **1600** | < 5.0 | < 5.0 | **12** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **150** | < 5.0 |
| | | Oct-10 | FD | **76** | **1400** | < 5.0 | < 5.0 | **11** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **150** | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| NCL (continued) | NCL-44 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 J | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | NCL-49 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-09 | FD | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | RW-17A | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| TEL | TEL-1 | Apr-09 | | < 5.0 | < 5.0 | < 0.50 | < 0.50 | < 5.0 | **7.0** | < 5.0 J | **6.5** | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Apr-09 | FD | < 5.0 | < 5.0 | < 0.50 | < 0.50 | < 5.0 | **7.2** | < 5.0 J | **6.2** | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.3** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.3** | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **6.2** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **6.2** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | TEL-2 | Apr-09 | | **150** | **1200** | < 0.50 | < 0.50 | **12** | **17** | **27** | **12** | < 0.60 | **43** | **200** | < 0.50 |
| | | Sep-09 | | **160** | **1100** | < 5.0 | < 5.0 | **9.4** | **17** | **28** | **13** | < 5.0 | **56** | **240** | < 5.0 |
| | | Apr-10 | | **180** | **1500** | < 5.0 | < 5.0 | **15** | **7.5** | **52** | **18** | < 5.0 | **75** | **250** | < 5.0 |
| | | Oct-10 | | **46** | **910** | < 25 | < 25 | < 25 | < 25 | < 25 | < 25 | **< 25** | **26** | **160** | **< 25** |
| | | Apr-11 | | **140** | **1200** | < 5 | < 5 | **12** | **10** | **23** | **15** | < 5 | **39** | **220** | < 5 |
| | | Sep-11 | | **160** | **1100** | < 5.0 | < 5.0 | **8.9** | **8.4** | **14** | **12** | < 5.0 | **27** | **210** | < 5.0 |
| | TEL-3 | Apr-09 | | **48** | **540** | < 0.50 | < 0.50 | < 5.0 | **41** | < 5.0 J | < 5.0 | < 0.60 | **6.0** | **30** | < 0.50 |
| | | Sep-09 | | **37** | **44** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 J | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | **25** | **35** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | **28** | **41** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | **5.3** | **30** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | **22** | **29** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | **19** | < 5 |
| | | Sep-11 | | **20** | **33** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | TEL-4 | Apr-09 | | < 0.50 | **38** | < 0.50 | < 0.50 | **24** | **210** | < 5.0 | < 5.0 | < 0.60 | < 5.0 | **42** | < 0.50 |
| | | Sep-09 | | **91** | **12** | < 5.0 | < 5.0 | **13** | **200** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **28** | < 5.0 |
| | | Apr-10 | | **93** | **7.2** | < 5.0 | < 5.0 | **7.6** | **180** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **30** | < 5.0 |
| | | Oct-10 | | **51** | **10** | < 5.0 | < 5.0 | < 5.0 | **160** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **20** | < 5.0 |
| | | Apr-11 | | **45** | **27** | < 5 | < 5 | < 5 | **200** | < 5 | < 5 | < 5 | < 5 | **19** | < 5 |
| | | Sep-11 | | **82** | **150** | < 5.0 | < 5.0 | < 5.0 | **150** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **48** | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Analyte Group:** | | **Volatile Organic Compounds** | | | | | | | | | |
| | | **Analyte:** | | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | **Units:** | | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | **CGWSL:** | | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | **CGWSL Source:** | | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP | MW-1R | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-2A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **7.1** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-2B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-3 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 J | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-4A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 5.0 | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **16** | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | | | | | | | | | | | | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-4B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-5A | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.2** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.9** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | **7.3** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-5B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-6A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | **5.0** | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.2** | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | | |
| EP (continued) | MW-6B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-7A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-7B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-10 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Jun-10 | | | | | | | | | | | | | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-11A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-11B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-15 | Apr-09 | | < 5.0 | **9.1** | < 0.50 | < 0.50 | **14** | < 0.50 | < 0.50 | < 5.0 | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | **8.4** | < 5.0 | < 5.0 | **5.1** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | **20** | < 5 | < 5 | **8.6** | < 5 | < 5 | < 5 | < 5 | **7.9** | **19** | < 5 |
| | MW-18A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Jun-10 | | | | | | | | | | | | | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-18B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-22A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **5.5** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.9** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.5** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.9** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **8.2** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **7.4** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.7** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-22B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **9.1** | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-70 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Jun-10 | | | | | | | | | | | | | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-72 | Mar-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-73 | Mar-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **5.5** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-74 | Mar-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-75 | Mar-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **5.8** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **9.3** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **10** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.0** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **5.4** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-76 | Mar-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **5.9** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **11** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.3** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.0** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-77 | Mar-09 | | < 5.0 | **12** | < 0.50 | < 0.50 | < 5.0 | **12** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | **32** | < 5.0 | < 5.0 | < 5.0 | **10** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | **20** | < 5.0 | < 5.0 | < 5.0 | **9.7** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | **11** | < 5.0 | < 5.0 | < 5.0 | **9.8** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **7.3** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Mar-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | **7.1** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **24** | < 5.0 | < 5.0 | < 5.0 | **15** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-78 | Mar-09 | | < 5.0 | **6.7** | < 0.50 | < 0.50 | < 5.0 | < 5.0 | < 0.50 | < 5.0 | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Sep-09 | | **5.0** | **13** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Jun-10 | | | | | | | | | | | | | |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-79 | Mar-09 | FD | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Mar-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-80 | Mar-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-81 | Mar-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-82 | Mar-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-83 | Mar-09 | | **6.2** | **5.5** | < 0.50 | < 0.50 | **6.3** | < 5.0 | < 0.50 | < 5.0 | < 0.60 | < 5.0 | **44** | < 0.50 |
| | | Sep-09 | | < 5.0 | **5.3** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Jun-10 | | | | | | | | | | | | | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | **5.2** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-84 | Mar-09 | | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 10 | < 1.0 | < 1.0 | < 1.2 | < 1.0 | < 2.0 | < 1.0 |
| | | Sep-09 | | < 10 | **< 10** | < 10 | < 10 | < 10 | **12** | < 10 | < 10 | **< 10** | < 10 | < 30 | **< 10** |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.1** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **7.7** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **8.6** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-87 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-88 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-09 | FD | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-1R | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-2A | Mar-09 | FD | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Mar-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | OCD-2B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-3 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-4 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-5 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-6 | Apr-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-7A | Apr-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.0** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | OCD-7B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | OCD-8A | Apr-09 | | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **9.0** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **8.4** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.5** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **7.9** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **7.1** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | **7.5** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.4** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| EP (continued) | OCD-8B | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| TMD | MW-8 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.6** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.7** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-16 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-09 | FD | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-20 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-21 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **12** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **8.3** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.2** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-25 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-26 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-27 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-68 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | | |
| TMD (continued) | MW-71 | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-89 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | NP-1 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **150** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **130** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **150** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **100** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **160** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **82** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | NP-6 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| N Refinery | MW-23 | Apr-09 | | **580** | **15000** | < 0.50 | < 0.50 | **1900** | **27** | **370** | < 120 | < 0.60 | **600** | **1700** | < 0.50 |
| | | Sep-09 | | **110** | **7700** | < 5.0 | < 5.0 | **140** | **7.0** | **99** | < 5.0 | < 5.0 | **5.2** | **310** | < 5.0 |
| | | Mar-10 | | **150** | **15000** | < 5.0 | < 5.0 | **1100** | **8.1** | **200** | < 120 | < 5.0 | **9.7** | **500** | < 5.0 |
| | | Oct-10 | | **190** | **14000** | < 5.0 | < 5.0 | **1200** | **8.0** | **190** | < 5.0 | < 5.0 | **9.4** | **< 1500** | < 5.0 |
| | | Apr-11 | | **120** | **11000** | < 25 | < 25 | **950** | < 25 | **160** | < 25 | **< 25** | < 25 | **400** | **< 25** |
| | | Sep-11 | | **65** | **17000** | < 50 | < 50 | **520** | < 50 | **180** | < 50 | **< 50** | < 50 | **280** | **< 50** |
| | MW-29 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-30 | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-40 | Mar-10 | | < 5.0 | **55** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-41 | Apr-09 | | < 5.0 | **23** | < 0.50 | < 0.50 | < 0.50 | **60** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | **35** | < 5.0 | < 5.0 | < 5.0 | **24** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | **75** | < 5.0 | < 5.0 | < 5.0 | **10** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | **210** | < 5.0 | < 5.0 | < 5.0 | **39** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | **13** | < 5 | < 5 | < 5 | **29** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **49** | < 5.0 | < 5.0 | < 5.0 | **12** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| N Refinery (continued) | MW-42 | Apr-09 | | **250** | **1600** | < 0.50 | < 0.50 | **27** | **28** | **40** | < 12 | < 0.60 | **5.7** | **420** | < 0.50 |
| | | Apr-09 | FD | **270** | **1700** | < 0.50 | < 0.50 | **26** | **24** | **41** | < 12 | < 0.60 | **5.6** | **450** | < 0.50 |
| | | Sep-09 | | **56** | **560** | < 5.0 | < 5.0 | < 5.0 | **31** | < 5.0 J | < 5.0 | < 5.0 | < 5.0 | **98** | < 5.0 |
| | | Mar-10 | | **54** | **660** | < 5.0 | < 5.0 | < 5.0 | **27** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **120** | < 5.0 |
| | | Oct-10 | | **37** | **610** | < 5.0 | < 5.0 | < 5.0 | **26** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **80** | < 5.0 |
| | | Apr-11 | | **80** | **770** | < 5 | < 5 | < 5 | **34** | **7** | < 5 | < 5 | < 5 | **130** | < 5 |
| | MW-43 | Apr-09 | | **200** | **4900** | < 0.50 | < 0.50 | **510** | < 0.50 | **84** | < 120 | < 0.60 | **140** | **720** | < 0.50 |
| | | Sep-09 | | **81** | **810** | < 5.0 | < 5.0 | **24** | **8.7** | < 5.0 J | **25** | < 5.0 | **50** | **220** | < 5.0 |
| | | Mar-10 | | **120** | **4700 J** | < 5.0 | < 5.0 | **200** | **6.1** | **35** | < 120 | < 5.0 UJ | **120** | **460** | < 5.0 |
| | | Oct-10 | | **89** | **5800** | < 50 | < 50 | **59** | < 50 | **< 50** | < 50 | **< 50** | **99** | **460** | **< 50** |
| | | Apr-11 | | **56** | **890** | < 5 | < 5 | **13** | < 5 | < 5 | **19** | < 5 | **41** | **190** | < 5 |
| | | Sep-11 | | **68** | **4400** | < 5.0 | < 5.0 | **83** | **8.1** | **14** | **27** | < 5.0 | **130** | **340** | < 5.0 |
| | MW-45 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 5.0 | < 0.60 | < 0.50 | < 15 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-46 | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-46R | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-55 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-56 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-59 | Apr-10 | | < 5.0 | **8.0** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | **28** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-60 | Apr-10 | | **5.0** | **170** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | | **9.8** | **220** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **20** | < 5.0 |
| | | Apr-11 | | < 5 | **160** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | **22** | < 5 |
| | | Sep-11 | | **8.5** | **280** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.1** | **33** | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| N Refinery (continued) | MW-61 | Apr-09 | | **320** | **3600** | < 0.50 | < 0.50 | **79** | < 0.50 | **170** | < 12 | < 0.60 | **210** | **820** | < 0.50 |
| | | Oct-09 | | **180** | **2400** | **6.0** | < 5.0 | **46** | < 5.0 | **130** | < 120 | < 5.0 | **150** | **460** | < 5.0 |
| | | Apr-10 | | **200** | **2200** | **290** | < 5.0 | **64** | < 5.0 | **150** | < 120 | < 5.0 | **150** | **550** | < 5.0 |
| | | Oct-10 | | **230** | **2000** | **200** | < 5.0 | **85** | < 5.0 | **160** | < 120 | < 5.0 | **140** | **560** | < 5.0 |
| | | Apr-11 | | **290** | **1900** | **280** | < 5 | **83** | < 5 | **180** | < 50 | < 5 | **140** | **570** | < 5 |
| | | Sep-11 | | **190** | **1100** | **190** | < 5.0 | **52** | < 5.0 | **150** | < 5.0 | < 5.0 | **62** | **350** | < 5.0 |
| | MW-62 | Apr-09 | | **140** | **3500** | < 0.50 | < 0.50 | **44** | **17** | **65** | < 5.0 | < 0.60 | < 5.0 | **320** | < 0.50 |
| | | Oct-09 | | **80** | **2900** | < 5.0 | < 5.0 | **32** | **19** | **32** | < 5.0 | < 5.0 | < 5.0 | **240** | < 5.0 |
| | | Apr-10 | | **52** | **1500 J** | < 5.0 | < 5.0 | **39** | **36** | **14** | < 5.0 | < 5.0 | < 5.0 | **170** | < 5.0 |
| | | Oct-10 | | **14 J** | **560 J** | < 5.0 | < 5.0 | **34** | **23** | **23** | < 5.0 | < 5.0 | < 5.0 | **260** | < 5.0 |
| | | Oct-10 | FD | **85 J** | **1400 J** | < 5.0 | < 5.0 | **33** | **21** | **25** | < 5.0 | < 5.0 | < 5.0 | **250** | < 5.0 |
| | | Apr-11 | | **67** | **1000** | < 5 | < 5 | **18** | **26** | **13** | < 5 | < 5 | < 5 | **180** | < 5 |
| | | Sep-11 | | **170** | **730** | < 5.0 | < 5.0 | **98** | **22** | **51** | < 5.0 | < 5.0 | < 5.0 | **330** | < 5.0 |
| | MW-67 | Apr-09 | | < 0.50 | **78** | < 0.50 | < 5.0 J | < 5.0 | **150** | < 5.0 J | < 0.50 | < 5.0 | < 0.50 | < 15 | **17** |
| | | Oct-09 | | < 5.0 | **45** | < 5.0 | < 5.0 J | < 5.0 | **110** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | **5.0** |
| | | Mar-10 | | < 5.0 | **86** | < 5.0 | < 5.0 | < 5.0 | **86** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | **6.3** |
| | | Oct-10 | | < 5.0 | **160** | < 5.0 | < 5.0 | < 5.0 | **580** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-90 | Apr-09 | | < 0.50 | **20** | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 5.0 | < 5.0 | < 0.60 | < 5.0 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | **14** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | **11** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | **14** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | **6.4** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **5.9** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | **6.2** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-91 | Apr-09 | | **140** | **1900** | < 0.50 | < 0.50 | **1100** | < 0.50 | **43** | **190** | < 0.60 | **2200** | **1100** | < 0.50 |
| | | Oct-09 | | **150** | **3900** | < 5.0 | < 5.0 | **1500** | < 5.0 | **57** | **380** | < 5.0 | **4800** | **1800** | < 5.0 |
| | | Mar-10 | | **170** | **3500** | < 5.0 | < 5.0 | **1500** | < 5.0 | **47** | **310** | < 5.0 | **3900** | **1900** | < 5.0 |
| | | Oct-10 | | **140** | **4800** | < 5.0 | < 5.0 | **1900** | < 5.0 | **58** | **440** | < 5.0 | **6000** | **2400** | < 5.0 |
| | | Apr-11 | | **170** | **2800** | < 5 | < 5 | **1200** | < 5 | **55** | < 120 | < 5 | **250** | **1300** | < 5 |
| | | Sep-11 | | **130** | **2500** | < 5.0 | < 5.0 | **780** | < 5.0 | **44** | < 120 | < 5.0 | **620** | **790** | < 5.0 |
| | MW-92 | Apr-09 | | **6.6** | **1800** | < 0.50 | **28** | **220** | **68** | **90** | **6.2** | **7.9** | **16** | **57** | **20** |
| | | Oct-09 | | < 5.0 | **3600** | < 5.0 | **94** | **260** | **260** | **110** | **5.3** | < 5.0 | **18** | **40** | < 5.0 |
| | | Mar-10 | | < 5.0 | **2200** | < 5.0 | **60** | **160** | **130** | **34** | < 5.0 | < 5.0 | **13** | **34** | < 5.0 |
| | MW-93 | Apr-09 | | **300** | **2700** | < 0.50 | < 0.50 | **40** | < 5.0 J | **110** | < 12 | < 0.60 | **12** | **790** | < 5.0 |
| | | Oct-09 | | **190** | **1300** | < 5.0 | < 5.0 | **13** | < 5.0 | **64** | < 120 | < 5.0 | **5.3** | **380 J** | < 5.0 |
| | | Mar-10 | | **180** | **1500 J** | < 5.0 | < 5.0 | **20 J** | < 5.0 | **71 J** | < 100 | < 5.0 | **7.1** | **480** | < 5.0 |
| | | Mar-10 | FD | < 5.0 | < 5.0 UJ | < 5.0 | < 5.0 | < 5.0 UJ | < 5.0 | < 5.0 UJ | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | **320** | **2700** | < 5.0 | < 5.0 | **42** | < 5.0 | **100** | < 120 | < 5.0 | **11** | **870** | < 5.0 |
| | | Apr-11 | | **220** | **1800** | < 5 | < 5 | **40** | < 5 | **89** | < 50 | < 5 | **10** | **560** | < 5 |
| | | Sep-11 | | **240** | **2500** | < 5.0 | < 5.0 | **58** | < 5.0 | **120** | < 50 | < 5.0 | **15** | **550** | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| N Refinery (continued) | MW-95 | Apr-09 | | < 5.0 | **23** | < 0.50 | < 0.50 | < 5.0 | < 0.50 | < 5.0 J | < 0.50 | < 0.60 | < 5.0 | < 15 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-10 | | < 5.0 | **16** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | MW-96 | Apr-09 | | < 5.0 | **6.8** | < 0.50 | < 0.50 | **6.1** | **63000** | < 5.0 | < 5.0 | < 0.60 | < 5.0 | **24** | < 0.50 |
| | | Apr-09 | FD | < 5.0 | **8.3** | < 0.50 | < 0.50 | **5.9** | **64000** | < 5.0 | < 5.0 | < 0.60 | < 5.0 | **22** | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **53000** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| | | Oct-09 | FD | < 5.0 | **5.1** | < 5.0 | < 5.0 | < 5.0 | **53000** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 |
| | | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **33000** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **30000** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **26000** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | **< 120** | **< 120** | **< 120** | **< 120** | < 120 | **41000** | **< 120** | < 120 | **< 120** | < 120 | < 380 | **< 120** |
| | MW-98 | Apr-09 | | **160** | **7100** | < 0.50 | < 0.50 | **590** | < 0.50 | **93** | < 120 | < 0.60 | **180** | **700** | < 0.50 |
| | | Sep-09 | | **320** | **7700** | < 5.0 | < 5.0 | **1200** | < 5.0 | **170** | **< 250 J** | < 5.0 | **210** | **1300** | < 5.0 |
| | | Apr-10 | | **320** | **9500** | < 5.0 | < 5.0 | **1300** | < 5.0 | **140** | **< 250** | < 5.0 | **230** | **1600** | < 5.0 |
| | | Oct-10 | | **140** | **7600** | < 25 | < 25 | **770** | < 25 | **160** | < 25 | **< 25** | **190** | **1300** | **< 25** |
| | | Apr-11 | | **580** | **12000** | < 5 | < 5 | **1600** | < 5 | **300** | **52** | < 5 | **370** | **2400** | < 5 |
| | | Sep-11 | | **400** | **7900** | < 50 | < 50 | **1200** | < 50 | **230** | < 50 | **< 50** | **260** | **1700** | **< 50** |
| | RW-1 | Apr-09 | | **130** | **990** | < 0.50 | **110** | **110** | **39** | **28** | **23** | **42** | **21** | **170** | **760** |
| | | Oct-09 | | **590** | **1900** | < 5.0 | **360** | **430** | **46** | **340** | **280** | **140** | **310** | **670** | **660** |
| | | Nov-10 | | **35** | **950** | < 5.0 | **3300** | **210** | **29** | **140** | **61** | **48** | **49** | **230** | **700** |
| | RW-2 | Nov-10 | | **81** | **11000** | < 5.0 | **460** | **1200** | **43** | **320** | **140** | **37** | **130** | **770** | **17** |
| | RW-7 | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 15 | < 5.0 |
| | RW-9 | Apr-10 | | < 5.0 | **230** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | **240** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 15 | < 5.0 |
| | | Apr-11 | | | | | | | | | | | | | |
| | | Apr-11 | | < 5 | **630** | < 5 | < 5 | < 5 | **5.4** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | RW-10 | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | RW-16A | Mar-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 5.0 UJ | < 15 | < 5.0 |
| S Refinery | KWB-2R | Oct-10 | | **510** | **5200** | < 5.0 | < 5.0 | **2000** | **82** | **280** | **150** | < 5.0 | **190** | **730** | < 5.0 |
| | | Apr-11 | | **1600** | **1400** | < 5 | < 5 | **4000** | **71** | **550** | **200** | < 5 | **110** | **2100** | < 5 |
| | MW-28 | Apr-09 | | **190** | **340** | < 0.50 | < 0.50 | **22** | **7400** | **11** | < 5.0 | < 0.60 | **8.8** | **140** | < 0.50 |
| | | Sep-09 | | **14** | **180** | < 5.0 | < 5.0 | **10** | **7700** | < 5.0 | < 5.0 | < 5.0 | **5.7** | **49** | < 5.0 |
| | | Apr-10 | | **100** | **130** | < 5.0 | < 5.0 | **8.5** | **5100** | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | **62** | < 5.0 |
| | | Oct-10 | | **44** | **180** | < 5.0 | < 5.0 | **9.2** | **3700** | < 5.0 | < 5.0 | < 5.0 | **5.2** | **58** | < 5.0 |
| | | Apr-11 | | < 5 | **27** | < 5 | < 5 | < 5 | **1100** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **41** | < 5.0 | < 5.0 | < 5.0 | **700** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| S Refinery (continued) | MW-49 | Apr-09 | | **92** | **650** | < 0.50 | < 0.50 | **34** | **160** | **17** | < 5.0 | < 0.60 | **20** | **130** | < 0.50 |
| | | Apr-10 | | **73** | **790** | < 5.0 | < 5.0 | **16** | **110** | < 5.0 | < 5.0 | < 5.0 | **9.6 J** | **120** | < 5.0 |
| | | Oct-10 | | **61** | **450** | < 5.0 | < 5.0 | **15** | **93** | **7.1** | < 5.0 | < 5.0 | **6.8** | **94** | < 5.0 |
| | | Apr-11 | | **62** | **510** | < 5 | < 5 | **12** | **110** | **9.6** | < 5 | < 5 | **11** | **94** | < 5 |
| | | Sep-11 | | **56** | **530** | < 5.0 | < 5.0 | **14** | **76** | **9.4** | < 5.0 | < 5.0 | **15** | **94** | < 5.0 |
| | | Sep-11 | FD | **55** | **490** | < 5.0 | < 5.0 | **14** | **70** | **10** | < 5.0 | < 5.0 | **15** | **91** | < 5.0 |
| | MW-50 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-52 | Apr-09 | | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-09 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-57 | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-58 | Apr-09 | | **31** | **730** | < 0.50 | < 0.50 | **37** | **220** | **16** | < 5.0 | < 0.60 | < 5.0 | **45** | < 0.50 |
| | | Sep-09 | | **39** | **1800** | < 5.0 | < 5.0 | **120** | **190** | **17** | **23** | < 5.0 | < 5.0 | **85** | < 5.0 |
| | | Apr-10 | | **34** | **1100** | < 5.0 | < 5.0 | **47** | **180** | **19** | < 5.0 | < 5.0 | < 5.0 | **34** | < 5.0 |
| | | Apr-10 | FD | **34** | **1300** | < 5.0 | < 5.0 | **47** | **200** | **18** | < 5.0 | < 5.0 | < 5.0 | **33** | < 5.0 |
| | | Oct-10 | | **53** | **6200** | < 5.0 | < 5.0 | **270** | **260** | **16** | **19** | < 5.0 | **8.0** | **200** | < 5.0 |
| | | Apr-11 | | **9.8** | **680** | < 5 | < 5 | **21** | **480** | **13** | < 5 | < 5 | < 5 | **32** | < 5 |
| | | Sep-11 | | < 5.0 | **660** | < 5.0 | < 5.0 | < 5.0 | **480** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-66 | Apr-09 | | **19** | **2100** | < 0.50 | < 0.50 | **60** | **5400** | **78** | < 5.0 | < 0.60 | < 5.0 | **21** | < 0.50 |
| | | Sep-09 | | **7.2** | **3300** | < 5.0 | < 5.0 | **37** | **5500** | **47** | < 5.0 | < 5.0 | < 5.0 | **18** | < 5.0 |
| | | Apr-10 | | **6.0** | **2300** | < 5.0 | < 5.0 | **32** | **4200** | **36** | < 5.0 | < 5.0 | < 5.0 UJ | **21** | < 5.0 |
| | | Oct-10 | | **64** | **7500** | < 5.0 | < 5.0 | **190** | **2900** | **89 UB** | < 5.0 | < 5.0 | **24** | **130** | < 5.0 |
| | | Apr-11 | | < 5 | **2200** | < 5 | < 5 | **13** | **4600** | **59** | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | **2000** | < 5 | < 5 | **10** | **4200** | **47** | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **1200** | < 5.0 | < 5.0 | **9.8** | **3000** | **39** | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| S Refinery (continued) | MW-99 | Apr-09 | | < 5.0 | **550** | < 0.50 | < 0.50 | **41** | **97** | < 5.0 | **13** | < 0.60 | < 5.0 | **26** | < 0.50 |
| | | Sep-09 | | **82** | **9200** | < 5.0 | < 5.0 | **380** | **5900** | **27** | **170** | < 5.0 | **750** | **610** | < 5.0 |
| | | Apr-10 | | **120** | **9700** | < 25 | < 25 | **450** | **4300** | < 25 | **340** | **< 25** | **2500 J** | **1100** | **< 25** |
| | | Oct-10 | | **13** | **8000** | < 5.0 | < 5.0 | **19** | **5500** | < 5.0 | **45** | < 5.0 | **45** | **130** | < 5.0 |
| | | Apr-11 | | **40** | **6700** | < 5 | < 5 | **89** | **6200** | **5.9** | **25** | < 5 | **36** | **100** | < 5 |
| | | Sep-11 | | **47** | **9300** | < 5.0 | < 5.0 | **200** | **3900** | **11** | **61** | < 5.0 | **210** | **210** | < 5.0 |
| | MW-101 | Apr-09 | | **42** | **4700** | < 0.50 | < 0.50 | **150** | **2600** | **14** | **87** | < 0.60 | **220** | **280** | < 0.50 |
| | | Sep-09 | | < 5.0 | **180** | < 5.0 | < 5.0 | **8.5** | **100** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | **560 J** | < 5.0 | < 5.0 | **36** | **94 J** | < 5.0 | < 5.0 | < 5.0 | < 5.0 UJ | < 15 | < 5.0 |
| | | Nov-10 | | < 5.0 | **420** | < 5.0 | < 5.0 | **25** | **91** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | **1100** | < 5 | < 5 | **26** | **90** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **370** | < 5.0 | < 5.0 | **11** | **83** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-103 | Mar-09 | | **220** | **1000** | < 0.50 | < 0.50 | **610** | < 5.0 | **190** | **89** | < 0.60 | **120** | **410** | < 0.50 |
| | | Sep-09 | | **100** | **860** | < 5.0 | < 5.0 | **350** | < 5.0 | **90** | **34** | < 5.0 | **22** | **170** | < 5.0 |
| | | Apr-10 | | **81** | **810** | < 5.0 | < 5.0 | **380** | < 5.0 | **59** | **20** | < 5.0 | **7.2** | **170** | < 5.0 |
| | | Apr-11 | | **10** | **650** | < 5 | < 5 | **190** | < 5 | **18** | < 5 | < 5 | < 5 | **30** | < 5 |
| | MW-104 | Mar-09 | | < 0.50 | **34** | **61** | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | **190** | **26** | < 5.0 | **10** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | **28** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | **120** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | FD | < 5.0 | **150** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | **8.9** | **66** | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **160** | **9.3** | < 5.0 | **6.4** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | **170** | **9.5** | < 5.0 | **6.6** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-106 | Sep-09 | | **290** | **15000** | < 5.0 | < 5.0 | **1100** | **39** | **180** | **< 250** | < 5.0 | **260** | **560** | < 5.0 |
| | | Apr-10 | | **240** | **9300** | < 50 | < 50 | **710** | < 50 | **130** | < 50 | **< 50** | **120 J** | **440** | **< 50** |
| | | Oct-10 | | **250** | **14000** | < 50 | < 50 | **600** | < 50 | **130** | < 50 | **< 50** | **140** | **450** | **< 50** |
| | | Apr-11 | | **190** | **9700** | < 5 | < 5 | **1300** | **33** | **100** | < 5 | < 5 | **110** | **350** | < 5 |
| | | Sep-11 | | **160** | **9900** | < 50 | < 50 | **180** | < 50 | **82** | < 50 | **< 50** | **110** | **330** | **< 50** |
| | MW-107 | Sep-09 | | **320** | **14000** | < 5.0 | < 5.0 | **1400** | **7400** | **190** | **< 250** | < 5.0 | **36** | **570** | < 5.0 |
| | | Mar-10 | | **300** | **10000 J** | < 5.0 | < 5.0 | **1000** | **5800 J** | **150** | < 120 | < 5.0 | **35** | **490** | < 5.0 |
| | | Nov-10 | | **250** | **11000** | < 5.0 | < 5.0 | **1000** | **4600** | **140** | < 120 | < 5.0 | **39** | **460** | < 5.0 |
| | | Apr-11 | | **270** | **8200** | < 5 | < 5 | **1100** | **4600** | **140** | < 5 | < 5 | **28** | **380** | < 5 |
| | | Sep-11 | | **23** | **97** | < 5.0 | < 5.0 | **110** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | MW-109 | Jan-11 | | **65** | **1200** | < 5 | < 5 | **850** | < 5 | **80** | **8.2** | < 5 | **17** | **190** | < 5 |
| | | Jan-11 | FD | **50** | **1000** | < 5 | < 5 | **780** | < 5 | **59** | **5.8** | < 5 | **12** | **140** | < 5 |
| | | Apr-11 | | **48** | **1400 UJ** | < 5 | < 5 | **470 UJ** | < 5 | **29** | < 5 | < 5 | **5.5** | **41** | < 5 |
| | | Sep-11 | | **19** | **550** | < 5.0 | < 5.0 | **190** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.7** | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| S Refinery (continued) | MW-110 | Jan-11 | | **150** | **370** | < 5 | < 5 | **1600** | < 5 | **160** | **26** | < 5 | **15** | **370** | < 5 |
| | | Apr-11 | | **170** | **270** | < 5 | < 5 | **600** | < 5 | **60** | **11** | < 5 | **6.8** | **130** | < 5 |
| | | Sep-11 | | **24** | **110** | < 5.0 | < 5.0 | **130** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | RW-4 | Apr-10 | | **7.1** | **280** | < 5.0 | < 5.0 | < 5.0 | **2500** | < 5.0 | < 5.0 | < 5.0 | **5.3 J** | **36** | < 5.0 |
| | | Apr-11 | | < 5 | **500** | < 5 | < 5 | < 5 | **7700** | < 5 | < 5 | < 5 | **6.1** | **19** | < 5 |
| | RA-313 | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | RA-1227 | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| Field E of Refinery | KWB-1A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | KWB-3AR | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | KWB-7 | Apr-09 | | < 0.50 | < 5.0 | < 0.50 | < 0.50 | < 0.50 | **59** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **42** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **34** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **22** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **16** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | **41** | < 5.0 | < 5.0 | < 5.0 | **19** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | KWB-9 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | KWB-11A | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | **12** | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **24** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.5** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | **23** | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| Field E of Refinery (continued) | KWB-11B | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | KWB-12A | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | KWB-12B | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | RW-11-1 | Nov-10 | | **5.0** | **160** | < 5.0 | < 5.0 | **24** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | RW-18 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | RA-4196 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **5.4** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.2** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **6.4** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Sep-11 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | RA-4798 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **18** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | **12** | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| Crossgradient | KWB-13 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-09 | FD | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Sep-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | NP-5 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | RA-3156 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Nov-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Sep-11 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | Analyte Group: | Volatile Organic Compounds | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Analyte: | 1,2,4-Trimethylbenzene | Benzene | Chloroform | cis-1,2-DCE | Ethylbenzene | MTBE | Naphthalene | o-Xylene | Tetrachloroethene | Toluene | Total Xylenes | Trichloroethene |
| | | Units: | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L | ug/L |
| | | CGWSL: | 15 | 5 | 100 | 70 | 700 | 125 | 30 | 203 | 5 | 750 | 620 | 5 |
| | | CGWSL Source: | EPA TW | EPA MCL | EPA MCL | EPA MCL | EPA MCL | NMED TW | WQCC HH | NMED TW | EPA MCL | WQCC HH | WQCC HH | EPA MCL |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| Upgradient | MW-53 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | FD | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | UG-1 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | | < 5.0 | | | < 5.0 | < 5.0 | | | | < 5.0 | < 15 | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | UG-2 | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | | < 5.0 | | | < 5.0 | < 5.0 | | | | < 5.0 | < 15 | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | UG-3R | Apr-09 | | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.50 | < 0.60 | < 0.50 | < 1.0 | < 0.50 |
| | | Oct-09 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Apr-10 | | | < 5.0 | | | < 5.0 | < 5.0 | | | | < 5.0 | < 15 | |
| | | Oct-10 | | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 15 | < 5.0 |
| | | Mar-11 | | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |
| | | Mar-11 | FD | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 5 | < 15 | < 5 |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| NCL | MW-18 | Apr-09 | | | | **344** | **177** | **0.721** | **1.45** | **76.9** | **1240** | **399** | **2690** | **13.7** |
| | | Sep-09 | | | | **359** | **173** | **0.713** | **1.29** | **90.3** | **1160** | **430** | **2680** | **11.2** |
| | | Mar-10 | | | | **372 UB** | **178 UB** | **1.03** | **1.70** | **92.1** | **1330** | **391** | **2850** | **14.7** |
| | | Oct-10 | | | < 20.0 | **328 J** | **207** | **0.981** | **1.56** | **91.7** | **1110** | | **2650** | **14** |
| | | Apr-11 | | | < 20 | **351** | **234** | **1.1** | **1.22** | **105** | **1220** | | **2670** | |
| | | Sep-11 | | | < 20.0 | **300** | **192** | **0.560** | < 1.00 | **76.2** | **1020** | | **2650** | |
| | MW-54A | Apr-09 | | | | **384** | **286** | **0.668** | < 0.400 | **48.4** | **754** | **520** | **2230** | < 0.500 |
| | | Oct-09 | | | | | **249** | **0.768** | | | **779** | **408** | **2240** | < 0.500 |
| | | Oct-09 | FD | | | | **262** | **0.797** | | | **758** | **504** | **2280** | < 0.500 |
| | | Apr-10 | | | | **408 UB** | **226 UB** | **1.09** | < 1.00 | **67.5 UB** | **843** | **497** | **2380** | **2.83** |
| | | Oct-10 | | | | **343** | **205** | **1.00** | < 2.00 | **57.2** | **671** | | **1980** | < 0.100 |
| | | Apr-11 | | | | **329** | **222** | **0.983** | < 1 | **65** | **749** | | **2020** | |
| | | Sep-11 | | | | **356** | **209** | **0.902** | < 1.00 | **67.8** | **811** | | **2140** | |
| | MW-54B | Apr-10 | | | | **318 UB** | **153 UB** | **0.492** | < 1.00 | **47.6 UB** | **808** | **388** | **2080** | < 0.500 |
| | | Apr-11 | | | | **311** | **190** | **0.881** | **1.16** | **50.8** | **1400** | | **2650** | |
| | MW-108 | Oct-09 | | | | | **120** | **4.93** | | | **978** | **593** | **2580** | **0.544** |
| | | Mar-10 | | | | **350 UB** | **161 UB** | **4.24** | **0.878** | **111 UB** | **1150** | **601** | **2610** | < 0.500 |
| | | Apr-10 | | | | **258 UB** | **90.8** | **1.42** | **4.18** | **48.3 UB** | **358** | **676** | **1610** | < 0.500 |
| | | Oct-10 | | | | **436** | **191** | **3.92** | **6.18** | **185** | **1510** | | **3340** | < 1.0 |
| | | Apr-11 | | | | **364** | **208** | **2.53** | **1.47** | **136** | **1330** | | **3040** | |
| | | Apr-11 | FD | | | **357** | **205** | **2.56** | **1.4** | **136** | **1320** | | **3110** | |
| | | Sep-11 | | | | **362** | **196** | **4.17** | **4.40** | **189** | **1570** | | **3680** | |
| | NCL-31 | Mar-10 | | | | **369 UB** | **176 UB** | **1.34** | **0.441** | **190 UB** | **1480** | **591** | **3000** | < 0.500 |
| | | Oct-10 | | | | **278** | **179** | **1.52** | < 1.00 | **187** | **859** | | **2250** | < 0.10 |
| | | Apr-11 | | | | **344** | **161** | **1.29** | < 1 | **180** | **1400** | | **2670** | |
| | | Sep-11 | | | | **285** | **142** | **1.02** | < 1.00 | **132** | **1250** | | **2570** | |
| | NCL-32 | Apr-09 | | | | **453** | **204** | **1.49** | **5.83** | **64.8** | **1130** | **386** | **2560** | < 0.500 |
| | | Sep-09 | | | | **989** | **198** | **2.54** | **25.3** | **76.4** | **1100** | **290** | **2540** | < 1.00 |
| | | Mar-10 | | | | **1570** | **97.5 UB** | **1.95** | **36.6** | **80.4** | **715** | **190** | **1920** | < 0.500 |
| | | Oct-10 | | | | **423** | **43.4** | **2.40** | **21.6** | **26.1 UB** | **840** | | **1680** | **4.9** |
| | NCL-33 | Apr-09 | | | | **476** | **511** | **2.22** | **4.06** | **94.4** | **937** | **483** | **3160** | **1.03** |
| | | Sep-09 | | | | **430** | **468** | **2.40** | **4.80** | **88.0** | **882** | **450** | **3010** | < 1.00 |
| | | Mar-10 | | | | **450 UB** | **462** | **2.46** | **4.02** | **88.0** | **645** | **536** | **2480** | < 0.500 |
| | | Oct-10 | | | | **472** | **383** | **2.59** | **5.20** | **99.5 UB** | **732** | | **2420** | **0.12 J** |
| | | Apr-11 | | | | **396** | **499** | **2.44** | **3.98** | **106** | **714** | | **2180** | |
| | | Sep-11 | | | | **294** | **351** | **1.99** | **3.21** | **84.9** | **559** | | **2140** | |
| | NCL-34 | Apr-09 | | | | **256** | **434** | **2.22** | **1.75** | **112** | **134** | **570** | **1860** | **1.03** |
| | | Sep-09 | | | | **230** | **379** | **1.28** | **2.04** | **121** | **128** | **550** | **1890** | < 1.00 |
| | | Mar-10 | | | | **188 UB** | **187** | **1.30 J** | **1.16 J** | **103 UB** | **121 J** | **667** | **1190 J** | < 0.500 |
| | | Mar-10 | FD | | | **381 UB** | **162 UB** | **4.60 J** | **0.961 J** | **119 UB** | **1170 J** | **576** | **2800 J** | < 0.500 |
| | | Oct-10 | | | | **276** | **410** | **1.52** | **1.93** | **112 UB** | **148** | | **1460** | **0.18** |
| | | Oct-10 | FD | | | **253 UB** | **435** | **1.52** | **2.09** | **107** | **139** | | **1670** | **0.29** |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| NCL (continued) | NCL-44 | Apr-09 | | | | **268** | **171** | **1.35** | **1.95** | **54.5** | **496** | **630** | **1800** | < 0.500 |
| | | Sep-09 | | | | **249** | **185** | **1.40** | **2.15** | **59.2** | **469** | **550** | **1710** | < 1.00 |
| | | Mar-10 | | | | **267 UB** | **166 UB** | **1.55** | **2.08** | **57.3** | **476** | **546** | **1680** | < 0.500 |
| | | Oct-10 | | | | **264** | **168** | **1.67** | **2.18** | **61.5 UB** | **443** | | **1620** | < 0.10 |
| | | Apr-11 | | | | **280** | **168** | **1.54** | **2.17** | **65.6** | **458** | | **1620** | |
| | | Sep-11 | | | | **213** | **176** | **1.48** | **1.53** | **48.4** | **383** | | **1610** | |
| | NCL-49 | Apr-09 | | | | **461** | **165** | < 0.500 | **0.708** | **117** | **1720** | **260** | **3180** | **9.65** |
| | | Apr-09 | FD | | | **457** | **163** | < 0.500 | **0.707** | **115** | **1720** | **202** | **3210** | **9.29** |
| | | Oct-09 | | | | | **152** | **0.561** | | | **1630** | **224** | **3190** | **9.33** |
| | | Apr-10 | | | | **443** | **134 UB** | **0.486** | < 1.00 | **120 UB** | **1720** | **229** | **3130** | **8.94** |
| | | Oct-10 | | | | **409** | **134** | **0.641** | < 2.00 | **106** | **1590** | | **2900** | **5.42** |
| | | Apr-11 | | | | **404** | **135** | **0.604** | < 1 | **114** | **1270** | | **2960** | |
| | | Sep-11 | | | | **455** | **124** | **0.208** | < 1.00 | **125** | **1700** | | **2850** | |
| | RW-17A | Mar-10 | | | | **459 UB** | **494 UB** | **2.61** | **5.40** | **376** | **3320** | **526** | **6680** | < 0.500 |
| TEL | TEL-1 | Apr-09 | | | | **214** | **249** | **1.96** | **0.805** | **444** | **919** | **582** | **2590** | < 0.150 |
| | | Apr-09 | FD | | | **205** | **251** | **1.93** | **1.00** | **462** | **908** | **618** | **2560** | < 0.500 |
| | | Sep-09 | | | | **280** | **126** | **2.14** | **0.881** | **430** | **507** | **640** | **2850** | < 1.00 |
| | | Apr-10 | | | | **542** | **170 UB** | **2.59** | **1.75** | **278** | **2150** | **382** | **4120** | < 0.500 |
| | | Oct-10 | | | | **267** | **256** | **2.24** | **1.10** | **425** | **967** | | **2660** | < 10.0 |
| | | Apr-11 | | | | **264** | **308** | **2.2** | **1.02** | **500** | **1060** | | **2870** | |
| | | Sep-11 | | | | **251** | **232** | **1.90** | < 1.00 | **391** | **1150** | | **3030** | |
| | TEL-2 | Apr-09 | | | | **224** | **392** | **0.562** | **1.19** | **384** | **825** | **825** | **3040** | < 0.150 |
| | | Sep-09 | | | | **206** | **411** | **0.900** | **1.34** | **357** | **737** | **930** | **3030** | < 1.00 |
| | | Apr-10 | | | | **304 UB** | **278 UB** | **0.833** | **2.54** | **337** | **1130** | **864** | **3440** | < 0.500 |
| | | Oct-10 | | | | **219** | **188** | **1.07** | **1.44** | **320** | **746** | | **2570** | **0.293** |
| | | Apr-11 | | | | **240** | **254** | **0.928** | **1.71** | **351** | **828** | | **2420** | |
| | | Sep-11 | | | | **199** | **203** | **0.865** | **1.31** | **277** | **711** | | **2680** | |
| | TEL-3 | Apr-09 | | | | **304** | **597** | **2.06** | **3.92** | **325** | **580** | **698** | **2660** | < 0.500 |
| | | Sep-09 | | | | **611** | **34.2** | **2.93** | **5.64** | **52.3** | **1520** | **400** | **3180** | < 1.00 |
| | | Apr-10 | | | | **570** | **14.2** | **2.92** | **5.27** | **28.3** | **1640** | **372** | **2900** | < 0.500 |
| | | Apr-10 | FD | | | **546** | **14.0 UB** | **2.89** | **5.52** | **31.8** | **1530** | **342** | **2860** | < 0.500 |
| | | Oct-10 | | | | **568** | **8.82** | **3.14** | **6.99** | **16.1 UB** | **1300** | | **2530** | < 10.0 |
| | | Apr-11 | | | | **558** | **35.1** | **3** | **5.76** | **29.1** | **1570** | | **2850** | |
| | | Sep-11 | | | | **460** | **50.0** | **3.04** | **5.34** | **26.6** | **1550** | | **2980** | |
| | TEL-4 | Apr-09 | | | | **274** | **508** | < 0.500 | **0.593** | **219** | **680** | **689** | **2570** | < 0.150 |
| | | Sep-09 | | | | **302** | **595** | **0.615** | **0.547** | **263** | **844** | **920** | **3220** | < 1.00 |
| | | Apr-10 | | | | **339 UB** | **523** | **0.602** | **0.538** | **311** | **957** | **774** | **3400** | < 0.500 |
| | | Oct-10 | | | | **270** | **414** | **0.787** | < 1.00 | **251** | **556** | | **2370** | < 0.100 |
| | | Apr-11 | | | | **295** | **564** | **0.804** | < 1 | **341** | **830** | | **3010** | |
| | | Sep-11 | | | | **231** | **437** | **0.840** | < 1.00 | **277** | **903** | | **3140** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP | MW-1R | Apr-09 | | | | **646** | **1830** | **0.515** | **3.62** | **1150** | **1840** | **167** | **6240** | < 0.500 |
| | | Sep-09 | | | | **538** | **1690** | **0.612** | **4.18** | **950** | **1850** | **198** | **5960** | < 1.00 |
| | | Apr-10 | | | | **576** | **1640** | **0.591** | **4.24** | **946 UB** | **1900** | **207** | **6040** | < 0.500 |
| | | Mar-11 | | | | **549** | **1250** | **0.662** | **4.53** | **889** | **1400** | | **5360** | |
| | MW-2A | Apr-09 | | | | **562** | **3750** | **4.74** | **5.34** | **2550** | **2960** | **335** | **10400** | **0.712** |
| | | Apr-09 | | | | **478** | **3230** | **2.64** | **9.23** | **2540** | **4960** | **523** | **12800** | < 0.150 |
| | | Sep-09 | | | | **394** | **2020** | **5.45** | **4.58** | **1180** | **1980** | **207** | **6900** | < 1.00 |
| | | Apr-10 | | | | **722** | **4780** | **4.16** | **5.85** | **3680** | **3940** | **378** | **6290** | < 0.500 |
| | | Oct-10 | | | | **664** | **3710** | **20.3** | **6.74** | **3010 UB** | **3550** | | **10200** | < 0.100 |
| | | Oct-10 | FD | | | **618** | **3480 J** | **20.0** | **6.37** | **2830 UB** | **3370 J** | | **10100 J** | < 0.100 |
| | | Mar-11 | | | | **536** | **2800** | **3.72** | **5.26** | **2870 J** | **2950** | | **10600** | |
| | | Sep-11 | | | | **528** | **4490** | **2.40** | **5.34** | **3420** | **4720** | | **14400** | |
| | MW-2B | Apr-10 | | | | **470 UB** | **586 UB** | **0.933** | **3.08** | **441 UB** | **1160 UB** | **168** | **3100** | < 0.500 |
| | MW-3 | Apr-09 | | | | **517** | **1090** | **1.91** | **4.26** | **730** | **2260** | **236** | **4960** | < 0.500 |
| | | Sep-09 | | | | **473** | **976** | **2.11** | **4.83** | **699** | **1870** | **236** | **4700** | < 1.00 |
| | | Apr-10 | | | | **578** | **906 UB** | **1.94 J** | **3.82** | **838 UB** | **2030 UB** | **209** | **4850** | < 0.500 |
| | | Oct-10 | | | | **454 UB** | **894** | **2.31** | **5.59** | **676 UB** | **1580** | | **4360** | < 0.100 UJ |
| | | Mar-11 | | | | **489** | **731** | **1.59** | **4.7** | **770** | **1560** | | **4500** | |
| | | Sep-11 | | | | **324** | **892** | **1.67** | **3.54** | **721** | **1510** | | **4230** | |
| | MW-4A | Apr-09 | | | | **352** | **1180** | **1.55** | **5.33** | **725** | **1540** | **216** | **4540** | < 0.500 |
| | | Sep-09 | | | | **380** | **1280** | **1.65** | **3.74** | **833** | **1570** | **222** | **4710** | < 1.00 |
| | | Apr-10 | | | | **408 UB** | **1150 UB** | **1.70** | **5.00** | **778 UB** | **1700** | **251** | **4500** | < 0.500 |
| | | Apr-10 | FD | | | **372 UB** | **1190 UB** | **1.61** | **4.48** | **718 UB** | **1780** | **253** | **4960** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Oct-10 | | | | **443 UB** | **1310 J** | **18.9** | **5.74** | **955 UB** | **1700 J** | | **4660 J** | < 0.100 UJ |
| | | Apr-11 | | | | **422** | **1080** | **1.52** | **5.02** | **868** | **1320** | | **4650** | |
| | | Sep-11 | | | | **426** | **1220** | **1.63** | **3.68** | **828** | **1890** | | **4910** | |
| | MW-4B | Apr-10 | | | | **298 UB** | **1010** | **0.757** | **2.36** | **612 UB** | **1200** | **207** | **3470** | < 0.500 |
| | | Apr-11 | | | | **383** | **660** | **1.01** | **3.53** | **560** | **958** | | **3660** | |
| | MW-5A | Sep-09 | | | | **468** | **3360** | **2.71** | **7.98** | **2800** | **5160** | **414** | **13200** | < 1.00 |
| | | Sep-09 | FD | | | **513** | **3320** | **2.70** | **8.28** | **3130** | **5160** | **419** | **16400** | < 1.00 |
| | | Apr-10 | | | | **483** | **4010** | **2.34** | **7.92** | **3340** | **7050** | **497** | **15200** | < 0.500 |
| | | Oct-10 | | | | **584** | **2760** | **18.7** | **10.4** | **3310 UB** | **4660** | | **10700** | < 0.100 |
| | | Apr-11 | | | | **536** | **2970** | **1.43** | **8.19** | **3310** | **4590** | | **13800** | |
| | | Sep-11 | | | | **492** | **3670** | **2.37** | **7.68** | **3310** | **6330** | | **15900** | |
| | MW-5B | Apr-10 | | | | **540** | **1720** | **0.852** | **9.18** | **1660** | **2740** | **358** | **7900** | < 0.500 |
| | | Apr-11 | | | | **471** | **1560** | **1.31** | **8.77** | **1400** | **1800** | | **6310** | |
| | MW-6A | Apr-09 | | | | **294** | **864** | **1.35** | **1.32** | **733** | **1510** | **148** | **3720** | < 0.500 |
| | | Sep-09 | | | | **259** | **876** | **1.32** | **1.18** | **679** | **1410** | **130** | **3680** | < 0.100 |
| | | Apr-10 | | | | **316 UB** | **963 UB** | **1.33** | **1.20** | **770 UB** | **1540 UB** | **136** | **3700** | < 0.500 |
| | | Mar-11 | | | | **319** | **680** | **1.13** | **1.52** | **758** | **1120** | | **3680** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-6B | Apr-10 | | | | **447 UB** | **1290 UB** | **0.544** | **4.22** | **694 UB** | **1530 UB** | **104** | **4570** | < 0.500 |
| | | Mar-11 | | | | **377** | **707** | **1.37** | **3.91** | **664** | **989** | | **3160** | |
| | MW-7A | Apr-09 | | | | **434** | **1980** | **0.972** | **4.02** | **1820** | **2450** | **455** | **6880** | < 0.150 |
| | | Sep-09 | | | | **360** | **1960** | **1.10** | **3.90** | **1550** | **2430** | **246** | **7580** | < 0.100 |
| | | Apr-10 | | | | **341 UB** | **1850** | **1.16** | **4.07** | **1560 UB** | **2510** | **278** | **6580** | < 0.500 |
| | | Oct-10 | | | | **393 UB** | **1570** | **16.5** | **4.19** | **1630 UB** | **2080** | | **6330** | < 0.100 |
| | | Apr-11 | | | | **302** | **1510** | **1.28** | **3.95** | **1650** | **1760** | | **6720** | |
| | | Sep-11 | | | | **310** | **1730** | **1.08** | **3.74** | **1370** | **2300** | | **6360** | |
| | MW-7B | Apr-10 | | | | **574** | **1230** | **0.913** | **6.42** | **890 UB** | **1910** | **189** | **5030** | < 0.500 |
| | | Apr-11 | | | | **485** | **881** | **0.921** | **6.58** | **600** | **1340** | | **4080** | |
| | MW-10 | Apr-09 | | | | | **1370** | **0.519** | **5.69** | **928** | **1880** | **216** | **5260** | < 0.500 |
| | | Sep-09 | | | | **497** | **1680** | **0.596** | **3.29** | **945** | **1900** | **236** | **5530** | < 0.100 |
| | | Apr-10 | | | | **516** | **1340 UB** | **0.517** | **3.22** | **1060 UB** | **1940** | **249** | **5150** | < 0.500 |
| | | Jun-10 | | | | | | | | | | | | |
| | | Oct-10 | | | | **568 UB** | **1160** | **0.730** | **3.70** | **977** | **1710** | | **5060** | < 1.00 |
| | | Apr-11 | | | | **544** | **991** | **0.614** | **3.55** | **973** | **1620** | | **4970** | |
| | | Sep-11 | | | | **468** | **1310** | **0.428** | **3.46** | **842** | **1880** | | **4970** | |
| | | Sep-11 | FD | | | **450** | **1300** | **0.430** | **3.39** | **800** | **1870** | | **5280** | |
| | MW-11A | Apr-09 | | | | **1160** | **9040** | **0.503** | **21.2** | **4930** | **2820** | **416** | **18000** | < 0.500 |
| | | Sep-09 | | | | **1010** | **9290** | **0.698** | **21.9** | **4370** | **2850** | **366** | **19100** | < 0.100 |
| | | Apr-10 | | | | **1160** | **8570** | **0.710** | **20.5** | **4890** | **2980** | **418** | **17600** | < 0.500 |
| | | Apr-10 | FD | | | **1130** | **8300** | **0.675** | **21.9** | **4810** | **2880** | **398** | **17400** | < 0.500 |
| | | Mar-11 | | | | **1350** | **6610** | **0.408** | **22.5** | **5260** | **2260** | | **17400** | |
| | MW-11B | Apr-10 | | | | **862** | **6250** | **0.723** | **34.4** | **3680 R** | **3020** | **259** | **14500** | < 0.500 |
| | | Mar-11 | | | | **1190** | **4920** | **0.606** | **36.3** | **4070** | **2280** | | **13600** | |
| | MW-15 | Apr-09 | | | | **621** | **1280** | **3.43** | **7.25** | **806** | **2070** | **167** | **5290** | < 0.150 |
| | | Sep-09 | | | | **620** | **1500** | **1.22** | **5.85** | **775** | **1970** | **111** | **5830** | < 0.100 |
| | | Apr-10 | | | | **650** | **1280 UB** | **4.01** | **7.74** | **816 UB** | **2150** | **199** | **5520** | < 0.500 |
| | | Mar-11 | | | | **614** | **914** | **3.95** | **8.43** | **971** | **1460** | | **5100** | |
| | MW-18A | Apr-09 | | | | **649** | **5410** | **2.41** | **31.3** | **3530** | **5000** | **372** | **15600** | < 0.150 |
| | | Sep-09 | | | | **616** | **6130** | **2.32** | **38.0** | **3590** | **5180** | **308** | **16400** | < 0.100 |
| | | Apr-10 | | | | **727** | **5220** | **1.16** | **35.6** | **3810** | **5250** | **328** | **13800** | < 0.500 |
| | | Jun-10 | | | | | | | | | | | | |
| | | Oct-10 | | < 20.0 | | **680 UB** | **6000** | **19.3** | **43.2** | **3630 UB** | **5480** | | **14400** | < 0.100 |
| | | Apr-11 | | < 20 | | **601** | **4550** | < 0.1 | **39.7** | **4430** | **3850** | | **16200** | |
| | | Sep-11 | | < 20.0 | | **669** | **5850** | **1.65** | **36.8** | **3680** | **5150** | | **17700** | |
| | MW-18B | Apr-10 | | | | **604** | **1060 UB** | **0.636** | **6.34** | **701 UB** | **2060** | **199** | **5110** | < 0.500 |
| | | Apr-11 | | | | **450** | **739** | **0.905** | **7.31** | **445** | **1380** | | **1820** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-22A | Apr-09 | | | | **565** | **1750** | **0.561** | **3.64** | **1320** | **1920** | **196** | **5780** | < 0.500 |
| | | Sep-09 | | | | **480** | **1810** | **0.517** | **3.13** | **1140** | **2040** | **217** | **6430** | < 0.100 |
| | | Apr-10 | | | | **474** | **1650** | **0.344** | **3.45** | **1140 UB** | **2030** | **219** | **6070** | < 0.500 |
| | | Apr-10 | FD | | | **469** | **1620** | **0.360** | **3.51** | **1140 UB** | **1960** | **229** | **5860** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Apr-11 | | | | **558** | **1550** | **0.496** | **3.91** | **1240** | **1690** | | **5680** | |
| | | Sep-11 | | | | **445** | | | **3.34** | **1060** | | | | |
| | MW-22B | Apr-10 | | | | **485** | **1310 UB** | **0.364** | **3.71** | **972 UB** | **1910** | **249** | **5380** | < 0.500 |
| | | Apr-11 | | | | **515** | **1210** | **0.547** | **3.83** | **891** | **1620** | | **4780** | |
| | MW-70 | Apr-09 | | | | **647** | **1100** | < 0.500 | **4.38** | **637** | **2010** | **264** | **4990** | < 0.150 |
| | | Sep-09 | | | | **576** | **1050** | **0.606** | **4.69** | **534** | **1970** | **217** | **5390** | < 0.100 |
| | | Apr-10 | | | | **651** | **838 UB** | **0.481** | **4.79** | **663 UB** | **1760** | **209** | **4970** | < 0.500 |
| | | Jun-10 | | | | | | | | | | | | |
| | | Oct-10 | | | | | | | | | | | | |
| | | Apr-11 | | | | **584** | **775** | **0.302** | **4.7** | **591** | **1450** | | **4460** | |
| | | Sep-11 | | | | **530** | | | **4.49** | **519** | | | | |
| | MW-72 | Mar-09 | | | | **762** | **3800** | **5.84** | **8.88** | **2130** | **2760** | **317** | **10600** | < 0.500 |
| | | Sep-09 | | | | **747** | **4050** | **5.36** | **9.55** | **2200** | **2820** | **228** | **10800** | < 0.100 |
| | | Apr-10 | | | | **904** | **3790** | **5.88** | **9.30** | **2540** | **2860** | **368** | **9710** | < 0.500 |
| | | Oct-10 | | | | **666 UB** | **2940** | **5.92** | **8.78** | **1950** | **2370** | | **8530** | < 1.00 |
| | | Mar-11 | | | | **596** | **2950** | **6.31** | **9.2** | **2150** | **2240** | | **9050** | |
| | | Sep-11 | | | | **568** | **4100** | **6.63** | **8.69** | **1760** | **2790** | | **8940** | |
| | MW-73 | Mar-09 | | | | **571** | **2410** | **2.06** | **2.20** | **2040** | **3770** | **452** | **10200** | < 0.500 |
| | | Sep-09 | | | | **542** | **2290** | **3.38** | **3.71** | **2190** | **3570** | **402** | **9130** | **1.44** |
| | | Apr-10 | | | | **699** | **2190** | **3.85 J** | **3.81** | **2710** | **3640** | **447** | **9390** | **1.26** |
| | | Oct-10 | | | | **633 UB** | **1920** | **1.96** | **2.60** | **2170** | **3250** | | **8920** | < 0.100 UJ |
| | | Mar-11 | | | | **554** | **1740** | **1.26** | **2.56** | **2450** | **2790** | | **8760** | |
| | | Sep-11 | | | | **519** | **2240** | **1.38** | **3.32** | **1960** | **3680** | | **8130** | |
| | MW-74 | Mar-09 | | | | **636** | **2060** | **8.53** | **36.2** | **1930** | **3270** | **360** | **8140** | **0.552** |
| | | Sep-09 | | | | **582** | **2050** | **8.73** | **37.9** | **1880** | **3240** | **373** | **8610** | **3.16** |
| | | Apr-10 | | | | **683** | **1960** | **8.49** | **35.3** | **2270** | **3440** | **388** | **8920** | **13.9** |
| | | Apr-10 | FD | | | **655** | **1950** | **8.01** | **34.4** | **2250** | **3450** | **368** | **8820** | **13.8** |
| | | Oct-10 | | | | **643** | **1810** | **23.3** | **47.8** | **2410 UB** | **3330** | | **8670** | < 0.100 |
| | | Mar-11 | | | | **598** | **1640** | **7.9** | **47.2** | **2260** | **2710** | | **7990** | |
| | | Sep-11 | | | | **561** | **2000** | **7.78** | **35.4** | **1750** | **3450** | | **7820** | |
| | MW-75 | Mar-09 | | | | **340** | **1480** | **9.93** | **21.5** | **1510** | **2020** | **509** | **5840** | < 0.500 |
| | | Sep-09 | | | | **322** | **1500** | **8.48** | **18.1** | **1370** | **1840** | **591** | **5900** | < 0.100 |
| | | Sep-09 | FD | | | **340** | **1550** | **8.46** | **18.2** | **1430** | **1910** | **581** | **5800** | < 0.100 |
| | | Apr-10 | | | | **444 UB** | **1450 J** | **8.66 J** | **20.0 J** | **1890 J** | **1940** | **626 J** | **6060 J** | < 0.500 |
| | | Oct-10 | | | | **421 UB** | **1310** | **21.7** | **19.7** | **1760 UB** | **1930** | | **5330** | < 0.100 |
| | | Mar-11 | | | | **330** | **1150** | **7.96** | **22** | **1940** | **1460** | | **5880** | |
| | | Sep-11 | | | | **327** | **1460** | **7.36** | **16.9** | **1380** | **1960** | | **5340** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-76 | Mar-09 | | | | **415** | **1400** | **3.32** | **25.2** | **949** | **1960** | **266** | **5460** | **0.724** |
| | | Sep-09 | | | | **450** | **1310** | **3.22** | **23.6** | **1130** | **2000** | **344** | **5710** | < 0.100 |
| | | Apr-10 | | | | **418 UB** | **1380 UB** | **3.24** | **28.1** | **1010 UB** | **2030 UB** | **288** | **5320** | < 0.500 |
| | | Oct-10 | | | | **389 UB** | **1220** | **2.72** | **28.4** | **904 UB** | **1640** | | **4850** | < 0.100 |
| | | Mar-11 | | | | **384** | **1110** | **3.09** | **30.4** | **1400** | **1470** | | **4690** | |
| | | Sep-11 | | | | **338** | **1280** | **2.59** | **23.1** | **799** | **1730** | | **4930** | |
| | MW-77 | Mar-09 | | | | **439** | **1580** | **2.76** | **43.3** | **1210** | **2420** | **463** | **6460** | < 0.200 |
| | | Sep-09 | | | | **445** | **1510** | **2.53** | **49.7** | **1380** | **2310** | **494** | **6080** | < 0.100 |
| | | Apr-10 | | | | **505** | **1410 UB** | **2.15** | **55.2** | **1330 UB** | **2810** | **517** | **6920** | < 0.500 |
| | | Oct-10 | | | < 100 | **452 UB** | **1170** | **1.37** | **62.3** | **1140 UB** | **2200** | | **2340** | < 0.100 |
| | | Mar-11 | | | < 20 | **400** | **1100** | **2.44** | **39** | **1230** | **1580** | | **5460** | |
| | | Mar-11 | FD | | < 20 | **399** | **1090** | **2.44** | **37.9** | **1240** | **1560** | | **5240** | |
| | | Sep-11 | | | < 20.0 | **477** | **785** | **1.50** | **65.0** | **1320** | **3610** | | **7660** | |
| | MW-78 | Mar-09 | | | | **372** | **1110** | **8.38** | **21.9** | **835** | **2000** | **443** | **5420** | < 0.200 |
| | | Sep-09 | | | | **339** | **1080** | **11.1** | **20.3** | **805** | **1760** | **358** | **5030** | < 0.100 |
| | | Apr-10 | | | | **369 UB** | **622** | **15.2** | **22.1** | **650 UB** | **2150** | **557** | **5120** | **1.06** |
| | | Jun-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **345** | **811** | **8.82** | **26.4** | **970** | **1480** | | **4700** | |
| | MW-79 | Mar-09 | FD | | | **606** | **2290** | **11.4** | **11.3** | **1690** | **2460** | **216** | **6680 H** | **0.760** |
| | | Mar-09 | | | | **562** | **2120** | **11.4** | **10.1** | **1490** | **2230** | **246** | **6600** | **0.762** |
| | | Sep-09 | | | | **607** | **2170** | **10.2** | **9.80** | **1400** | **2180** | **218** | **7770** | < 1.00 J |
| | | Apr-10 | | | | **684** | **2230** | **10.0** | **10.5** | **1630 UB** | **2410** | **219** | **6670** | **1.13** |
| | | Oct-10 | | | | **804 UB** | **1790** | **9.62** | **10.7** | **1540** | **2160** | | **6530** | **2.00** |
| | | Mar-11 | | | | **525** | **1590** | **8.9** | **9.84** | **1380** | **2060** | | **6240** | |
| | | Sep-11 | | | | **412** | **1660** | **10.5** | **8.74** | **1330** | **2600** | | **5960** | |
| | MW-80 | Mar-09 | | | | **535** | **1300** | **4.75** | **3.56** | **1200** | **1900** | **207** | **5110** | **0.809** |
| | | Sep-09 | | | | **537** | **1340** | **4.28** | **3.57** | **851** | **1930** | **184** | **5650** | < 0.100 |
| | | Apr-10 | | | | **720** | **1330 UB** | **3.70** | **3.54** | **1060 UB** | **2130** | **164** | **5750** | < 0.500 |
| | | Mar-11 | | | | **528** | **1190** | **3.13** | **4.08** | **1030** | **1680** | | **4820** | |
| | MW-81 | Mar-09 | | | | **566** | **1490** | **8.92** | **8.81** | **1060** | **2260** | **286** | **6140** | **21.6** |
| | | Sep-09 | | | | **501** | **1290** | **8.55** | **6.50** | **993** | **1990** | **218** | **4990** | **4.57** |
| | | Apr-10 | | | | **625** | **1240 UB** | **8.55** | **8.77** | **1380 UB** | **2250** | **268** | **5790** | **25.7** |
| | | Mar-11 | | | | **478** | **948** | **7.92** | **8.7** | **1340** | **1610** | | **5080** | |
| | MW-82 | Mar-09 | | | | **348** | **1460** | **13.1** | **8.91** | **1630** | **2380** | **852** | **6320** | < 0.500 |
| | | Sep-09 | | | | **327** | **1480** | **13.4** | **9.14** | **1640** | **2420** | **718** | **7090** | < 1.00 |
| | | Apr-10 | | | | **382 UB** | **1530 UB** | **11.0** | **8.25** | **1930** | **2390** | **994** | **6320** | < 0.500 |
| | | Mar-11 | | | | **318** | **1170** | **13.1** | **10.4** | **2020** | **2020** | | **6120** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | MW-83 | Mar-09 | | | | **339** | **1180** | **4.03** | **29.2** | **946** | **1840** | **502** | **5050** | < 0.500 |
| | | Sep-09 | | | | **386** | **715** | **4.32** | **41.8** | **1010** | **2950** | **655** | **6690** | < 1.00 |
| | | Apr-10 | | | | **334 UB** | **1020 UB** | **3.55** | **34.8** | **936 UB** | **2410** | **527** | **5490** | < 0.500 |
| | | Jun-10 | | | | | | | | | | | | |
| | | Oct-10 | | | | **433 UB** | **440** | **4.73 J** | **51.5** | **694 UB** | **2940** | | **17300** | **2.96** |
| | | Mar-11 | | | | **336** | **1010** | **3.17** | **29.4** | **996** | **1450** | | **4420** | |
| | | Sep-11 | | | | **365** | **960** | **3.12** | **23.0** | **725** | **1940** | | **5280** | |
| | MW-84 | Mar-09 | | | | **608** | **1770** | **4.84** | **6.64** | **1400** | **3490** | **561** | **8470** | < 0.500 |
| | | Sep-09 | | | | **654** | **2010** | **4.84** | **6.32** | **1560** | **3780** | **434** | **8380** | < 1.00 |
| | | Apr-10 | | | | **622** | **1580 UB** | **6.79** | **7.51** | **1560 UB** | **4100** | **487** | **9060** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **586** | **1470** | **5.79** | **7.64** | **1480** | **2870** | | **8400** | |
| | | Sep-11 | | | | | | | | | | | | |
| | MW-87 | Apr-09 | | | | **677** | **4340** | **1.52** | **23.1** | **2670** | **4110** | **255** | **14300** | < 0.500 |
| | | Sep-09 | | | | **594** | **4290** | **1.67** | **22.4** | **2720** | **4300** | **270** | **13000** | < 1.00 |
| | | Apr-10 | | | | **697** | **4100** | **0.913** | **23.3** | **3120** | **4260** | **268** | **11600** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Oct-10 | FD | | | | | | | | | | | |
| | | Apr-11 | | | | **610** | **3340** | **1.47** | **21.5** | **2660** | **3310** | | **11800** | |
| | | Sep-11 | | | | **556** | | | **21.0** | **2460** | | | | |
| | MW-88 | Apr-09 | | | | **374** | **1470** | **0.733** | **3.79** | **1010** | **1890** | **201** | **5580** | **0.595** |
| | | Apr-09 | FD | | | **392** | **1500** | **0.765** | **2.94** | **1030** | **1990** | **192** | **6500** | < 0.500 |
| | | Sep-09 | | | | **348** | **1370** | **0.814** | **2.79** | **973** | **1800** | **207** | **5380** | < 1.00 |
| | | Sep-09 | FD | | | **324** | **1370** | **0.818** | **2.69** | **901** | **1800** | **212** | **5390** | < 1.00 |
| | | Apr-10 | | | | **409 UB** | **1370 UB** | **0.917** | **3.21** | **1080 UB** | **1910** | **219** | **5760** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Apr-11 | | | | **442** | **1290** | **1.01** | **3.1** | **1320** | **1650** | | **5450** | |
| | | Apr-11 | FD | | | **428** | **1350** | **1.1** | **3.04** | **1150** | **1730** | | **5050** | |
| | | Sep-11 | | | | **306** | | | **2.87** | **848** | | | | |
| | OCD-1R | Apr-09 | | | | **569** | **2170** | **5.26** | **5.21** | **1220** | **2220** | **172** | **6220** | < 0.500 |
| | | Apr-10 | | | | **668** | **2720** | **4.93** | **5.09** | **1920** | **2740** | **268** | **7350** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **532** | **1810** | **4.09** | **4.51** | **1800** | **2010** | | **7200** | |
| | | Sep-11 | | | | **510** | | | **4.84** | **2340** | | | | |
| | OCD-2A | Mar-09 | FD | | | **656** | **2270** | **0.776** | **4.81** | **1390** | **2650** | **236** | **6980 H** | **0.714** |
| | | Apr-09 | | | | **590** | **2360** | **0.811** | **4.09** | **1250** | **2770** | **175** | **7080** | < 0.500 |
| | | Sep-09 | | | | **482** | **1570** | **0.718** | **3.64** | **825** | **1770** | **169** | **5380** | < 1.00 |
| | | Apr-10 | | | | **604** | **1910** | **1.11** | **2.94** | **1430 UB** | **2770** | **259** | **7030** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **577** | **1300** | **1.02** | **3.91** | **1210** | **1790** | | **5850** | |
| | | Mar-11 | FD | | | **587** | **1250** | **0.926** | **3.93** | **1310** | **1670** | | **5820** | |
| | | Sep-11 | | | | **516** | | | **3.97** | **582** | | | | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | OCD-2B | Apr-10 | | | | **676** | **1420** | **0.757** | **5.53** | **776 UB** | **1860** | **128** | **5330** | < 0.500 |
| | OCD-3 | Apr-09 | | | | **426** | **1010** | **0.783** | **12.9** | **596** | **1350** | **125** | **3700** | < 0.500 |
| | | Sep-09 | | | | **377** | **958** | **0.949** | **11.4** | **490** | **1490** | **130** | **4120** | < 1.00 |
| | | Apr-10 | | | | **562** | **1410** | **0.896** | **12.6** | **1100 UB** | **2150** | **219** | **5640** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **449** | **697** | **0.997** | **12.4** | **1040** | **1250** | | **4680** | |
| | | Sep-11 | | | | **341** | | | **10.5** | **445** | | | | |
| | OCD-4 | Apr-09 | | | | **777** | **4630** | **0.595** | **35.4** | **2380** | **2910** | **161** | **10800** | < 0.500 |
| | | Sep-09 | | | | **743** | **4590** | **0.723** | **33.4** | **2460** | **2770** | **193** | **10800** | < 1.00 |
| | | Apr-10 | | | | **868** | **4630** | **0.780** | **35.5** | **2890** | **2910** | **229** | **11600** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Apr-11 | | | | **786** | **4290** | **0.699** | **41.6** | **3160** | **2350** | | **11100** | |
| | | Sep-11 | | | | **732** | | | **35.0** | **2240** | | | | |
| | OCD-5 | Apr-09 | | | | **789** | **4950** | **0.614** | **32.8** | **2820** | **2990** | **184** | **11600** | < 0.500 |
| | | Sep-09 | | | | **764** | **4690** | **0.754** | **29.9** | **2780** | **2890** | **217** | **12600** | < 1.00 |
| | | Apr-10 | | | | **878** | **4580** | **0.775** | **29.2** | **3170** | **2880** | **199** | **12100** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Apr-11 | | | | **706** | **3890** | **0.75** | **35** | **3020** | **2220** | | **5410** | |
| | | Sep-11 | | | | **686** | | | **27.0** | **2830** | | | | |
| | OCD-6 | Apr-09 | | | | **599** | **3480** | **3.22** | **11.6** | **2710** | **3270** | **566** | **11400** | < 0.500 |
| | | Sep-09 | | | | **545** | **3680** | **3.29** | **12.2** | **2590** | **3170** | **564** | **11300** | < 1.00 |
| | | Apr-10 | | | | **773** | **3660** | **3.15** | **13.1** | **3310** | **2960** | **487** | **10400** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **600** | **2630** | **3.18** | **13** | **3050** | **2550** | | **10200** | |
| | | Sep-11 | | | | **544** | | | **13.1** | **2470** | | | | |
| | OCD-7A | Apr-09 | | | | **550** | **2170** | **4.57** | **7.16** | **2000** | **3050** | **601** | **9210** | **0.673** |
| | | Sep-09 | | | | **588** | **2200** | **4.32** | **7.32** | **2040** | **3280** | **540** | **9530** | < 1.00 |
| | | Sep-09 | FD | | | **512** | **2160** | **4.41** | **6.69** | **1840** | **3220** | **554** | **9890** | < 1.00 |
| | | Apr-10 | | | | **719** | **2010** | **4.12** | **6.86** | **2690** | **3210** | **597** | **8740** | < 0.500 |
| | | Oct-10 | | | | | | | | | | | | |
| | | Mar-11 | | | | **572** | **1610** | **3.59** | **8.28** | **2590** | **2450** | | **8150** | |
| | | Sep-11 | | | | **512** | | | **6.55** | **1790** | | | | |
| | OCD-7B | Apr-10 | | | | **642** | **676 UB** | **1.00** | **10.7** | **841 UB** | **2330** | **193** | **4900** | < 0.500 |
| | | Apr-10 | FD | | | **628** | **688 UB** | **1.03** | **10.9** | **832 UB** | **2380** | **189** | **4780** | < 0.500 |
| | | Mar-11 | | | | **554** | **643** | **1.05** | **13** | **718** | **1580** | | **4430** | |
| | OCD-8A | Apr-09 | | | | **573** | **2700** | **2.84** | **7.88** | **2220** | **3380** | **499** | **9550** | < 0.150 |
| | | Sep-09 | | | | **645** | **2880** | **3.40** | **9.25** | **2500** | **3840** | **520** | **10100** | < 1.00 |
| | | Apr-10 | | | | **576** | **2270** | **2.87** | **7.73** | **2100** | **3420** | **527** | **8930** | < 0.500 |
| | | Oct-10 | | < 20.0 | | | | | | | | | | |
| | | Apr-11 | | < 20 | | **627** | **2720** | **3.22** | **10.2** | **2860** | **3510** | | **9840** | |
| | | Apr-11 | FD | < 20 | | **619** | **2440** | **2.25** | **9.54** | **2830** | **3160** | | **9640** | |
| | | Sep-11 | | < 20.0 | | **582** | | | **8.20** | **2220** | | | | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| EP (continued) | OCD-8B | Apr-10 | | | | **637** | **2040** | **0.803** | **8.18** | **1450 UB** | **2810** | **259** | **7940** | < 0.500 |
| | | Apr-11 | | | | **630** | **1660** | **0.651** | **9** | **1620** | **1960** | | **6780** | |
| TMD | MW-8 | Apr-09 | | | | **359** | **344** | **1.89** | **1.53** | **275** | **2570** | **296** | **4380** | **3.21** |
| | | Oct-09 | | | | | **425** | **2.02** | | | **2690** | **293** | **5350** | **12.2** |
| | | Apr-10 | | | | **468 UB** | **326 UB** | **1.94** | **1.57** | **399 UB** | **2680** | **298** | **4760** | **5.69** |
| | | Oct-10 | | | | **513 UB** | **472** | **3.41** | **2.11** | **422** | **2850** | | **5140** | **16.3** |
| | | Apr-11 | | | | **571** | **492** | **1.91** | **2.39** | **426** | **2040** | | **4920** | |
| | | Sep-11 | | | | **488** | **565** | **1.72** | **2.79** | **393** | **2510** | | **5550** | |
| | MW-16 | Apr-09 | | | | **528** | **502** | **2.12** | **8.10** | **434** | **2280** | **249** | **4740** | **0.577** |
| | | Apr-09 | FD | | | **549** | **521** | **2.15** | **8.80** | **442** | **1990** | **296** | **4830** | **0.579** |
| | | Sep-09 | | | | **514** | **495** | **2.01** | **8.58** | **391** | **2350** | **262** | **4510** | < 1.00 |
| | | Apr-10 | | | | **481** | **418 UB** | **2.26** | **8.47** | **355 UB** | **2320** | **271** | **4500** | < 0.500 |
| | | Apr-11 | | | | **578** | **399** | **2.16** | **8.22** | **352** | **1870** | | **4230** | |
| | | Apr-11 | FD | | | **561** | **447** | **2.12** | **8.42** | **358** | **1410** | | **4190** | |
| | MW-20 | Apr-09 | | | | **494** | **353** | **2.32** | **0.632** | **290** | **3120** | **277** | **5480** | **2.12** |
| | | Oct-09 | | | | | **301** | **2.46** | | | **3000** | **273** | **5710** | **1.50** |
| | | Apr-10 | | | | **525** | **279 UB** | **2.51** | < 1.00 | **301 UB** | **3170** | **269** | **5170** | **0.811** |
| | | Apr-11 | | | | **541** | **278** | **2.4** | < 1 | **294** | **2440** | | **10200** | |
| | MW-21 | Apr-09 | | | | **556** | **482** | **1.71** | **1.92** | **479** | **3150** | **301** | **5800** | **15.6** |
| | | Oct-09 | | | | | **475** | **1.62** | | | **2930** | **293** | **5950** | **16.8** |
| | | Apr-10 | | | | **598** | **519 UB** | **1.88** | **1.96** | **503 UB** | **2800** | **259** | **5830** | **27.4** |
| | | Oct-10 | | | | **514 UB** | **479** | **1.96** | **2.06** | **420** | **2500** | | **5210** | **22.1** |
| | | Apr-11 | | | | **580** | **608** | **1.74** | **2.12** | **481** | **2320** | | **5020** | |
| | | Sep-11 | | | | **497** | **589** | **1.60** | **2.84** | **391** | **2540** | | **5700** | |
| | MW-25 | Apr-09 | | | | **294** | **882** | **0.878** | **5.20** | **581** | **1240** | **157** | **3570** | **0.525** |
| | | Sep-09 | | | | **279** | **825** | **1.10** | **3.46** | **535** | **1230** | **159** | **3560** | < 1.00 |
| | | Apr-10 | | | | **259 UB** | **748 UB** | **1.03** | **3.57** | **445 UB** | **1240 UB** | **178** | **3430** | < 0.500 |
| | | Mar-11 | | | | **276** | **531** | **1.09** | **3.68** | **487** | **821** | | **3120** | |
| | MW-26 | Apr-09 | | | | **566** | **734** | **1.74** | **4.38** | **502** | **3540** | **177** | **6720** | < 0.500 |
| | | Sep-09 | | | | **445** | **590** | **1.92** | **3.90** | **313** | **2860** | **179** | **5310** | < 1.00 |
| | | Apr-10 | | | | **449 UB** | **526 UB** | **1.83** | **4.43** | **332 UB** | **2920** | **205** | **5410** | < 0.500 |
| | | Apr-11 | | | | **548** | **431** | **1.75** | **4.06** | **334** | **2190** | | **4460** | |
| | MW-27 | Apr-09 | | | | **441** | **212** | **0.979** | **9.23** | **142** | **1430** | **201** | **2720** | **1.65** |
| | | Sep-09 | | | | **379** | **201** | **1.18** | **9.54** | **135** | **1350** | **199** | **2710** | **2.60** |
| | | Apr-10 | | | | **352 UB** | **166 UB** | **1.10** | **9.08** | **132 UB** | **1420** | **186** | **2610** | **1.16** |
| | | Apr-11 | | | | **459** | **157** | **1.08** | **9.18** | **165** | **1120** | | **2440** | |
| | MW-68 | Apr-09 | | | | **239** | **186** | **1.80** | **3.81** | **142** | **1150** | **234** | **2290** | **3.32** |
| | | Sep-09 | | | | **379** | **381** | **1.61** | **4.63** | **221** | **1380** | **281** | **3200** | **9.38** |
| | | Apr-10 | | | | **275 UB** | **215 UB** | **1.87** | **4.12** | **180 UB** | **1200** | **307** | **2460** | **3.47** |
| | | Apr-11 | | | | **282** | **202** | **1.96** | **3.35** | **120** | **785** | | **2140** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Analyte Group:** | **Cyanide** | **Cations/Anions** | | | | | | **Water Quality** | | |
| | | | **Analyte:** | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | **Units:** | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | **CGWSL:** | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | **CGWSL Source:** | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | |
| TMD (continued) | MW-71 | Apr-10 | | | **572** | **714 UB** | **1.50** | **3.37** | **406 UB** | **2680** | **259** | **5850** | **42.9** |
| | | Oct-10 | | < 20.0 | **669 UB** | **759** | **1.29** | **3.81** | **448** | **3190** | | **5510** | **48.8** |
| | | Apr-11 | | < 20 | **452** | **798** | **1.34** | **2.77** | **352** | **2100** | | **5370** | |
| | | Apr-11 | FD | < 20 | **462** | **812** | **1.42** | **2.88** | **353** | **1880** | | **5140** | |
| | | Sep-11 | | < 20.0 | **584** | **869** | **1.33** | **3.52** | **378** | **2390** | | **5820** | |
| | MW-89 | Apr-09 | | | **536** | **419** | **2.31** | **8.33** | **188** | **3190** | **186** | **3040** | **0.550** |
| | | Sep-09 | | | **493** | **218** | **3.09** | **10.7** | **180** | **1630** | **199** | **3020** | < 1.00 |
| | | Apr-10 | FD | | **616** | **4310 J** | **0.840 J** | **22.7 J** | **2770 J** | **4640 J** | **278** | **10800 J** | < 0.500 |
| | | Apr-10 | | | **470** | **240 UJ** | **3.14 J** | **9.92 J** | **168 UJ** | **1740 J** | < 5.00 | **3320 J** | < 0.500 |
| | | Apr-11 | | | **521** | **180** | **1.98** | **9.35** | **158** | **1270** | | **2930** | |
| | NP-1 | Apr-09 | | | | | | | | | | | |
| | | Sep-09 | | | | | | | | | | | |
| | | Apr-10 | | | | **689 UB** | **1.94** | | | **2970** | **365** | **6260** | **30.2** |
| | | Oct-10 | | | | | | | | | | | |
| | | Apr-11 | | | **603** | **571** | **1.9** | **6.54** | **412** | **2270** | | **5210** | |
| | | Sep-11 | | | | | | | | | | | |
| | NP-6 | Apr-09 | | | **577** | **671** | **1.93** | **3.23** | **416** | **2640** | **313** | **5180** | **36.4** |
| | | Oct-09 | | | | **780** | **2.22** | | | **2710** | **278** | **6660** | **41.9** |
| | | Oct-10 | | | | | | | | | | | |
| | | Apr-11 | | | | | | | | | | | |
| N Refinery | MW-23 | Apr-09 | | | **112** | **467** | **0.592** | **1.30** | **433** | **15.9** | **1140** | **2040** | < 0.150 |
| | | Sep-09 | | | **73.1** | **555** | **1.06** | **1.24** | **454** | **29.7** | **1010** | **2270** | < 0.500 |
| | | Mar-10 | | | **106** | **507** | **1.46** | **1.24** | **452** | **37.1** | **1120** | **2220** | < 0.500 |
| | | Oct-10 | | | **89.2 UB** | **503** | **1.33** | **1.26** | **437** | **24.1** | | **2040** | **0.255** |
| | | Apr-11 | | | **82.6** | **502** | **1.16** | < 1 | **417** | **9.2** | | **2020** | |
| | | Sep-11 | | | **71.3** | **464** | **0.926** | **1.11** | **400** | **1.44** | | **2140** | |
| | MW-29 | Apr-09 | | | **440** | **398** | **1.97** | **3.18** | **415** | **1890** | **591** | **3900** | < 0.150 |
| | | Sep-09 | | | **397** | **454** | **1.69** | **3.35** | **386** | **2140** | **670** | **4780** | < 1.00 |
| | | Mar-10 | | | **371 UB** | **348 UB** | **2.23** | **5.40** | **335 UB** | **1760** | **637** | **3880** | < 0.500 |
| | | Oct-10 | | | **388** | **332** | **2.47** | **4.66** | **346** | **1670** | | **4010** | < 1.00 |
| | | Apr-11 | | | **381** | **376** | **1.48** | **2.98** | **430** | **1740** | | **3900** | |
| | | Sep-11 | | | **344** | **391** | **3.19** | **4.64** | **358** | **2300** | | **4540** | |
| | MW-30 | Mar-10 | | | **473 UB** | **416 UB** | **1.02** | **1.53** | **323** | **1930** | **521** | **4160** | **0.891** |
| | MW-40 | Mar-10 | | | **294 UB** | **123 UB** | **1.45** | **0.963** | **86.3** | **912** | **516** | **2120** | < 0.500 |
| | | Apr-11 | | | **284** | **164** | **1.46** | < 1 | **111** | **1000** | | **2200** | |
| | | Apr-11 | FD | | **281** | **174** | **1.42** | < 1 | **99.2** | **1040** | | **2090** | |
| | MW-41 | Apr-09 | | | **316** | **995** | **0.522** | **0.870** | **680** | **1250** | **1090** | **4430** | **1.08** |
| | | Sep-09 | | | **248** | **736** | **0.546** | **0.502** | **504** | **1210** | **1040** | **4070** | < 1.00 |
| | | Mar-10 | | | **234 UB** | **595 UB** | **0.667** | **0.486** | **450** | **1170** | **952** | **3590** | < 0.500 |
| | | Oct-10 | | | **312** | **875** | **0.73** | < 1.00 | **614** | **886** | | **3750** | < 1.00 |
| | | Apr-11 | | | **319** | **956** | **0.685** | < 1 | **709** | **1270** | | **4210** | |
| | | Sep-11 | | | **242** | **575** | **0.718** | < 1.00 | **495** | **1100** | | **3610** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| N Refinery (continued) | MW-42 | Apr-09 | | | | **203** | **693** | **0.502** | **0.682** | **392** | **991** | **875** | **3460** | < 0.150 |
| | | Apr-09 | FD | | | **210** | **641** | **0.595** | **0.743** | **410** | **874** | **1120** | **3400** | **1.07** |
| | | Sep-09 | | | | **237** | **750** | **0.605** | **0.462** | **425** | **979** | **1030** | **3680** | < 1.00 |
| | | Mar-10 | | | | **257 UB** | **278 UJ** | **0.655** | **0.469** | **453** | **359 UJ** | **1050** | **3380** | < 0.500 |
| | | Oct-10 | | | | **244** | **670** | **0.74** | < 1.00 | **419** | **730** | | **3420** | < 1.00 |
| | | Apr-11 | | | | **263** | **765** | **0.762** | < 1 | **500** | **867** | | **3370** | |
| | MW-43 | Apr-09 | | | | **99.6** | **652** | **0.624** | **0.508** | **632** | **140** | **1120** | **2290** | < 0.150 |
| | | Sep-09 | | | | **133** | **626** | **0.690** | **0.561** | **584** | **128** | **972** | **2280** | < 0.500 |
| | | Mar-10 | | | | **104 UB** | **623** | **0.958** | **0.456** | **597** | **65.8** | **1220** | **2420** | < 0.500 |
| | | Oct-10 | | | < 20.0 | **87.3** | **610** | **0.93** | < 1.00 | **627** | **39** | | **2220** | < 1.00 |
| | | Apr-11 | | | < 20 UJ | **139** | **598** | **0.772** | < 1 | **626** | **94.3** | | **2050** | |
| | | Sep-11 | | | < 20.0 | **95.8** | **594** | **0.719** | < 1.00 | **562** | **21.6** | | **2390** | |
| | MW-45 | Apr-09 | | | | **383** | **264** | **1.75** | **5.69** | **207** | **1690** | **304** | **3200** | < 0.500 |
| | | Sep-09 | | | | **445** | **343** | **2.00** | **4.59** | **228** | **1840** | **320** | **3850** | < 1.00 |
| | | Mar-10 | | | | **462 UB** | **353 UB** | **1.65** | **4.51** | **202** | **2060** | **436** | **4190** | < 0.500 |
| | | Nov-10 | | | < 20.0 | **487** | **377** | **1.96** | **4.54** | **212** | **1920** | | **4290** | < 10.0 |
| | | Nov-10 | FD | | < 20.0 | **540** | **368** | **1.82** | **5.15** | **235** | **1730** | | **4020** | < 10.0 |
| | | Apr-11 | | | < 20 UJ | **591** | **371** | **1.67** | **4.36** | **271** | **2160** | | **4090** | |
| | | Sep-11 | | | < 20.0 | **386** | **330** | **1.58** | **4.02** | **233** | **2070** | | **4070** | |
| | | Sep-11 | FD | | < 20.0 | **391** | **328** | **1.54** | **4.06** | **237** | **2110** | | **4070** | |
| | MW-46 | Nov-10 | | | | **800** | **357** | **2.02** | **13.7** | **182** | **2050** | | **4270** | < 10.0 |
| | MW-46R | Apr-11 | | | | **485** | **417** | **1.65** | **1.87** | **228** | **2290** | | **4250** | |
| | | Sep-11 | | | | **403** | **346** | **1.43** | < 1.00 | **184** | **2070** | | **4250** | |
| | MW-55 | Apr-09 | | | | **447** | **278** | **0.911** | **0.897** | **218** | **2140** | **313** | **4190** | **6.23** |
| | | Sep-09 | | | | **476** | **277** | **1.15** | **0.934** | **241** | **2480** | **280** | **4850** | **6.58** |
| | | Mar-10 | | | | **495 UB** | **243** | **1.71** | **0.764** | **193** | **2640** | **261** | **4760** | **10.8** |
| | | Oct-10 | | | < 20.0 | **530** | **130** | **2.48** | **1.15** | **156** | **2400** | | **4160** | **9.65** |
| | | Apr-11 | | | < 20 | **518** | **248** | **1.82** | < 1 | **238** | **3010** | | **4920** | |
| | | Sep-11 | | | < 20.0 | **370** | **312** | **1.64** | < 1.00 | **216** | **2630** | | **4950** | |
| | MW-56 | Apr-09 | | | | **524** | **329** | **0.750** | **2.09** | **217** | **1920** | **432** | **3940** | **0.619** |
| | | Sep-09 | | | | **504** | **337** | **0.854** | **1.99** | **190** | **1850** | **380** | **4030** | < 1.00 |
| | | Sep-09 | FD | | | **496** | **338** | **0.853** | **1.94** | **185** | **1830** | **390** | **4100** | < 1.00 |
| | | Mar-10 | | | | **442 UB** | **306 UB** | **0.863** | **1.84** | **187 UB** | **1790** | **416** | **3890** | < 0.500 |
| | | Oct-10 | | | | **511** | **360** | **1.1** | **2.08** | **207** | **1800** | | **3830** | < 1.00 |
| | | Apr-11 | | | | **488** | **350** | **1.07** | **1.98** | **235** | **2070** | | **4060** | |
| | | Apr-11 | FD | | | **475** | **356** | **1.07** | **1.83** | **226** | **2100** | | **3870** | |
| | | Sep-11 | | | | **370** | **311** | **0.863** | **1.61** | **170** | **1890** | | **4050** | |
| | MW-59 | Apr-10 | | | | **494** | **228 UB** | **0.984** | **0.605** | **140** | **1750** | **382** | **3420** | < 0.500 |
| | | Apr-11 | | | | **420** | **197** | **1.2** | < 1 | **149** | **1630** | | **3110** | |
| | MW-60 | Apr-10 | | | | **404 UB** | **316 UB** | **0.807** | **0.627** | **194** | **1750** | **704** | **3840** | < 0.500 |
| | | Nov-10 | | | < 20.0 | **383** | **289** | **0.381** | < 2.00 | **193** | **1460** | | **3380** | < 10.0 |
| | | Apr-11 | | | < 20 | **379** | **333** | **0.978** | < 1 | **206** | **1840** | | **3840** | |
| | | Sep-11 | | | < 20.0 | **344** | **282** | **0.809** | < 1.00 | **213** | **1690** | | **3740** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| N Refinery (continued) | MW-61 | Apr-09 | | | | **438** | **1190** | **0.703** | **0.846** | **382** | **1010** | **653** | **4670** | < 0.500 |
| | | Oct-09 | | | | | **1050** | **0.858** | | | **824** | **658** | **4320** | < 0.500 |
| | | Apr-10 | | | | **514** | **809 UB** | **1.08** | **0.628** | **575 UB** | **1440 UB** | **507** | **4440** | < 0.500 UJ |
| | | Oct-10 | | | | **395** | **700** | **1.14** | < 1.00 | **422** | **1220** | | **3700** | **0.140 J** |
| | | Apr-11 | | | | **378** | **736** | **0.871** | < 1 | **446** | **1350** | | **3780** | |
| | | Sep-11 | | | | **340** | **691** | **0.881** | < 1.00 | **412** | **1250** | | **3580** | |
| | MW-62 | Apr-09 | | | | **186** | **171** | **0.720** | **1.08** | **177** | **158** | **943** | **1600** | < 0.150 |
| | | Oct-09 | | | | | **201** | **0.888** | | | **105** | **806** | **1600** | < 0.500 |
| | | Apr-10 | | | | **237 UB** | **228** | **1.10** | **0.891** | **172 UB** | **164** | **835** | **1570** | < 0.500 |
| | | Oct-10 | | | | **250** | **234** | **1.13** | **1.01** | **140 UB** | **211** | | **1550** | **0.101** |
| | | Oct-10 | FD | | | **257** | **264** | **1.12** | **1.00** | **140 UB** | **217** | | **1590** | < 0.100 |
| | | Apr-11 | | | | **236** | **232** | **0.876** | < 1 | **141** | **198** | | **1670** | |
| | | Sep-11 | | | | **285** | **200** | **0.976** | < 1.00 | **124** | **348** | | **1890** | |
| | MW-67 | Apr-09 | | | | **177** | **238** | < 0.250 | **0.632** | **127** | **322** | **729** | **1590** | < 0.150 |
| | | Oct-09 | | | | | **202** | < 0.500 | | | **558** | **544** | **2030** | < 0.500 |
| | | Mar-10 | | | | **173 UB** | **243** | **0.432** | **0.602** | **134 UB** | **246** | **687** | **1520** | < 0.500 |
| | | Oct-10 | | | < 20.0 | **167** | **201** | **0.570** | < 1.00 | **147** | **197** | | **1350** | < 0.100 |
| | MW-90 | Apr-09 | | | | **283** | **114** | **1.31** | **1.69** | **311** | **1640** | **567** | **3770** | < 0.150 |
| | | Oct-09 | | | | | **98.9** | **1.27** | | | **1500** | **603** | **3420** | < 0.500 |
| | | Mar-10 | | | | **245 UB** | **117 UB** | **1.31** | **1.10** | **220 UB** | **1430** | **612** | **2960** | < 0.500 |
| | | Oct-10 | | | | **288** | **111** | **1.56** | **1.37 UB** | **280** | **1330** | | **2980** | < 0.10 |
| | | Apr-11 | | | | **274** | **119** | **1.04** | < 1 | **185** | **1120** | | **2510** | |
| | | Sep-11 | | | | **256** | **138** | **0.850** | < 1.00 | **142** | **995** | | **2520** | |
| | | Sep-11 | FD | | | **216** | **150** | **0.968** | < 1.00 | **143** | **1030** | | **2530** | |
| | MW-91 | Apr-09 | | | | **241** | **48.8** | **0.625** | **0.523** | **51.3** | **535** | **713** | **1820** | < 0.150 |
| | | Oct-09 | | | | | **20.1** | **1.12** | | | **790** | **722** | **2250** | **0.562** |
| | | Mar-10 | | | | **324 UB** | **13.4 UB** | **1.24** | **0.332** | **33.3** | **664** | **787** | **2040** | < 0.500 |
| | | Oct-10 | | | | **323** | **17.9** | **1.39** | < 1.00 | **39.2 UB** | **581** | | **1890** | **0.11** |
| | | Apr-11 | | | | **304** | **19.4** | **1.19** | < 1 | **39.7** | **517** | | **1760** | |
| | | Sep-11 | | | | **151** | **18.8** | **1.04** | < 1.00 | **30.7** | **145** | | **1120** | |
| | MW-92 | Apr-09 | | | | **172** | **401** | **0.549** | **0.590** | **325** | **310** | **970** | **2280** | < 0.150 |
| | | Oct-09 | | | | | **603** | **0.871** | | | **40.0** | **1100** | **2260** | < 0.100 |
| | | Mar-10 | | | | **119 UB** | **488** | **0.997** | **1.11** | **377 UB** | **64.8** | **1150** | **2190** | < 0.500 |
| | MW-93 | Apr-09 | | | | **329** | **60.1** | **1.26** | **4.55** | **90.3** | **817** | **529** | **2000** | < 0.500 |
| | | Oct-09 | | | | | **46.7** | **1.32** | | | **709** | **480** | **1920** | < 0.500 |
| | | Mar-10 | | | | **378 UB** | **47.9 J** | **1.64 J** | **2.28 J** | **81.8 J** | **847 J** | **642** | **2180 J** | < 0.500 |
| | | Mar-10 | FD | | | **451 UB** | **572 J** | **2.41 J** | **5.11 J** | **379 UJ** | **3350 J** | **531** | **6530 J** | < 0.500 |
| | | Oct-10 | | | | **355** | **42.3** | **1.55** | **2.46 UB** | **88.8** | **686** | | **1740** | **0.14 J** |
| | | Apr-11 | | | | **281** | **36.3** | **1.35** | **1.7** | **81.7** | **379** | | **1600** | |
| | | Sep-11 | | | | **295** | **36.5** | **1.16** | **2.36** | **80.0** | **526** | | **1780** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| N Refinery (continued) | MW-95 | Apr-09 | | | | **240** | **261** | < 0.500 | **0.446** | **112** | **477** | **669** | **1980** | < 0.150 |
| | | Oct-09 | | | | | **235** | **0.657** | | | **488** | **643** | **2060** | < 0.500 |
| | | Mar-10 | | | | **219 UB** | **263** | **0.631** | **0.559** | **142 UB** | **302** | **697** | **1760** | < 0.500 |
| | | Apr-11 | | | | **209** | **269** | **0.558** | < 1 | **138** | **194** | | **1710** | |
| | MW-96 | Apr-09 | | | | **164** | **248** | **0.667** | **0.829** | **214** | **308** | **839** | **1880** | < 0.150 |
| | | Apr-09 | FD | | | **166** | **242** | **0.630** | **0.780** | **214** | **337** | **854** | **1830** | < 0.150 |
| | | Oct-09 | | | | | **222** | **1.04** | | | **243** | **757** | **1790** | **0.633** |
| | | Oct-09 | FD | | | | **220** | **0.791** | | | **242** | **801** | **1710** | < 0.500 |
| | | Mar-10 | | | | **178 UB** | **149 UB** | **0.951** | **1.01** | **225 UB** | **422** | **827** | **1900** | < 0.500 |
| | | Oct-10 | | | | **187** | **133** | **1.18** | **1.14 UB** | **236** | **359** | | **1730** | **0.24** |
| | | Apr-11 | | | | **189** | **138** | **0.902** | < 1 | **228** | **353** | | **1710** | |
| | | Sep-11 | | | | **132** | **145** | **0.651** | < 1.00 | **186** | **239** | | **1700** | |
| | MW-98 | Apr-09 | | | | **294** | **18.3** | **0.730** | < 0.400 | **72.9** | **1610** | **320** | **2860** | < 0.150 |
| | | Sep-09 | | | | **419** | **55.4** | **1.64** | **0.214** | **77.0** | **2040** | **518** | **3810** | < 0.500 |
| | | Apr-10 | | | | **509** | **59.1** | **1.64** | < 0.400 | **90.5 UB** | **1950** | **567** | **3760** | < 0.500 |
| | | Oct-10 | | | | **397** | **54.8** | **1.43** | < 1.00 | **70.3 UB** | **1540** | | **3160** | < 0.100 |
| | | Apr-11 | | | | **381** | **89.4** | **1.59** | < 1 | **77.4** | **1940** | | **3550** | |
| | | Sep-11 | | | | **343** | **97.6** | **1.51** | < 1.00 | **65.8** | **1790** | | **3700** | |
| | RW-1 | Apr-09 | | | | **300** | **312** | **0.573** | **1.84** | **290** | **736** | **820** | **2670** | < 0.150 |
| | | Oct-09 | | | | | **324** | **0.597** | | | **671** | **742** | **2510** | < 0.500 |
| | | Nov-10 | | | | **470** | **296** | **0.755** | **3.71** | **275** | **905** | | **3270** | < 10.0 |
| | RW-2 | Nov-10 | | | | **243** | **271** | **0.966** | **2.07** | **245** | **34.3** | | **2100** | < 10.0 |
| | RW-7 | Apr-10 | | | | **164** | **280** | **0.709** | **0.893** | **131** | **164** | **814** | **1600** | < 0.500 |
| | RW-9 | Apr-10 | | | | **240 UB** | **296 UB** | **1.22** | **2.18** | **361** | **878** | **784** | **2510** | < 0.500 |
| | | Apr-10 | FD | | | **193 UB** | **251 UB** | **1.33** | **2.19** | **288** | **750** | **694** | **2470** | < 0.500 |
| | | Apr-11 | | | | | | | | | | | | |
| | | Apr-11 | | | | **303** | **397** | **1.22** | **1.95** | **388** | **521** | | **2490** | |
| | RW-10 | Apr-10 | | | | **293 UB** | **183 UB** | **2.74** | **5.98** | **200** | **1430** | **201** | **2890** | < 0.500 |
| | | Apr-11 | | | | **367** | **192** | **2.44** | **5.91** | **251** | **1640** | | **2910** | |
| | | Apr-11 | FD | | | **345** | **194** | **2.41** | **5.72** | **244** | **1670** | | **2930** | |
| | RW-16A | Mar-10 | | | | **483 UB** | **535** | **4.92** | **1.27** | **508** | **3000** | **526** | **6410** | **1.46** |
| S Refinery | KWB-2R | Oct-10 | | | | **113** | **363** | **1.73** | < 2.00 | **292** | **13.2** | | **1580** | < 0.100 UJ |
| | | Apr-11 | | | | **302** | **222** | **0.623** | < 1 | **337** | **687** | | **2810** | |
| | MW-28 | Apr-09 | | | | **251** | **179** | **0.919** | **0.484** | **99.8** | **567** | **858** | **2090** | < 0.150 |
| | | Sep-09 | | | | **228** | **182** | **1.10** | **0.380** | **102** | **460** | **760** | **1830** | < 1.00 |
| | | Apr-10 | | | | **255 UB** | **182 UB** | **1.01** | **0.716** | **112** | **614** | **764** | **2150** | < 0.500 |
| | | Oct-10 | | **45.0** | | **292** | **230 J** | **1.1 J** | **1.20 J** | **86.4 UB** | **740** | | **2560 J** | < 1.00 |
| | | Apr-11 | | < 20 | | **262** | **185** | **1.01** | **2.32** | **108** | **902** | | **2390** | |
| | | Sep-11 | | < 20.0 | | **247** | **167** | **0.800** | **2.07** | **88.0** | **789** | | **2420** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| S Refinery (continued) | MW-49 | Apr-09 | | | | **216** | **541** | **0.977** | **2.12** | **298** | **358** | **703** | **2310** | **1.07** |
| | | Apr-10 | | | | **184 UB** | **464** | **1.24** | **2.55** | **278** | **329** | **754** | **2170** | < 0.500 |
| | | Oct-10 | | < 20.0 | | **166** | **416** | **1.36** | **2.17** | **260** | **288** | | **1940** | < 0.100 |
| | | Apr-11 | | < 20 | | **186** | **416** | **1.26** | **2.29** | **317** | **380** | | **2060** | |
| | | Sep-11 | | < 20.0 | | **152** | **360** | **1.08** | **2.10** | **253** | **305** | | **2030** | |
| | | Sep-11 | FD | < 20.0 | | **148** | **342** | **1.15** | **2.01** | **250** | **280** | | **1990** | |
| | MW-50 | Apr-09 | | | | **374** | **170** | **0.583** | **2.11** | **116** | **1290** | **304** | **2700** | < 0.500 |
| | | Sep-09 | | | | **373** | **167** | **0.863** | **2.37** | **114** | **1310** | **311** | **2690** | **0.565** |
| | | Sep-09 | FD | | | **408** | **167** | **0.723** | **2.47** | **121** | **1280** | **316** | **2730** | < 0.500 |
| | | Apr-10 | | | | **489** | **170 UB** | **0.828** | **2.19** | **159 UB** | **1420 UB** | **338** | **2750** | < 0.500 |
| | | Nov-10 | | | | **337** | **156** | **0.840** | **2.23** | **112** | **1230** | | **2510** | < 10.0 |
| | | Apr-11 | | | | **339** | **155** | **0.879** | **2.29** | **123** | **1450** | | **2540** | |
| | | Sep-11 | | | | **329** | **141** | **0.570** | **1.82** | **102** | **1340** | | **2570** | |
| | MW-52 | Apr-09 | | | | **190** | **261** | **1.40** | < 0.400 | **342** | **1060** | **616** | **2600** | **2.24** |
| | | Sep-09 | | | | **165** | **180** | **1.42** | **0.328** | **314** | **1030** | **552** | **2330** | **2.18** |
| | | Sep-09 | FD | | | **191** | **181** | **1.71** | **0.316** | **361** | **1020** | **538** | **2500** | **2.11** |
| | | Apr-10 | | | | **215 UB** | **221 UB** | **1.67** | < 1.00 | **366 UB** | **1080** | **517** | **2750** | **3.08** |
| | | Oct-10 | | < 20.0 | | **160** | **159** | **1.76** | < 2.00 | **284** | **849** | | **2220** | **1.15** |
| | | Apr-11 | | < 20 | | **191** | **228** | **1.76** | < 1 | **337** | **997** | | **2410** | |
| | | Sep-11 | | < 20.0 | | **160** | **173** | **1.39** | < 1.00 | **305** | **973** | | **2140** | |
| | | Sep-11 | FD | < 20.0 | | **153** | **179** | **1.43** | < 1.00 | **284** | **982** | | **2140** | |
| | MW-57 | Nov-10 | | | | **679** | **1380** | **2.78** | **3.02** | **924** | **3410** | | **8720** | < 10.0 |
| | | Apr-11 | | | | **438** | **549** | **1.67** | < 1 | **468** | **1310** | | **4440** | |
| | | Sep-11 | | | | **636** | **636** | **3.58** | **2.57** | **916** | **4750** | | **3580** | |
| | MW-58 | Apr-09 | | | | **214** | **327** | **0.701** | < 0.20 | **102** | **209** | **770** | **1610** | < 0.150 |
| | | Sep-09 | | | | **222** | **317** | **1.11** | **0.281** | **105** | **95.9** | **794** | **1500** | < 0.500 |
| | | Apr-10 | | | | **210 UB** | **303** | **0.933** | < 1.00 | **84.2 UB** | **157 J** | **756** | **1710** | < 0.500 |
| | | Apr-10 | FD | | | **195 UB** | **260** | **0.998** | < 1.00 | **83.0 UB** | **90.9 J** | **776** | **1510** | < 0.500 |
| | | Oct-10 | | < 20.0 | | **217** | **282** | **0.977** | < 2.00 | **80.3** | < 0.500 | | **1300** | < 0.100 |
| | | Apr-11 | | < 20 | | **243** | **248** | **0.813** | < 1 | **128** | **96.1** | | **1730** | |
| | | Sep-11 | | < 20.0 | | **218** | **343** | **0.724** | < 1.00 | **120** | **177** | | **1630** | |
| | MW-66 | Apr-09 | | | | **153** | **238** | **0.901** | **1.09** | **191** | **6.21** | **883** | **1230** | < 0.150 |
| | | Sep-09 | | | | **136** | **231** | **1.05** | **0.740** | **177** | **6.96** | **750** | **1230** | < 0.100 |
| | | Apr-10 | | | | **142 UB** | **216** | **1.04** | **0.920** | **180** | **3.59 UB** | **864** | **1340** | < 0.500 |
| | | Oct-10 | | < 20.0 | | **119** | **200** | **1.2** | **1.80** | **149 UB** | **1.1** | | **1010** | < 1.00 |
| | | Apr-11 | | < 20 | | **137** | **252** | **1.19** | < 1 | **192** | **2.82** | | **1220** | |
| | | Apr-11 | FD | < 20 | | **142** | **231** | **1.1** | < 1 | **189** | **2.37** | | **1250** | |
| | | Sep-11 | | < 20.0 | | **116** | **192** | **0.625** | **1.20** | **150** | **12.5** | | **966** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| S Refinery (continued) | MW-99 | Apr-09 | | | | **177** | **248** | < 0.500 | **0.594** | **133** | **218** | **616** | **1390** | < 0.150 |
| | | Sep-09 | | | | **190** | **249** | < 0.500 | **0.570** | **206** | **205** | **774** | **1680** | < 0.500 |
| | | Apr-10 | | | | **183 UB** | **268** | **0.534** | **0.632** | **200** | **236** | **804** | **1790** | < 0.500 |
| | | Oct-10 | | | | **187** | **290** | **0.58** | < 1.00 | **192** | **200** | | **1510** | < 1.00 |
| | | Apr-11 | | | | **189** | **286** | **0.578** | < 1 | **221** | **262** | | **1570** | |
| | | Sep-11 | | | | **159** | **262** | **0.550** | < 1.00 | **205** | **139** | | **1430** | |
| | MW-101 | Apr-09 | | | | **171** | **289** | < 0.500 | **0.581** | **180** | **229** | **718** | **1680** | < 0.150 |
| | | Sep-09 | | | | **196** | **241** | **0.847** | **0.614** | **147** | **212** | **617** | **1440** | < 0.500 |
| | | Apr-10 | | | | **186 UB** | **244** | **0.658** | **0.649** | **154** | **195** | **663** | **1430** | < 0.500 |
| | | Nov-10 | | | | **172** | **271** | **0.734** | < 1.00 | **139** | **187** | | **1320** | < 10.0 |
| | | Apr-11 | | | | **202** | **246** | **0.67** | < 1 | **151** | **127** | | **1420** | |
| | | Sep-11 | | | | **175** | **233** | **0.697** | < 1.00 | **141** | **175** | | **1390** | |
| | MW-103 | Mar-09 | | | | **12.1** | **919** | **12.0** | **1.15** | **1050** | **42.5** | **1020** | **2710** | < 1.00 |
| | | Sep-09 | | | | **13.4** | **819** | **11.7** | **0.920** | **1010** | **39.8** | **1060** | **2700** | < 0.500 |
| | | Apr-10 | | | | **12.3** | **817** | **12.4** | **0.729** | **974** | **12.1 UJ** | **1380** | **3070** | < 0.500 |
| | | Apr-11 | | | | **12.6** | **726** | **10.1** | < 1 | **1180** | **25.6** | | **2770** | |
| | MW-104 | Mar-09 | | | | **208** | **64.8** | **2.91** | **5.01** | **38.3** | **620** | **139** | **1180** | < 1.00 |
| | | Sep-09 | | | | **291** | **74.1** | **2.33** | **6.69** | **61.4** | **730** | **202** | **1560** | < 0.500 |
| | | Apr-10 | | | | **151** | **26.9** | **2.53** | **4.55** | **31.9** | **436** | **148** | **874** | < 0.500 |
| | | Oct-10 | | | | **264** | **87** | **2.0 J** | **7.07** | **46.5 UB** | **620** | | **1500** | < 1.00 |
| | | Oct-10 | FD | | | **262** | **96.6 J** | **2.03 J** | **7.25 J** | **48.5 UB** | **691** | | **1500 J** | < 1.00 |
| | | Apr-11 | | | | **296** | **60.3** | **1.68** | **7.38** | **66.6** | **938** | | **1660** | |
| | | Sep-11 | | | | **336** | **81.5** | **2.31** | **7.18** | **66.0** | **1320** | | **2130** | |
| | | Sep-11 | FD | | | **348** | **82.5** | **2.35** | **7.50** | **66.8** | **1320** | | **2120** | |
| | MW-106 | Sep-09 | | | | **416** | **83.2** | **0.989** | **2.46** | **194** | **1880** | **508** | **3680** | **0.507** |
| | | Apr-10 | | | | **366 UB** | **36.6** | **0.919** | **1.70** | **146** | **1640** | **452** | **3270** | < 0.500 |
| | | Oct-10 | | | | **365** | **54.3** | **0.956** | < 1.00 | **196** | **1460** | | **3400** | < 10.0 |
| | | Apr-11 | | | | **400** | **51.1** | **0.968** | < 1 | **185** | **1650** | | **3210** | |
| | | Sep-11 | | | | **350** | **67.2** | **0.955** | **1.08** | **159** | **1630** | | **3350** | |
| | MW-107 | Sep-09 | | | | **161** | **306** | **0.918** | **1.77** | **68.7** | < 2.50 | **730** | **1570** | < 0.500 |
| | | Mar-10 | | | | **128** | **253** | **1.23** | **0.989** | **61.9** | **0.813** | **727** | **1270** | < 0.500 |
| | | Nov-10 | | | | **111** | **272** | **1.20** | **1.15** | **61.2** | **1.03** | | **1160** | < 1.00 |
| | | Apr-11 | | | | **122** | **281** | **1.41** | < 1 | **63.2** | **1.21** | | **1160** | |
| | | Sep-11 | | | | **135** | **279** | **1.36** | < 1.00 | **63.3** | **1.66** | | **1190** | |
| | MW-109 | Jan-11 | | | | | | | | | | | | |
| | | Jan-11 | FD | | | | | | | | | | | |
| | | Apr-11 | | | | **229** | **596** | **1.26** | < 1 | **540** | **312** | | **1860** | |
| | | Sep-11 | | | | **86.7** | **540** | **1.07** | < 1.00 | **516** | **244** | | **2070** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | Analyte Group: | Cyanide | Cations/Anions | | | | | | Water Quality | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Analyte: | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | | Units: | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | | CGWSL: | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | | CGWSL Source: | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | | |
| S Refinery (continued) | MW-110 | Jan-11 | | | | | | | | | | | | |
| | | Apr-11 | | | | **210** | **198** | **1.29** | **1.11** | **293** | **249** | | **1410** | |
| | | Sep-11 | | | | **118** | **179** | **0.990** | < 1.00 | **291** | **498** | | **1580** | |
| | RW-4 | Apr-10 | | | | **178** | **297** | **0.667** | **1.41** | **171** | **404** | **613** | **1780** | < 0.500 |
| | | Apr-11 | | | | **194** | **343** | **0.602** | **1.58** | **198** | **386** | | **1820** | |
| | RA-313 | Oct-09 | | | | | **15.2** | **0.711** | | | **429** | **184** | **976** | **1.14** |
| | | Apr-10 | | | | **207 UB** | **33.6** | **0.698** | **0.965** | **21.3 UB** | **494** | **199** | **1100** | < 0.500 |
| | | Apr-10 | FD | | | **215 UB** | **34.3** | **0.698** | **1.11** | **22.8 UB** | **496** | **189** | **1030** | **0.992** |
| | | Apr-11 | | | | **174** | **29.2** | **0.722** | **0.989** | **19.7** | **436** | | **932** | |
| | RA-1227 | Nov-10 | | | | | **135** | **0.373** | | | **1340** | | **2880** | < 10.0 |
| | | Nov-10 | FD | | | | **140** | **0.344** | | | **1340** | | **2520** | < 10.0 |
| | | Apr-11 | | | | **370** | **130** | **0.318** | **1.81** | **115** | **1480** | | **2800** | |
| Field E of Refinery | KWB-1A | Apr-09 | | | | **385** | **210** | **0.784** | **1.02** | **170** | **1890** | **365** | **3610** | < 0.500 |
| | | Sep-09 | | | | **382** | **198** | **0.955** | **0.969** | **168** | **1850** | **409** | **3570** | **0.709** |
| | | Apr-10 | | | | **355 UB** | **223 UB** | **1.11** | **1.07** | **149 UB** | **1950** | **421** | **3840** | < 0.500 |
| | | Oct-10 | | | < 20.0 | **409 UB** | **220** | **1.15** | **0.996** | **155** | **1490 J** | | **3150** | < 0.100 |
| | | Oct-10 | FD | | < 20.0 | **434 UB** | **248** | **1.18** | **1.07** | **170** | **1660** | | **3730** | < 0.100 |
| | | Apr-11 | | | < 20 | **519** | **301** | **1.09** | **1.46** | **175** | **1580** | | **3840** | |
| | | Sep-11 | | | < 20.0 | **351** | **314** | **1.19** | < 1.00 | **136** | **2080** | | **3960** | |
| | KWB-3AR | Apr-09 | | | | **601** | **176** | < 0.250 | **1.05** | **329** | **2780** | **379** | **5270** | **12.1** |
| | | Apr-10 | | | | **615** | **292 UB** | **0.284** | **0.938** | **467 UB** | **3200** | **373** | **5340** | **18.0** |
| | | Oct-10 | | | < 20.0 | **532** | **216** | **0.511** | < 2.00 | **428** | **2810** | | **5230** | **8.78** |
| | | Oct-10 | FD | | < 20.0 | **502** | **237 J** | **0.501** | < 2.00 | **434 J** | **2720** | | **4870** | **9.14 J** |
| | | Apr-11 | | | < 20 | **635** | **158** | **0.469** | < 1 | **442** | **2360** | | **2340** | |
| | KWB-7 | Apr-09 | | | | **313** | **474** | < 0.500 | **1.25** | **229** | **860** | **630** | **2940** | **5.74** |
| | | Oct-09 | | | | | **517** | **0.789** | | | **1010** | **686** | **3130** | **7.15** |
| | | Apr-10 | | | | **273 UB** | **419 UB** | **0.771** | **0.558** | **228 UB** | **895 UB** | **769** | **2820** | **1.27** |
| | | Oct-10 | | | < 20.0 | **323** | **468** | **0.870** | < 2.00 | **230** | **830** | | **2940** | **0.518** |
| | | Apr-11 | | | < 20 | **311** | **406** | **0.75** | < 2 | **185** | **995** | | **2830** | |
| | | Sep-11 | | | < 20.0 | **352** | **486** | **0.627** | **1.12** | **254** | **957** | | **3040** | |
| | KWB-9 | Apr-09 | | | | **433** | **205** | < 0.250 | **0.812** | **141** | **1370** | **482** | **2990** | **0.564** |
| | | Sep-09 | | | | **408** | **242** | < 0.500 | **0.791** | **137** | **1450** | **424** | **3070** | **1.17** |
| | | Apr-10 | | | | **532** | **269 UB** | **0.198** | < 1.00 | **180 UB** | **1570** | **438** | **3540** | **1.65** |
| | | Oct-10 | | | < 20.0 | **473** | **259** | **0.358** | < 2.00 | **151** | **1510** | | **3140** | **0.508** |
| | | Apr-11 | | | < 20 | **524** | **178** | **0.349** | < 1 | **179** | **1350** | | **3570** | |
| | KWB-11A | Apr-09 | | | | **389** | **864** | < 0.500 | **1.67** | **269** | **814** | **466** | **3510** | **30.1** |
| | | Oct-09 | | | | | **890** | **0.840** | | | **954** | **477** | **3940** | **33.7** |
| | | Apr-10 | | | | **404 UB** | **909** | **0.633** | < 1.00 | **319 UB** | **879 UB** | **555** | **3740** | **27.4** |
| | | Oct-10 | | | < 20.0 | **541 UB** | **960** | **1.01** | **0.603** | **364** | **903** | | **4020** | **26.9** |
| | | Apr-11 | | | < 20 | **443** | **757** | **0.78** | < 1 | **310** | **678** | | **3420** | |
| | | Sep-11 | | | < 20.0 | **426** | **903** | **0.925** | < 1.00 | **280** | **933** | | **3810** | |
| | | Sep-11 | FD | | < 20.0 | **441** | **910** | **0.640** | **1.26** | **288** | **924** | | **3780** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Analyte Group:** | **Cyanide** | **Cations/Anions** | | | | | | **Water Quality** | | |
| | | | **Analyte:** | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | **Units:** | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | **CGWSL:** | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | **CGWSL Source:** | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | |
| Field E of Refinery (continued) | KWB-11B | Oct-10 | | < 20.0 | **409** | **288** | **0.483** | **3.11** | **81.5** | **1180** | | **2690** | **1.26** |
| | | Apr-11 | | < 20 | **456** | **352** | **0.366** | **2.93** | **90.9** | **1300** | | **2750** | |
| | | Sep-11 | | < 20.0 | **276** | **280** | **0.292** | **2.83** | **68.6** | **1140** | | **2680** | |
| | KWB-12A | Sep-09 | | | **500** | **130** | < 0.500 | **0.716** | **138** | **2290** | **281** | **4010** | **5.47** |
| | | Oct-10 | | < 20.0 | **541** | **126** | **0.447 J** | < 2.00 | **134** | **2200** | | **3740** | **5.61 J** |
| | | Sep-11 | | < 20.0 | **566** | **129** | **0.225** | **0.794** | **154** | **2290** | | **9810** | |
| | KWB-12B | Oct-10 | | < 20.0 | **538** | **116 J** | **0.305** | < 2.00 | **140 J** | **2090** | | **3760** | **4.42 J** |
| | | Apr-11 | | < 20 | **638** | **72.2** | **1.15** | < 1 | **175** | **1700** | | **4170** | |
| | | Sep-11 | | < 20.0 | **512** | **113** | < 0.200 | **0.544** | **127** | **2280** | | **3780** | |
| | | Sep-11 | FD | < 20.0 | **552** | **112** | < 0.200 | **0.550** | **136** | **2200** | | **3850** | |
| | RW-11-1 | Nov-10 | | | **398** | **189** | **0.605** | **6.06** | **73.0** | **766** | | **2660** | < 10.0 |
| | RW-18 | Apr-09 | | | **509** | **321** | **1.98** | **0.864** | **231** | **3140** | **255** | **5520** | **1.07** |
| | | Sep-09 | | | **522** | **309** | **1.93** | **1.19** | **214** | **2920** | **296** | | **1.53** |
| | | Apr-10 | | | **413 UB** | **362 UB** | **2.30** | **0.950** | **188 UB** | **3190** | **311** | **5480** | **0.822** |
| | RA-4196 | Apr-09 | | | **377** | **875** | < 0.250 | **2.89** | **419** | **1230** | **157** | **3370** | < 0.150 |
| | | Sep-09 | | | **425** | **329** | < 0.500 | **2.39** | **158** | **1280** | **197** | **2770** | < 0.500 |
| | | Apr-10 | | | **412 UB** | **187 UB** | **0.115** | **2.36** | **121 UB** | **1120** | **213** | **2400** | < 0.500 |
| | | Nov-10 | | | | **201** | **0.274** | | | **1150** | | **2440** | < 10.0 |
| | | Apr-11 | | | **291** | **173** | **0.301** | **2.2** | **113** | **1010** | | **2050** | |
| | | Apr-11 | FD | | **300** | **198** | **0.311** | **2.08** | **106** | **1080** | | **2250** | |
| | | Sep-11 | | | **307** | **136** | < 0.200 | **1.95** | **75.4** | **1200** | | **2200** | |
| | | Sep-11 | FD | | **307** | **132** | < 0.200 | **1.88** | **73.9** | **1210** | | **2220** | |
| | RA-4798 | Apr-09 | | | **238** | **70.0** | < 0.250 | **2.02** | **44.7** | **768** | **128** | **1460** | < 0.500 |
| | | Sep-09 | | | **457** | **165** | < 0.500 | **2.34** | **127** | **1560** | **286** | **3000** | **0.758** |
| | | Apr-10 | | | **283 UB** | **73.0** | **0.154** | **1.74** | **47.8 UB** | **842** | **179** | **1740** | **1.20** |
| | | Nov-10 | | | | **139** | **0.251** | | | **1210** | | **2460** | < 10.0 |
| | | Apr-11 | | | **210** | **67.1** | **0.293** | **1.83** | **44.2** | **726** | | **1460** | |
| | | Sep-11 | | | **259** | **73.8** | < 0.200 | **1.75** | **50.1** | **835** | | **1870** | |
| Crossgradient | KWB-13 | Apr-09 | | | **496** | **181** | < 0.500 | **1.02** | **154** | **1760** | **255** | **3270** | **13.0** |
| | | Apr-09 | FD | | **505** | **181** | < 0.500 | **1.25** | **124** | **1760** | **282** | **3370** | **13.8** |
| | | Sep-09 | | | **491** | **157** | **0.501** | **0.934** | **147** | **1710** | **286** | **3500** | **14.4** |
| | | Apr-10 | | | **431 UB** | **158 UB** | **0.582** | **1.40** | **139 UB** | **1900** | **294** | **3540** | **14.5** |
| | | Apr-11 | | < 20 | **608** | **147** | **0.619** | **2.24** | **198** | **1630** | | **3320** | |
| | NP-5 | Apr-09 | | | **527** | **171** | **2.62** | **0.441** | **516** | **4470** | **289** | **6930** | < 0.150 |
| | | Oct-09 | | | | **164** | **2.70** | | | **3980** | **258** | **6690** | **5.75** |
| | | Apr-10 | | | **521** | **216 UB** | **2.77** | < 1.00 | **452 UB** | **3860** | **249** | **6050** | **6.39** |
| | | Apr-11 | | | **500** | **273** | **2.79** | < 1 | **352** | **3010** | | **5350** | |
| | RA-3156 | Apr-09 | | | **454** | **218** | < 0.250 | **2.54** | **140** | **1490** | **231** | **2880** | **5.28** |
| | | Apr-10 | | | **555** | **209 UB** | < 0.100 | **2.32** | **171 UB** | **1570** | **239** | **3070** | **5.12** |
| | | Nov-10 | | | | **215** | **0.235** | | | **1460** | | **3120** | < 10.0 |
| | | Apr-11 | | | **409** | **207** | **0.224** | **2.13** | **154** | **1510** | | **2840** | |
| | | Sep-11 | | | **428** | **242** | < 0.200 | **2.35** | **136** | **1730** | | **3260** | |

# Table 4 - Summary of Groundwater Analytical Data

## 2011 Groundwater Report

## Navajo Refinery, Artesia, New Mexico

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Analyte Group:** | **Cyanide** | **Cations/Anions** | | | | | | **Water Quality** | | |
| | | | **Analyte:** | Cyanide | Calcium | Chloride | Fluoride | Potassium | Sodium | Sulfate | Alkalinity, Total | Total Dissolved Solids | Nitrogen |
| | | | **Units:** | ug/l | mg/L | mg/L | mg/L | mg/l | mg/L | mg/L | mg/L | mg/l | mg/l |
| | | | **CGWSL:** | 200 | | 250 | 1.6 | | | 600 | | 1000 | |
| | | | **CGWSL Source:** | EPA MCL | | WQCC Dom | WQCC HH | | | WQCC Dom | | WQCC Dom | |
| **Area** | **Location** | **Date** | **Dup** | | | | | | | | | | |
| Upgradient | MW-53 | Apr-09 | | | **330** | **119** | **0.848** | **1.07** | **98.1** | **1250** | **265** | **2370** | **0.507** |
| | | Oct-09 | | | | **135** | **0.990** | | | **1290** | **223** | **2460** | **2.27** |
| | | Apr-10 | | | **290 UB** | **109 UB** | **0.870** | < 1.00 | **85.8 UB** | **1330** | **239** | **2390 J** | < 0.500 |
| | | Apr-10 | FD | | **350 UB** | **108 UB** | **0.851** | < 1.00 | **106 UB** | **1310** | **199** | **902 J** | < 0.500 |
| | | Apr-11 | | | **332** | **146** | **0.573** | **1.1** | **116** | **875** | | **1920** | |
| | UG-1 | Apr-09 | | | **907** | **177** | < 0.500 | **7.06** | **70.5** | **1900** | **1330** | **3410** | **5.54** |
| | | Oct-09 | | | | **166** | **0.691** | | | **1810** | **252** | **3450** | **7.21** |
| | | Apr-10 | | | **530 UB** | **159 UB** | **0.627** | **1.69** | **87.6 UB** | **1820** | **219** | **3410** | **7.36** |
| | | Oct-10 | | < 20.0 | **494** | **151** | **0.680** | < 2.00 | **78.8** | **1590** | | **3060** | **6.61** |
| | | Mar-11 | | < 20 | **487** | **108** | **0.712** | **2.38** | **91.8** | **1300** | | **3260** | |
| | UG-2 | Apr-09 | | | **374** | **62.1** | **1.25** | **4.61** | **75.9** | **1010** | **120** | **1940** | **1.70** |
| | | Oct-09 | | | | **53.0** | **1.30** | | | **961** | **247** | **1900** | **2.56** |
| | | Apr-10 | | | **267 UB** | **44.0** | **1.34** | **3.05** | **71.0 UB** | **910** | **249** | **1900** | **2.44** |
| | | Oct-10 | | < 20.0 | **263** | **45.4** | **1.34 J** | **2.46** | **71.1** | **809** | | **1740** | **1.90** |
| | | Mar-11 | | < 20 | **270** | **42** | **1.32** | **2.83** | **82.1** | **689** | | **1690** | |
| | UG-3R | Apr-09 | | | **434** | **62.9** | < 0.250 | **4.06** | **63.3** | **1390** | **379** | **2590** | **4.96** |
| | | Oct-09 | | | | **68.0** | **0.565** | | | **1330** | **208** | **2520** | **5.38** |
| | | Apr-10 | | | **464** | **59.6** | **0.372** | **2.10** | **79.4 UB** | **1360** | **209** | **2470** | **6.28** |
| | | Oct-10 | | < 20.0 | **359** | **46** | **0.50 J** | **1.82** | **49.3 UB** | **1100** | | **2170** | **1.97** |
| | | Mar-11 | | < 20 | **335** | **26.8** | **0.492** | **2.4** | **55.6** | **834** | | **1830** | |
| | | Mar-11 | FD | < 20 | **330** | **26.8** | **0.486** | **2.08** | **53.2** | **765** | | **1860** | |

# Table 4 - Summary of Groundwater Analytical Data
## 2011 Groundwater Report
## Navajo Refinery, Artesia, New Mexico

| Abbreviation | Definition |
|---|---|
| **X** | Reported concentration equal to X was above the CGWSL. |
| **X** | Analyte was detected above the reporting limit at a concentration equal to X. |
| < x | Analyte was not detected at reporting limit equal to x. If the < x value is bolded, the reporting limit exceeded the CGWSL. |
| CGWSL | Critical Groundwater Screening Level (see Table 3) |
| CGWSL Source | Source for CGWSL value (see Table 3) |
| DCE | Dichloroethene |
| Dup | Duplicate sample indicator |
| EPA MCL | EPA Maximum Contaminant Level from "Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites" |
| FD | Field Duplicate sample |
| mg/L | milligrams per liter |
| MTBE | Methyl-Tert-Butylether |
| NMED TPH | New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, February 2012, TPH Screening Guidelines for Potable Groundwater |
| NMED TW | New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation, February 2012, Tap Water Screening Level |
| ug/L | micrograms per liter |
| WQCC Dom | NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B |
| WQCC HH | NMED Groundwater standard for human health exposure taken from 20.6.2.3103.A |
| WQCC Irr | NMED Groundwater standard for irrigation exposure taken from 20.6.2.3103.C |

| Lab Footnote | Definition |
|---|---|
| B | Analyte was also detected in the associated method blank. |
| J | Indicates an estimated value. |
| R | Rejected. |
| U | The compound was analyzed for but not detected at the reporting limit shown. |
| UJ | The compound was not detected at the reporting limit shown but the reporting limit is an estimated value. |

# Table 5
## RO System Reject Water Analytical Data
Navajo Refinery, Artesia, New Mexico

| | | Metals | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Aluminum | Arsenic | Barium | Beryllium | Boron | Cadmium | Calcium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Manganese | Molybdenum | Nickel | Potassium | Selenium | Silver | Sodium | Vanadium | Zinc |
| | Units: | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L |
| | CGWSL: | 5 | 0.01 | 1 | 0.004 | 0.75 | 0.005 | -- | 0.05 | 0.05 | 1 | 1 | 0.05 | - | 0.2 | 1 | 0.2 | - | 0.05 | 0.05 | - | 0.18 | 10 |
| | Source: | WQCC | MCL | WQCC | MCL | WQCC | MCL | | WQCC | WQCC | WQCC | WQCC | WQCC | | WQCC | WQCC | WQCC | | WQCC | WQCC | | EPA | WQCC |
| | Date | | | | | | | | | | | | | | | | | | | | | | |
| Reverse Osmosis Reject Water | 12/27/2004 | <0.01 | 0.00725 | 0.0669 | <0.002 | 0.071 | <0.002 | 628 | <0.005 | <0.005 | 0.00586 | <0.2 | <0.005 | 198 | <0.005 | 0.00793 | <0.005 | 4.11 | 0.01 | <0.005 | 131 | 0.0104 | 0.0259 |
| | 1/16/2007 | <0.01 | <0.005 | 0.0638 | <0.002 | 0.0568 | <0.002 | 694 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 233 | <0.005 | 0.00744 | <0.005 | 4.48 | 0.0095 | <0.005 | 234 | 0.00991 | 0.00839 |
| | 2/22/2007 | <0.01 | 0.00941 | 0.0681 | <0.002 | 0.0643 | <0.002 | 735 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 246 | <0.005 | 0.00813 | <0.005 | 4.49 | 0.00761 | <0.005 | 320 | 0.0102 | 0.00734 |
| | 7/5/2007 | 0.0168 | <0.005 | 0.0553 | <0.002 | 0.0644 | <0.002 | 600 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 176 | <0.005 | 0.00882 | <0.005 | 3.47 | 0.00763 | <0.005 | 167 | 0.00974 | 0.00749 |
| | 12/14/2007 | <0.01 | <0.005 | 0.0704 | <0.002 | 0.0752 | <0.002 | 594 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 208 | <0.005 | 0.00952 | <0.005 | 4.32 | 0.00793 | <0.005 | 218 | 0.0104 | 0.00677 |
| | 2/7/2008 | <0.01 | <0.005 | 0.0564 | <0.002 | 0.0773 | <0.002 | 548 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 179 | <0.005 | 0.00639 | <0.005 | 3.34 | 0.0058 | <0.005 | 206 | 0.00771 | <0.005 |
| | 5/22/2008 | <0.01 | <0.005 | 0.0602 | <0.002 | 0.0819 | <0.002 | 562 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 180 | <0.005 | 0.0073 | <0.005 | 3.72 | 0.00877 | <0.005 | 167 | 0.0116 | 0.00694 |
| | 8/29/2008 | <0.01 | <0.005 | 0.0783 | <0.002 | 0.0896 | <0.002 | 786 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 247 | <0.005 | 0.0108 | <0.005 | 4.68 | 0.00658 | <0.005 | 152 | 0.0106 | 0.00657 |
| | 12/4/2008 | NA | <0.005 | 0.0759 | NA | NA | <0.002 | NA | <0.005 | NA | NA | NA | <0.005 | NA | NA | NA | NA | NA | 0.00942 | <0.005 | NA | NA | NA |
| | 2/23/2009 | <0.01 | <0.005 | 0.0611 | <0.002 | 0.0786 | <0.002 | 698 | <0.005 | <0.005 | <0.005 | <0.2 | <0.005 | 215 | <0.005 | 0.00976 | <0.005 | 4.14 | 0.00893 | <0.005 | 192 | 0.0107 | <0.005 |
| | 5/7/2009 | <0.05 | <0.025 | 0.074 | <0.01 | <0.1 | <0.01 | 596 | <0.025 | <0.025 | <0.025 | <1 | <0.025 | 198 | <0.025 | <0.025 | <0.025 | 4 | <0.025 | <0.025 | 224 | <0.025 | <0.025 |
| | 8/25/2009 | NA | <0.005 | 0.0751 | NA | NA | <0.002 | NA | <0.005 | NA | NA | NA | <0.005 | NA | NA | NA | NA | NA | 0.0082 | <0.005 | NA | NA | NA |
| | 11/9/2009 | NA | <0.005 | 0.0816 | <0.002 | <0.005 | <0.002 | NA | <0.005 | NA | NA | NA | <0.005 | NA | NA | NA | NA | NA | 0.00702 | <0.005 | NA | NA | NA |
| | 2/25/2010 | NA | <0.005 | 0.0644 | NA | NA | <0.002 | NA | <0.005 | NA | NA | NA | <0.005 | NA | NA | NA | NA | NA | 0.00668 | <0.005 | NA | NA | NA |
| | 5/27/2010 | NA | <0.005 | 0.0529 | NA | NA | <0.002 | 602 | <0.005 | NA | NA | NA | <0.005 | 144 | NA | NA | NA | 3.22 | 0.00627 | <0.005 | 115 | NA | NA |
| | 8/12/2010 | NA | <0.005 | 0.0819 | NA | NA | <0.004 | 651 | <0.005 | NA | NA | NA | <0.010 | 186 | NA | NA | NA | 4.72 | 0.0106 | <0.005 | 164 | NA | NA |
| | 11/23/2010 | NA | <0.025 | 0.344 | NA | NA | <0.01 | NA | <0.025 | NA | NA | NA | <0.025 | NA | NA | NA | NA | NA | 0.0347 | <0.025 | NA | NA | NA |
| | 2/23/2011 | NA | NA | 0.0583 | NA | 0.0629 | NA | 620 | NA | NA | NA | NA | NA | 166 | NA | 0.00757 | NA | 3.51 | 0.00551 | NA | 163 | 0.00869 | NA |
| | 5/24/2011 | NA | NA | 0.0681 | NA | 0.0675 | NA | 622 | NA | NA | 0.0229 | NA | NA | 171 | NA | 0.0127 | NA | 3.93 | 0.012 | NA | 108 | 0.0114 | 0.0167 |
| | 8/23/2011 | 0.0226 | NA | 0.0633 | NA | 0.0835 | NA | 604 | NA | NA | NA | NA | NA | 172 | NA | 0.0103 | NA | 3.59 | NA | NA | 49.8 | 0.0103 | NA |
| | 11/16/2011 | NA | 0.0124 | 0.0445 | NA | NA | NA | 520 | NA | NA | NA | NA | NA | 136 | NA | 0.00824 | 0.00563 | 3.03 | NA | NA | 40 | NA | 0.0102 |

# Table 5
# RO System Reject Water Analytical Data
Navajo Refinery, Artesia, New Mexico

| | | Volatiles | | | | Semi Volatiles | Anions | | | Total Alkalinity |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Ethyl benzene | Tetrachloro ethene | Xylenes | Naph thalene | Chloride | Fluoride | Sulfate | |
| | Units: | µg/L | µg/L | µg/L | µg/L | µg/L | mg/L | mg/L | mg/L | mg/L |
| | CGWSL: | 5 | 700 | 5 | 620 | 30 | 250 | 1.6 | 600 | - |
| | Source: | MCL | MCL | MCL | WQCC | WQCC | WQCC | WQCC | WQCC | - |
| | Date | | | | | | | | | |
| Reverse Osmosis Reject Water | 12/27/2004 | <5 | <5 | <5 | <10 | <10 | 233 | 3.16 | 1,660 | 622 |
| | 1/16/2007 | NA | NA | NA | NA | NA | 515 | 3.98 | 2,160 | 669 |
| | 2/22/2007 | <5 | <5 | <5 | <15 | <5 | 583 | 3.38 | 1,920 | 638 |
| | 7/5/2007 | <5 | <5 | <5 | <15 | <5 | 328 | 2.91 | 1,560 | 520 |
| | 12/14/2007 | <5 | <5 | <5 | <15 | <5 | 464 | 3.46 | 1,910 | 982 |
| | 2/7/2008 | <5 | <5 | <5 | <15 | <5 | 417 | 2.55 | 1,540 | 575 |
| | 5/22/2008 | <5 | <5 | <5 | <15 | <5 | 293 | 2.82 | 1,530 | 296 |
| | 8/29/2008 | <5 | <5 | <5 | <15 | <5 | 241 | 3.98 | 1,980 | 869 |
| | 12/4/2008 | <5 | <5 | <5 | <15 | <5 | 307 | 3.76 | 1,810 | 819 |
| | 2/23/2009 | NA | NA | NA | NA | NA | 325 | 3.17 | 1,740 | 691 |
| | 5/7/2009 | NA | NA | NA | NA | NA | 392 | 2.83 | 1,740 | 664 |
| | 8/25/2009 | NA | NA | NA | NA | NA | 461 | 3.62 | 1,870 | 729 |
| | 11/9/2009 | NA | NA | NA | NA | NA | 525 | 3.92 | 2,040 | 787 |
| | 2/25/2010 | NA | NA | NA | NA | NA | 355 | 3.1 | 1,650 | 613 |
| | 5/27/2010 | NA | NA | NA | NA | NA | 180 | 2.66 | 1,290 | 557 |
| | 8/12/2010 | NA | NA | NA | NA | NA | 357 | 3.95 | 2,220 | 920 |
| | 11/23/2010 | NA | NA | NA | NA | NA | 344 | 3.46 | 1,750 | 822 |
| | 2/23/2011 | NA | NA | NA | NA | NA | 378 | 2.76 | 1,480 | 697 |
| | 5/24/2011 | NA | NA | NA | NA | NA | 167 | 3.59 | 1,930 | 848 |
| | 8/23/2011 | NA | NA | NA | NA | NA | 55.3 | 3.32 | 1,630 | 773 |
| | 11/16/2011 | NA | NA | NA | NA | NA | 54.4 | 2.62 | 1,150 | 623 |

**Footnotes and Definitions**

3.16 Concentration shown exceeds the CGWSL

Abbreviations:

CGWSL = Critical Groundwater Screening Level (see Table 3)
mg/L = Milligrams per liter
NA = Not analyzed

CGWSL Source (see Table 3):

" - " = No standard available
MCL = Maximum Contaminant Level from the National Primary Drinking Water Standards
WQCC = Water Quality Control Commission; standard for groundwater from NMAC 20.6.2.3103

# Table 6
## Summary of Production from Recovery Trenches and Wells
Navajo Refinery, Artesia, New Mexico

| Recovery Well | Volume of Hydrocarbons Recovered (gallons) | | | | | Volume of Water Recovered (gallons) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Total 2011 | 1st Qtr | 2nd Qtr | 3rd Qtr | 4th Qtr | Total 2011 |
| RW-1 | 0 | 1,602 | 1,170 | 0 | 2,772 | 0 | 14,418 | 10,530 | 0 | 24,948 |
| RW-2 | 0 | 0 | 1,980 | 74,520 | 76,500 | 0 | 0 | 17,820 | 670,680 | 688,500 |
| RW-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-5 | 5,310 | 11,838 | 0 | 0 | 17,148 | 47,790 | 106,542 | 0 | 0 | 154,332 |
| RW-6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-7 | 0 | 6 | 696 | 0 | 702 | 0 | 54 | 6,264 | 0 | 6,318 |
| RW-8 | 0 | 13,428 | 3,480 | 0 | 16,908 | 0 | 120,852 | 31,320 | 0 | 152,172 |
| RW-9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RW-18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chase | 0 | 0 | 351 | 233 | 584 | 0 | 0 | 34,771 | 23,077 | 57,848 |
| KWB-4 | 7 | 22 | 144 | 109 | 282 | 0 | 0 | 0 | 0 | 0 |
| KWB-5 | 0.5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| KWB-6 | 2 | 13 | 81 | 61 | 157 | 0 | 0 | 0 | 0 | 0 |
| KWB-8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-34 | 0 | 226 | 190 | 0 | 416 | 0 | 0 | 0 | 0 | 0 |
| MW-64 | 0 | 24 | 0 | 44 | 68 | 0 | 0 | 0 | 0 | 0 |
| MW-65 | 0 | 17 | 35 | 101 | 153 | 0 | 0 | 0 | 0 | 0 |
| MW-85 | 3 | 1 | 5 | 0 | 8 | 0 | 0 | 0 | 0 | 0 |
| MW-86 | 3 | 1 | 5 | 0 | 9 | 0 | 0 | 0 | 0 | 0 |
| MW-94 | 1,500 | 327 | 335 | 30 | 2,192 | 0 | 0 | 0 | 0 | 0 |
| MW-96 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| MW-97 | 0 | 58 | 291 | 333 | 682 | 0 | 0 | 0 | 0 | 0 |
| MW-102 | 0 | 30 | 58 | 129 | 217 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 6,825 | 27,592 | 8,821 | 75,560 | **118,798** | 47,790 | 241,866 | 100,705 | 693,757 | **1,084,118** |