

**FORT WINGATE DEPOT ACTIVITY  
FACILITY-WIDE  
GROUND WATER PERIODIC MONITORING REPORT  
for  
October 2009 to January 2010**

**JANUARY 2011, Version 2**

**(RCRA Permit Number NM6213820974)**



***Prepared for:  
Base Realignment and Closure (BRAC)***

***Prepared by:  
U.S. Army Corps of Engineers, Albuquerque District***

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U.S. Army Corps of Engineers, Fort Worth District***

## **E.S.1.0 EXECUTIVE SUMMARY**

This Ground Water Periodic Monitoring Report (GWPMR) describes the results of the October 2009 and January 2010 ground water monitoring and sampling activities conducted as part of the environmental restoration program for the Fort Wingate Depot Activity (FWDA). This document has been prepared for submission to the New Mexico Environment Department (NMED) – Hazardous Waste Bureau (HWB), as required by Section V.A of Resource, Conservation, and Recovery Act (RCRA) Permit No. NM 6213820974 (NMED 2005).

### **E.S.1.1 Purpose**

The purpose of this GWPMR is to describe ground water monitoring and fieldwork activities executed by the United States Army Corps of Engineers (USACE), on behalf of the Base Realignment and Closure (BRAC) office, for the reporting period of October 2009 through January 2010. The report summarizes ground water sampling and monitoring field activities, chemical analytical results of ground water samples, and the evaluation of ground water elevation measurements.

### **E.S.1.2 Investigation**

USACE measured the Depth to Water (DTW) in monitoring wells during the months October 2009 and January 2010. Ground water samples were collected from 56 monitoring wells during the month of October 2009 and analyzed for constituent groups. These monitoring wells are located in two major areas of FWDA: the Northern Area and the Open Burn and Open Detonation (OB/OD) Area. Monitoring wells are discussed throughout the report relative to the area in which they are located.

#### *E.S.1.2.1 Ground Water Measurements*

October 2009 DTW measurements from existing monitoring wells located in the Northern Area of the installation were evaluated to determine the gradient of ground water in alluvium and bedrock. OB/OD Area monitoring wells DTW measurements were evaluated to determine the gradient of ground water in the OB/OD Area. During November and December of 2009, nine new monitoring wells were installed in the Northern Area. Three alluvial monitoring wells were installed in Parcel 11, and one alluvial monitoring well and five bedrock wells were installed in Parcels 21 and 22. The DTW measurements from these new monitoring wells were recorded in January 2010 and incorporated into the January 2010 evaluation of the ground water gradient in the Northern Area. Additionally, the U.S. Geological Survey installed ten piezometers along the south fork of the Rio Puerco during the months of November and December of 2009. The DTW measurements from these piezometers were also incorporated into the January 2010 evaluation of the ground water gradient in the Northern Area.

#### *E.S.1.2.2 Ground Water Sampling*

USACE collected samples from 16 existing ground water monitoring wells located in the OB/OD Area. As noted in the *approved* March 2008 Interim Facility-Wide Ground Water Monitoring Plan (GWMP), the existing wells were installed to characterize

releases from the Hazardous Waste Management Unit (HWMU) and Solid Waste Management Units (SWMU) located in Parcel 3 (TPMC 2008). Ground water samples collected during the month of October 2009 from monitoring wells located in the OB/OD Area were analyzed for constituents/constituent groups identified below:

- Explosives
- Nitrate/nitrite
- Perchlorate
- Target Analyte List (TAL) metals + mercury (total and dissolved)
- Target Compound List (TCL) volatile organic compounds (VOC)
- TCL semi-volatile organic compounds (SVOC)
- Dioxins and Furans

USACE collected samples from 40 existing ground water monitoring wells located in the Northern Area during the month of October 2009. These monitoring wells were installed primarily to characterize releases from the 2,4,6-Trinitrotoluene (TNT) Leaching Beds Area; Administration Area (multiple SWMUs and Areas of Concern [AOC]) located in Parcels 6, 7, 11, 21, and 22; Eastern Landfill Area; and the Buildings 542 and 600 Area (TPMC 2008). Ground water samples collected from these monitoring wells were analyzed for constituents/constituent groups listed below:

- Explosives
- Nitrate/nitrite
- Perchlorate
- TAL metals + mercury (total and dissolved)
- TCL VOCs
- TCL SVOCs
- Dioxins and furans

Samples from selected monitoring wells (MW-18D, MW-20, MW-22S, and MW-22D) installed to monitor releases from SWMU 45 were analyzed for Total Petroleum Hydrocarbons (TPH), Diesel-Range Organics, and Gasoline-Range Organics (DRO/GRO).

### **E.S.1.3 Results**

Alluvial ground water in the northern portion of the installation had a gradient that converged in the Administration Area from potentiometric highs in the east, north, and south directions. From the Administration Area, the gradient was westerly. Bedrock ground water in the northern portion of the installation had a westerly gradient. Ground water elevation measurements taken in the OB/OD Area indicated a general northern gradient that roughly followed the topography.

Results of ground water samples collected from monitoring wells in the Northern Area indicated DRO/GRO, VOC, explosive compounds, nitrate/nitrite, and perchlorate impacts to ground water. The OB/OD Area ground water sample results indicated explosives impacts to ground water.

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## LIST ACRONYMS

AOC	Area of Concern
APPL	Agriculture & Priority Pollutant Laboratories
BCT	Base Realignment and Closure Cleanup Environmental Team
BIA	Bureau of Indian Affairs
BRAC	Base Realignment and Closure
°C	Degree Celsius
CFR	Code of Federal Regulations
DCA	Dichloroethane
DO	Dissolved Oxygen
DRO	Diesel-Range Organics
DTW	Depth to Water
EPA	Environmental Protection Agency
ft	Foot/Feet
ft-msl	Feet above Mean Sea Level
FWDA	Fort Wingate Depot Activity
GMS	Groundwater Modeling System
GRO	Gasoline-Range Organics
GWMP	Ground-Water Monitoring Plan
GWPMR	Ground-Water Periodic Monitoring Report
HWB	Hazardous Waste Bureau
HWMU	Hazardous Waste Management Unit
ICM	Improved Conventional Munitions
ID	Identification
IDW	Investigation Derived Waste
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
MSL	Mean Sea Level
MSSL	Medium-Specific Screening Level
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NTU	Nephelometric Turbidity Unit
OB/OD	Open Burn/Open Detonation
PPE	Personal Protective Equipment
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QCSR	Quality Control Summary Report
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RSL	Regional Screening Level
SU	Standard Unit
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List

TCL	Target Compound List
TOC	Top of Casing
TNT	2,4,6-Trinitrotoluene
TPH	Total Petroleum Hydrocarbons
µg/L	Micrograms per liter
uS/cm	Micro-Siemens per centimeter
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
VOC	Volatile Organic Compound
ZIST	Zone Isolation Sampling Technology
UXO	Unexploded Ordnance



## 1.0 INTRODUCTION

This Ground Water Periodic Monitoring Report (GWPMR) for Fort Wingate Depot Activity (FWDA) describes ground-water monitoring activities conducted as part of the FWDA environmental restoration program. The GWPMR was prepared by the U.S. Army Corps of Engineers (USACE), Albuquerque District, and reviewed by USACE, Fort Worth District. It was prepared on behalf of the Base Realignment and Closure (BRAC) office for submission to the New Mexico Environment Department (NMED) – Hazardous Waste Bureau (HWB) as required by Section V.A of the Resource, Conservation, and Recovery Act (RCRA) Permit (hereinafter referred to as “the Permit”) for FWDA. The Permit (NM 6213820974) was finalized in December 2005 and became effective 31 December 2005 (NMED 2005).

FWDA is an inactive U.S. Army depot with a former mission to receive, store, and ship material and to dispose of obsolete or deteriorated explosives and military munitions (TPMC 2008). The active mission of FWDA ceased and the installation closed in January 1993 as a result of the Defense Authorization Amendments and Base Realignment and Closure Act of 1988.

FWDA currently occupies approximately 24 square miles (approximately 15,277 acres) of land in McKinley County in northwestern New Mexico. The installation is located approximately seven miles east of Gallup on U.S. Highway 66 and approximately 130 miles west of Albuquerque on Interstate 40 (Figure 1-1) (TPMC 2008). FWDA contains facilities formerly used to operate a reserve storage activity that provided care, preservation, and minor maintenance of assigned commodities, primarily conventional military munitions (TPMC 2006). The FWDA mission included the disassembly and demilitarization of unserviceable and obsolete military munitions. Ammunition maintenance facilities existed for the clipping, linking, and repackaging of small arms ammunition (TPMC 2006).

The installation is surrounded by federally owned or administered lands, including both national forest and tribal lands. North and west of FWDA are Navajo tribal trust and allotted lands. East of FWDA is land administered by the Bureau of Indian Affairs (BIA). Red Rock State Park, a Zuni railroad siding, an El Paso Natural Gas fractioning plant and housing area, the Navajo community of Church Rock, and transportation corridors for Interstate 40, U.S. Highway 66, and the Burlington Northern and Santa Fe Railroad are located north of the installation (TPMC 2006). The town of Fort Wingate is located to the east of FWDA on BIA administered land and was the original Fort Wingate headquarters site (TPMC 2006). Cibola National Forest borders the south and southeast perimeters of the installation and incorporates mostly undeveloped forest lands (TPMC 2006). To the west is primarily undeveloped tribal trust and allotment land administered by the BIA, Navajo Nation, and individual Native American allottees (TPMC 2006).

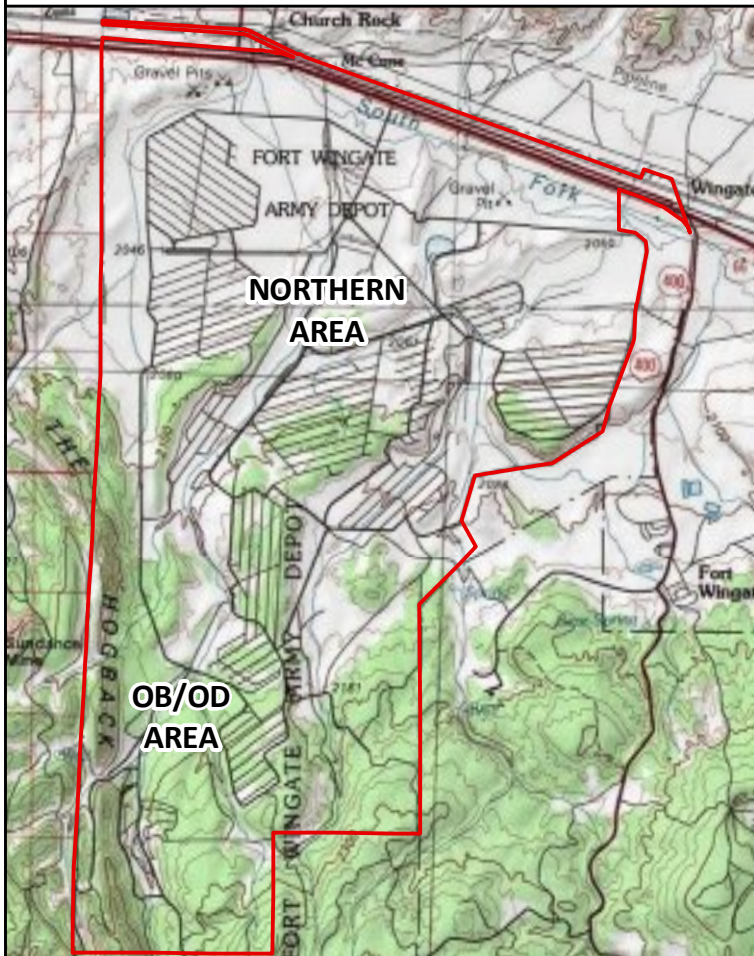
As required by section V.A of the Permit, the NMED required the Army to implement an Interim Facility-Wide Ground Water Monitoring Plan (NMED 2005). The NMED approved the FWDA Interim Facility-Wide Ground Water Monitoring Plan (GWMP) in

March 2008 (TPMC 2008). The GWMP was prepared in consultation with the Pueblo of Zuni and the Navajo Nation according to provisions of the Permit, Section VIII.B.1 (20.4.1.500 NMAC [incorporating 40 CFR 264.101]) (TPMC 2008). The format of this GWPMR follows the guidelines presented in the NMED's *General Reporting Requirements for Routine Groundwater Monitoring at RCRA Sites* (NMED 2003), and describes results and activities conducted from October 2009 through January 2010.

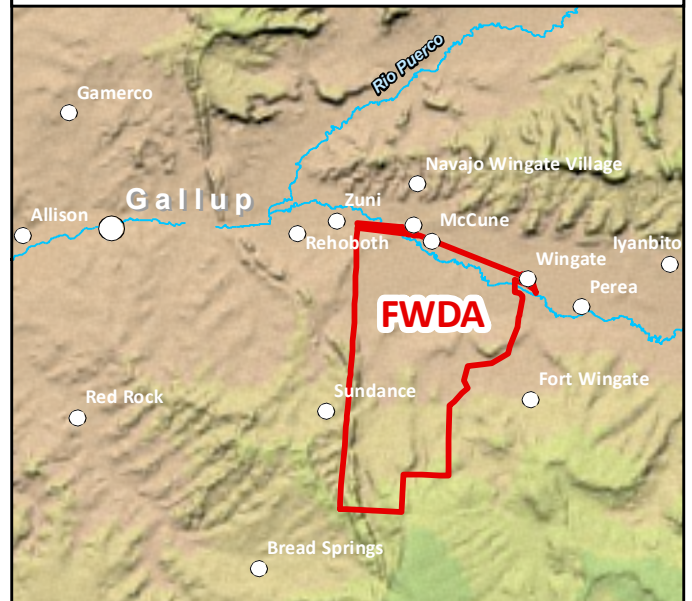
**Ft. Wingate Army Depot  
Location within U.S.A.**



**Ft. Wingate Army Depot  
1:100,000 Scale**



**Ft. Wingate Army Depot  
1:325,000 Scale**



**FIGURE 1-1  
Ft. Wingate Depot Activity  
Installation Boundary in Red**

Map Date: June 4, 2010

Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Thomas McTighe  
Reviewed by: David Henry



## **2.0 SCOPE OF SERVICES**

This section summarizes the scope of activities conducted for the reporting period beginning in October 2009 and ending in January 2010. USACE measured and recorded ground-water elevations in accordance with the GWMP, and ground-water samples were collected from monitoring wells in accordance with the GWMP. Monitoring well locations are shown in Figure 2-1.

### **2.1 GROUND-WATER ELEVATIONS**

In October 2009 and January 2010, USACE mobilized to measure Depth to Water (DTW) in monitoring wells. Section 4 of this GWPMR contains detailed site activities and results of DTW measurements, including tabulated ground-water elevation data and ground-water elevation contour maps.

### **2.2 GROUND-WATER SAMPLING**

In October 2009, USACE collected ground-water samples from monitoring wells. Section 5 of this GWPMR contains detailed sampling activities and chemical results, including tabulated chemical data and isoconcentration contour maps. Ground-water chemical data generated for this event are located in Tables 5-1 through 5-8 and displayed in Figure 5-1 through 5-4. Appendix A of this GWPMR, subdivided into Appendices A1 through A5, contains the laboratory analytical results, reports, validation, and Quality Control Summary Report (QCSR).

#### ***2.2.1 OPEN BURN/OPEN DETONATION UNIT GROUND-WATER SAMPLING***

USACE collected ground-water samples for chemical analysis from 16 existing monitoring wells located in the Open Burn/Open Detonation (OB/OD) Area. Ground-water samples collected from monitoring wells in and around the OB/OD Unit and Parcel 3 Solid Waste Management Units (SWMU) were analyzed for constituents/constituent groups identified in Table 2-1. NMED authorized the Army to reduce analytical requirements based on chemical results of the three previous ground-water sampling events recorded in April 2008, October 2008, and April 2009 (NMED 2009). Table 2-1 was generated based on this reduction.

All monitoring wells identified for sampling in the GWMP were sampled with the exception of KMW13, CMW06, CMW16, CMW20, and CMW21. KMW13 was dry. Monitoring wells CMW06 and CMW16 have been buried by flooding since the beginning of the sampling program, and CMW 21 was buried by flooding some time after the April 2009 sampling event. CMW20 has been damaged by flooding and is no longer an acceptable sampling location.

### 2.2.2 NORTHERN AREA FWDA GROUND-WATER SAMPLING

USACE collected ground-water samples from 40 existing monitoring wells located in the Northern Area of FWDA. These monitoring wells were installed to characterize releases from the 2,4,6-Trinitrotoluene (TNT) Leaching Beds Area (SWMU 1) located within Parcel 21; Administration Area (multiple SWMUs and Areas of Concern [AOCs]) located in Parcels 6, 7, 11 and 21; Eastern Landfill Area (SWMU 13) located within Parcel 18; and the Buildings 542 and 600 Area (SWMUs 11 and 4) located within Parcel 6.

Ground-water samples from monitoring wells MW18D, MW20, MW22S, and MW22D were analyzed for Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) to monitor releases in Parcel 11 from SWMU 45. USACE sampled all monitoring wells identified for sampling in the GWMP with the exception of TMW05 and MW18S. These monitoring wells were dry.

As with the OB/OD Area, the Northern Area analytical requirements were reduced based on chemical results of the three previous ground-water sampling events (April 2008, October 2008, and April 2009). These analytical requirements are shown in Table 2-1.

Table 2-1: Ocotober 2009 Ground Water Sampling Analytical List

Well ID	Total Explosives Method 8330	TCL VOC Method 8260C	TCL SVOC Method 8270D	Dioxins and Furans Method 8290A	TCL Pesticides Method 8081	TAL Total Metals Methods 6010B/ 7470	TAL Dissolved Metals Methods 6010B/ 7470	Total Nitrate Method 300.0	Perchlorate Method 6850	TPH DRO and DRO Method 8015B
CMW02		1		1	1	1	1	1	1	
CMW04		1				1	1			
CMW07		1		1		1	1			
CMW10		1	1	1		1	1	1	1	
CMW14	1	1	1			1	1	1	1	
CMW16	1					1	1	1		
CMW17	1	1				1	1	1	1	
CMW18	1	1	1	1		1	1	1	1	
CMW19		1	1	1	1	1	1	1	1	
CMW20	1	1				1	1			
CMW21		1				1	1	1		
CMW22		1		1		1	1	1		
CMW23	1	1				1	1			
CMW24	1	1	1	1	1	1	1	1		
CMW25		1		1	1	1	1	1		
EMW01		1	1	1	1	1	1		1	
EMW02	1	1	1		1	1	1	1		
EMW03	1	1	1	1	1	1	1	1		
EMW04		1	1			1	1	1		
FW10	1	1				1	1	1	1	
FW31	1		1	1		1	1	1		
FW35	1	1	1			1	1	1		
KMW09	1	1		1		1	1	1	1	
KMW10		1	1			1	1	1	1	
KMW11		1		1		1	1	1	1	
KMW12		1				1	1	1		
KMW13	1					1	1	1		
MW01	1	1			1	1	1	1	1	1
MW02	1	1			1	1	1	1	1	1

Table 2-1: Ocotober 2009 Ground Water Sampling Analytical List

Well ID	Total Explosives Method 8330	TCL VOC Method 8260C	TCL SVOC Method 8270D	Dioxins and Furans Method 8290A	TCL Pesticides Method 8081	TAL Total Metals Methods 6010B/ 7470	TAL Dissolved Metals Methods 6010B/ 7470	Total Nitrate Method 300.0	Perchlorate Method 6850	TPH DRO and DRO Method 8015B
MW03	1	1				1	1	1	1	1
MW18D	1	1				1	1	1	1	1
MW20	1	1	1		1	1	1	1	1	1
MW22D	1	1	1	1	1	1	1	1	1	1
MW22S	1	1	1	1	1	1	1	1	1	1
SMW01		1	1			1	1	1		
TMW01		1		1		1	1	1	1	
TMW02	1	1		1		1	1	1	1	
TMW03	1	1	1			1	1	1	1	
TMW04	1	1	1			1	1	1	1	
TMW05						1	1	1	1	
TMW06	1	1	1			1	1	1		
TMW07	1	1	1	1		1	1	1		
TMW08		1			1	1	1	1		1
TMW10	1	1				1	1	1	1	
TMW11	1	1		1		1	1	1	1	
TMW13		1		1		1	1	1	1	
TMW14	1	1	1	1		1	1	1		
TMW15	1	1	1	1		1	1	1	1	
TMW16	1	1	1	1		1	1		1	
TMW17		1				1	1	1		
TMW18	1	1	1			1	1	1		
TMW19	1	1	1			1	1			
TMW21	1	1				1	1	1	1	
TMW22	1	1	1			1	1	1	1	
TMW23	1	1		1	1	1	1	1	1	
TMW24	1	1			1	1	1	1	1	
TMW25		1				1	1	1		
TMW26		1				1	1	1		
TMW27		1		1		1	1			

**Table 2-1: Ocotober 2009 Ground Water Sampling Analytical List**

<b>Well ID</b>	<b>Total Explosives Method 8330</b>	<b>TCL VOC Method 8260C</b>	<b>TCL SVOC Method 8270D</b>	<b>Dioxins and Furans Method 8290A</b>	<b>TCL Pesticides Method 8081</b>	<b>TAL Total Metals Methods 6010B/7470</b>	<b>TAL Dissolved Metals Methods 6010B/7470</b>	<b>Total Nitrate Method 300.0</b>	<b>Perchlorate Method 6850</b>	<b>TPH DRO and DRO Method 8015B</b>
TMW28		1				1	1			
TMW29		1				1	1	1	1	

VOC: Volatile Organci Compounds

SVOC: Semi-Volatile Organci Compounds

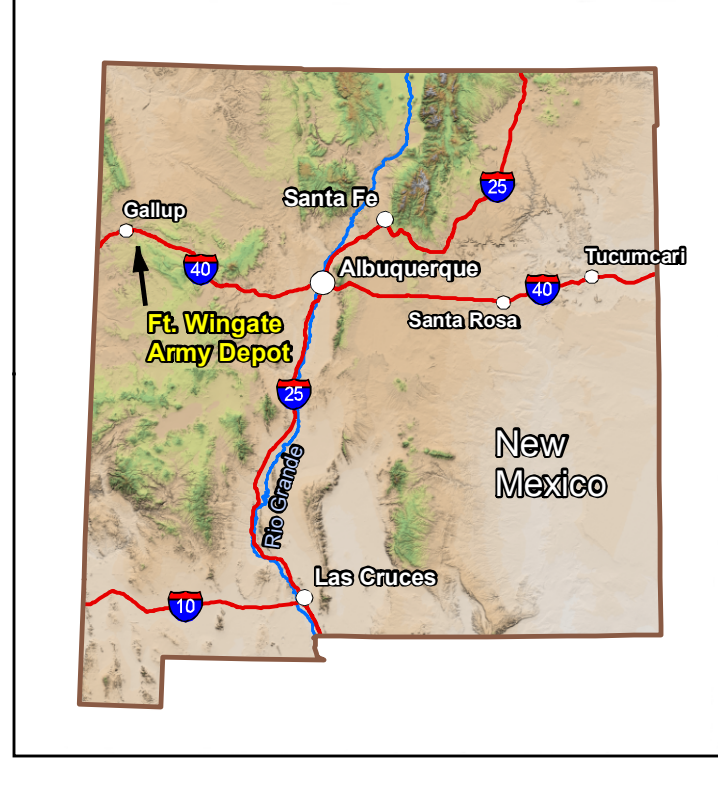
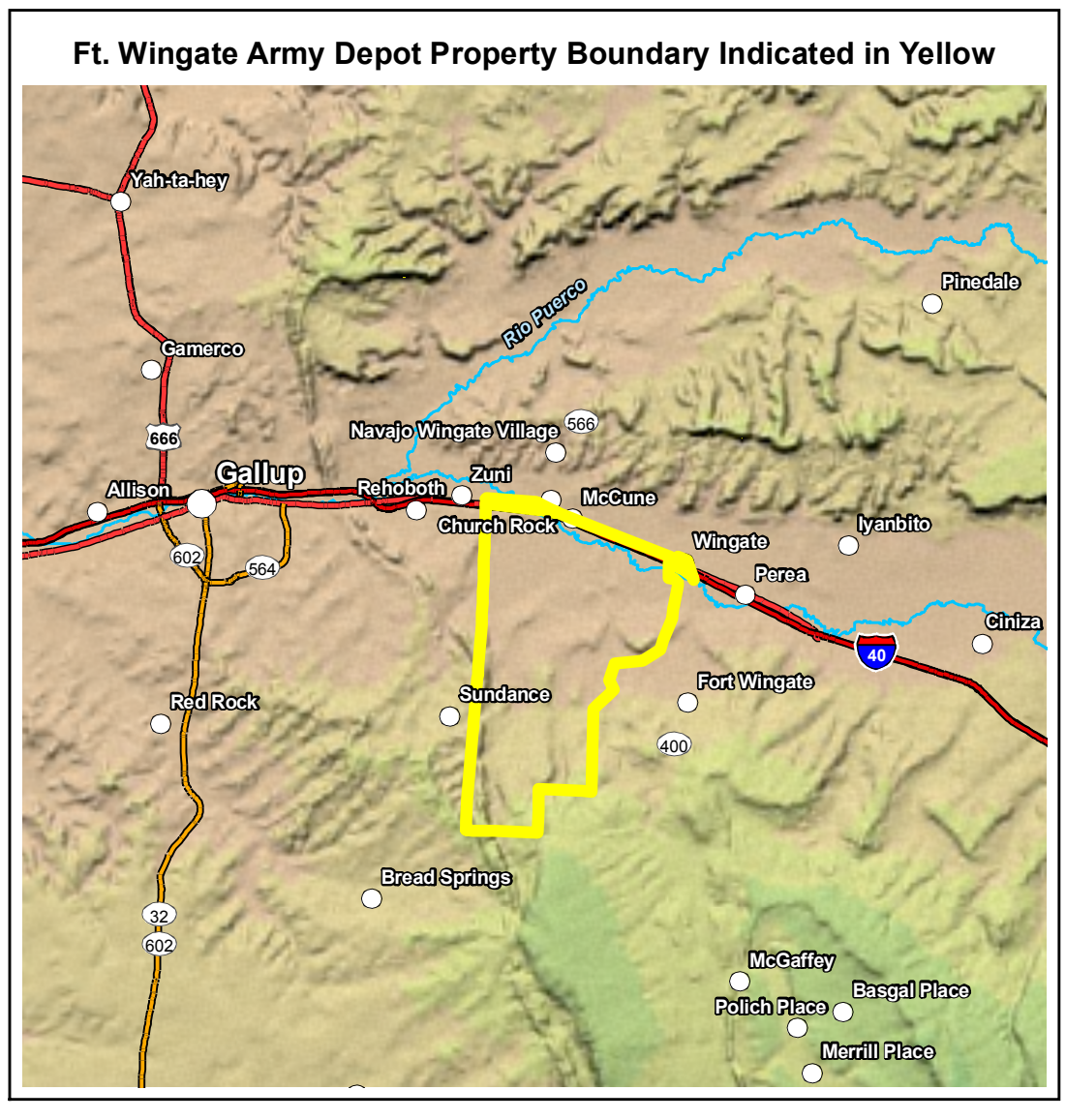
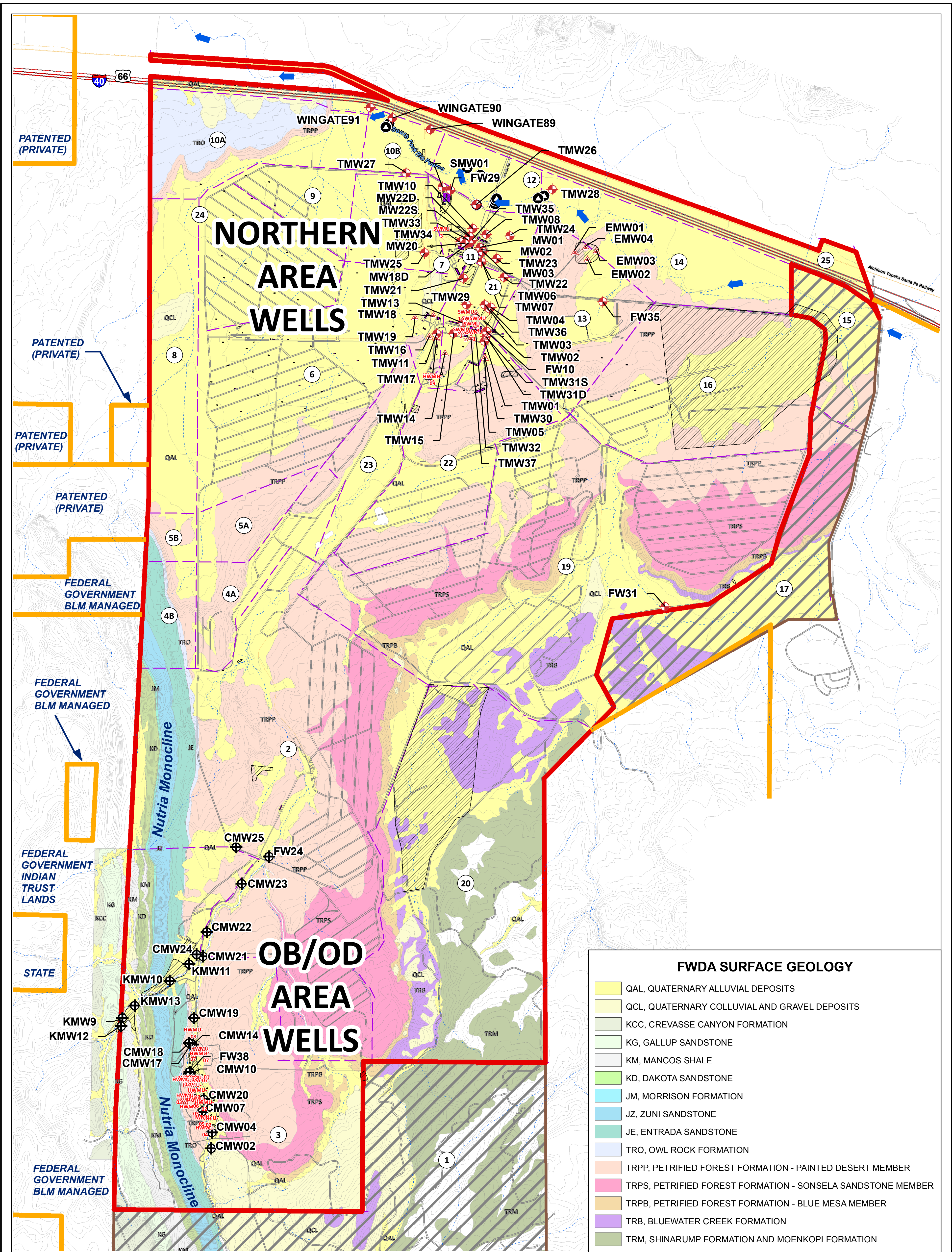
TAL: Target Analyste List

TCL: Target Compund List

TPH: Total Petroleum Hydrocarbons

GRO/DRO: Gasoline Range Organics/Diesel Range Organics





- PIEZOMETERS
- NORTHERN AREA ALLUVIAL MONITORING WELLS
- NORTHERN AREA BEDROCK MONITORING WELLS
- OB/OD AREA MONITORING WELLS
- FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- SOLID WASTE MANAGEMENT UNIT (SWMU)
- HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- ADJOINING PROPERTY BOUNDARY
- BUILDINGS
- FWDA PROPERTY BOUNDARY, FEB 2002
- ⑦ PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- TRANSFERRED FWDA PROPERTY
- PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 2-1**  
**Monitoring Well Locations**

1 Miles  
1 Kilometers

State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.

Map Scale: 1:20,000 (1" = 1667")  
Map Date: June 4, 2010

Data sources: drainages, railroad, roads: Tele Atlas  
GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry

**US Army Corps of Engineers**  
Albuquerque District

### 3.0 REGULATORY CRITERIA

The GWMP, which governs ground-water monitoring and sampling activities, was developed in consultation with the Pueblo of Zuni and the Navajo Nation. NMED approved the GWMP in March 2008. The GWMP provides requirements and guidance for ground-water monitoring for the entire facility. All ground-water monitoring and sampling implemented pursuant to the GWMP and the Permit began in January 2008.

The approved GWMP identifies the start date of the initial ground-water monitoring event, the location of monitoring wells, the sample requirements for each monitoring well, and the frequency of ground-water sampling and elevation monitoring events (TPMC 2008). The GWMP also contains operating procedures for collecting ground-water samples, such as purging monitoring wells before samples are collected, measuring ground-water quality while purging and before samples are collected, and the management of Investigative Derived Waste (IDW) (TPMC 2008). The Quality Assurance and Quality Control (QA/QC) program is also described in the GWMP (TPMC 2008). Finally, the GWMP requires that results of ground-water monitoring activities, which include the evaluation of ground-water elevation data and chemical analytical data, be presented to NMED and other BRAC Cleanup Environmental Team (BCT) members (Navajo Nation, Zuni Pueblo, Army, *etc.*) in the format outlined in the *General Reporting Requirements for Routine Groundwater Monitoring at RCRA Sites* (NMED 2003).

In addition to the GWMP requirements, the Permit requires the Army to determine the ground-water potentiometric surface elevation relative to Mean Sea Level (MSL) and to determine concentrations of hazardous constituents in ground water. In accordance with Attachment 7 of the Permit, the following documents and regulations were used to determine if the concentration of a particular hazardous constituent exceeds an established regulatory limit (NMED 2005).

- New Mexico Water Quality Control Commission (NMWQCC) standards of 20.6.2.4103.A and B NMAC.
- Environmental Protection Agency (EPA) drinking water Maximum Contaminant Level (MCL) under 40 CFR Parts 141 and 14.
- If both a NMWQCC standard and an EPA MCL have been established for a contaminant, the lower of the two was used as a criterion.
- If no NMWQCC standard or EPA MCL has been established for a *carcinogenic* hazardous constituent, the most recent version of the EPA Region VI *Human Health Medium-Specific Screening Levels* (MSSL) for tap water was used.
- If no NMWQCC standard or EPA MCL has been established for a *noncarcinogenic* hazardous constituent, the most recent version of the EPA Region VI (MSSL) for tap water was used.

- Currently, there is no NMWQCC ground-water standard or MCL for perchlorate; however, perchlorate concentrations were compared to the value noted in the Permit, 6 µg/L.

## 4.0 GROUND-WATER MONITORING RESULTS

USACE measured ground water from the Top of Casing (TOC) of each monitoring well by placing the tape measure of a Solinst water level meter at the TOC and sounding the depth of the water in the casing. Measurements were then recorded to the nearest 0.01 feet in field books. Appendix C contains copies of field books. To calculate the elevation of ground water from MSL, the DTW measurement was subtracted from the elevation of a surveyed measuring point at the TOC. Tables 4-1, 4-2, and 4-3 tabulate DTW measurements in feet (ft), the surveyed elevation of the TOC, and calculated ground-water elevations in ft-msl for the eight quarters, inclusive of October 2009 and January 2010. Figures 4-1, 4-2, 4-3, and 4-4 are ground-water elevation contour maps for this reporting period.

### 4.1 NORTHERN AREA GROUND-WATER ELEVATIONS

Two ground-water systems exist in the Northern Area: the alluvium and the bedrock. USACE evaluated the ground-water gradient of both of these systems. Table 4-1 contains tabulated data for wells screened in the alluvial system and Table 4-2 contains tabulated data for wells screened in the bedrock system. Figures 4-1, 4-2, and 4-3 present Northern Area ground-water elevation contour maps. Ground-water elevation contours presented in these figures were developed with the Groundwater Modeling System (GMS) software.

#### 4.1.1 Northern Area Alluvial Ground-Water System

Ground water in the alluvial system appeared to flow from potentiometric highs in the east, north, and south to a potentiometric low in the Administration Area. From the Administration Area, ground water appeared to flow to the west. This trend is shown for previous reporting periods.

Table 4-2 and Figure 4-2 contain new ground-water elevation data from four new *alluvial* monitoring wells. During November and December of 2009, three new monitoring wells were installed in Parcel 11, and one was installed in Parcel 21. USACE has incorporated these new monitoring wells into the FWDA ground-water monitoring program, and DTW was measured and recorded for the first time in January 2010. These monitoring wells are identified as TMW31S (a replacement well for FW10), TMW33, TMW34, and TMW35. Well logs and completion diagrams are presented in Appendix E.

In addition to the new monitoring wells noted above, the U.S. Geological Survey (USGS) installed ten piezometers along the south fork of the Rio Puerco on the northern portion of the installation in November and December of 2009. Figures 2-1 and 4-2 show the location of these piezometers. Each piezometer is fitted with a ground-water pressure transducer that measures and records ground-water elevation daily. USACE received ground-water elevation data from the USGS piezometers recorded January 25, 2010 (USGS 2010). Table 4-4 lists the USGS piezometer ground-water wells, and USACE used these data to create Figure 4-2.

#### 4.1.2 Northern Area Bedrock Ground-Water System

No ground-water elevation contour map was created for October 2009 for the bedrock system because TMW05 was dry. This situation created a data gap. During November and December of 2009, five new *bedrock* monitoring wells were installed in Parcels 21 and 22. These monitoring wells are identified as TMW30 (a replacement well for TMW05), TMW31D, TMW32, TMW36, and TMW37. TMW31S (alluvium) and TMW31D (bedrock) are “nested” monitoring wells constructed in a single borehole. Figure 4-3 is the bedrock ground-water elevation contour map for January 2010. Ground water appeared to flow westerly in January 2010.

#### 4.1.3 Eastern Landfill Monitoring Wells

The monitoring wells located at the East Landfill, EMW01, EMW02, EMW03, and EMW04 appear to be constructed in bedrock (claystone), or extremely tight clay and silt. All four monitoring wells around the east landfill have poor recharge. EMW04, in particular, takes a week or more to recover. We’ve have also noticed that since April 2008, the water level in EMW04 has declined with very limited recovery. The only explanation that can be put forward at this time is that monitoring wells installed near the East Landfill were not installed at ideal depths.

NMED noted an error in Table 2-1 in the April/July 2009 GWMR. This Table indicated a DTW measurement of 31.08 feet for July 2009 at EMW04. The true measurement for EMW04 in July 2009 was 104.64 feet bgs, with a corrected groundwater elevation of 6603.70 ft-msl. Table 2-1 of this GWMR has been corrected and is accurate.

### 4.2 OB/OD AREA GROUND-WATER ELEVATIONS

Table 4-3 tabulates OB/OD Area ground-water elevation data, and Figure 4-4 is the ground-water elevation contour map for October 2009. USACE developed ground-water elevation contours for the OB/OD area using GMS software. Ground-water appeared to flow in a northerly direction, approximately following the surface topography. Ground-water elevations were not measured during January 2010 due to snow cover in the OB/OD Area. Snow cover prevents entry into this area due to Unexploded Ordnance (UXO).

To a create ground-water contour map for the OB/OD Area, USACE developed assumptions about ground-water movement. These assumptions are: 1) ground water in formations of the Nutria Monocline (a.k.a., *the Hogback*) is not hydraulically connected to ground water in formations east of the Hogback; 2) monitoring well CMW20 contains base flow water; and 3) remaining monitoring wells are constructed in a contiguous formation(s) east of the Hogback, and this ground water is not hydraulically connected to ground water in the Hogback.

Monitoring wells KMW09, 10, 11, 12, and 13 are constructed in the Cretaceous or Jurassic formations associated with the Hogback (PMC 1999). The bedding planes of these formations dip steeply, between 42° and 64°, to the west and contain mudstone and claystone beds (the Mancos Shale), which potentially prevent horizontal ground-

water flow (NMT 2003). Measurements from these wells were not used to create a ground-water contour map.

USACE did not use ground-water elevation data from monitoring well CMW20, constructed in the un-named arroyo that dissects Parcel 3, to evaluate ground-water movement. CMW20 is seven feet deep, and water is most likely base flow in arroyo sediment and not hydraulically connected to ground water located in bedrock.

USACE created the October 2009 ground-water contour map shown in Figure 4-4 based only on the DTW measured in monitoring wells CMW02, 04, 07, 10, 14, 17, 19, 22, 23, 24, and 25. These monitoring wells appear to be constructed in one of two units, either the Painted Desert (Trpp) or the Sonsela (Trps) Members of the Triassic Petrified Forest Formation (PMC 1999). The geologic description given in well logs for these monitoring wells support this conclusion.

**Table 4-1: Northern Area Alluvial Ground Water Elevation**

Well ID	TOC ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl			
EMW01	6718.42	15-Apr-08	79.03	6639.37	24-Jul-08	79.42	6639.00	7-Oct-08	79.18	6639.24	Jan-09	NM	NM	13-Apr-09	79.27	6639.15	7-Jul-09	82.76	6635.66	12-Oct-09	84.62	6633.80	27-Jan-10	81.11	6637.31
EMW02	6702.44	15-Apr-08	30.55	6671.87	24-Jul-08	31.05	6671.39	7-Oct-08	30.86	6671.58	Jan-09	NM	NM	13-Apr-09	30.51	6671.93	7-Jul-09	31.08	6671.36	12-Oct-09	31.51	6670.93	27-Jan-10	31.23	6671.21
EMW03	6701.07	15-Apr-08	28.89	6672.16	24-Jul-08	27.15	6673.92	7-Oct-08	26.96	6674.11	Jan-09	NM	NM	13-Apr-09	38.87	6662.20	7-Jul-09	25.85	6675.22	12-Oct-09	28.89	6672.18	27-Jan-10	28.78	6672.29
EMW04	6708.35	15-Apr-08	71.39	6636.94	24-Jul-08	87.19	6621.16	7-Oct-08	80.88	6627.47	Jan-09	NM	NM	13-Apr-09	77.70	6630.65	7-Jul-09	104.65	6603.70	12-Oct-09	99.21	6609.14	27-Jan-10	103.16	6662.19
FW10	6708.38	15-Apr-08	41.92	6666.44	24-Jul-08	49.75	6658.63	7-Oct-08	49.15	6659.23	22-Jan-09	49.88	6658.5	13-Apr-09	49.25	6659.13	7-Jul-09	49.88	6658.50	12-Oct-09	49.20	6659.18	Jan-10	NM	NM
FW29	6670.93	15-Apr-08	29.87	6641.04	25-Jul-08	29.39	6641.54	Oct-08	NM	NM	Jan-09	NM	NM	Apr-09	NM	NM	7-Jul-09	28.72	6642.21	12-Oct-09	28.41	6642.52	24-Jan-10	30.24	6640.69
FW35	6711.06	15-Apr-08	15.20	6695.84	24-Jul-08	16.85	6694.21	7-Oct-08	17.97	6693.09	22-Jan-09	16.60	6694.46	14-Apr-09	16.41	6694.65	7-Jul-09	18.07	6692.99	12-Oct-09	20.66	6690.40	27-Jan-10	19.14	6691.92
MW01	6685.98	15-Apr-08	41.18	6645.47	25-Jul-08	41.29	6645.36	7-Oct-08	41.60	6645.05	22-Jan-09	41.41	6645.24	13-Apr-09	41.56	6644.42	7-Jul-09	41.64	6644.34	12-Oct-09	41.72	6644.26	27-Jan-10	41.86	6644.12
MW02	6685.20	15-Apr-08	37.91	6647.14	25-Jul-08	37.98	6647.07	7-Oct-08	38.21	6646.84	22-Jan-09	32.65	6652.4	16-Apr-09	38.45	6646.75	7-Jul-09	35.51	6649.69	12-Oct-09	38.62	6646.58	27-Jan-10	38.83	6646.37
MW03	6689.57	15-Apr-08	45.46	6644.11	25-Jul-08	45.46	6644.11	7-Oct-08	45.79	6643.78	22-Jan-09	45.57	6644	13-Apr-09	45.69	6643.88	7-Jul-09	45.70	6643.87	12-Oct-09	45.71	6643.86	27-Jan-10	45.84	6643.73
MW18D	6686.36	15-Apr-08	42.00	6644.36	25-Jul-08	41.28	6645.08	7-Oct-08	42.58	6643.78	22-Jan-09	42.22	6644.14	13-Apr-09	42.45	6643.91	7-Jul-09	42.44	6643.92	12-Oct-09	42.63	6643.73	Jan-10	NM	NM
MW20	6687.64	15-Apr-08	44.41	6643.23	Jul-09	NM	NM	7-Oct-08	44.78	6642.86	22-Jan-09	44.57	6643.07	13-Apr-09	44.59	6643.05	6-Jul-09	44.61	6643.03	12-Oct-09	44.74	6642.90	27-Jan-10	44.83	6642.81
MW22D	6684.56	15-Apr-08	42.00	6642.56	24-Jul-08	40.98	6643.58	7-Oct-08	41.40	6643.16	22-Jan-09	41.14	6643.42	13-Apr-09	41.20	6643.36	7-Jul-09	41.25	6643.31	12-Oct-09	41.45	6643.11	27-Jan-10	41.56	6643.00
MW22S	6684.66	15-Apr-08	40.77	6643.87	24-Jul-08	40.87	6643.79	7-Oct-08	41.20	6643.46	22-Jan-09	41.12	6643.54	13-Apr-09	41.06	6643.60	7-Jul-09	41.11	6643.55	12-Oct-09	41.32	6643.34	27-Jan-10	41.44	6643.22
SMW01	6669.96	15-Apr-08	28.40	6641.54	25-Jul-08	28.66	6641.30	25-Jul-08	28.54	6641.42	22-Jan-09	27.95	6642.01	13-Apr-09	27.85	6642.11	6-Jul-09	28.20	6641.76	12-Oct-09	28.90	6641.06	27-Jan-10	29.15	6640.81
TMW01	6711.84	15-Apr-08	34.59	6677.25	24-Jul-08	34.83	6677.01	7-Oct-08	35.23	6676.61	22-Jan-09	35.33	6676.51	13-Apr-09	35.40	6676.44	7-Jul-09	35.55	6676.29	12-Oct-09	35.74	6676.10	27-Jan-10	35.96	6675.88
TMW03	6702.45	15-Apr-08	56.65	6645.80	24-Jul-08	56.74	6645.71	7-Oct-08	56.84	6645.61	22-Jan-09	56.77	6645.68	13-Apr-09	56.79	6645.66	7-Jul-09	56.83	6645.62	12-Oct-09	56.81	6645.64	27-Jan-10	56.82	6645.63
TMW04	6700.89	15-Apr-08	56.20	6644.69	24-Jul-08	56.25	6644.64	7-Oct-08	56.34	6644.55	22-Jan-09	56.27	6644.62	13-Apr-09	56.30	6644.59	7-Jul-09	56.30	6644.59	12-Oct-09	56.29	6644.60	27-Jan-10	56.35	6644.54
TMW06	6690.63	15-Apr-08	46.66	6643.97	24-Jul-08	46.76	6643.87	7-Oct-08	46.97	6643.66	22-Jan-09	46.70	6643.93	13-Apr-09	46.81	6643.82	7-Jul-09	46.81	6643.82	12-Oct-09	46.76	6643.87	27-Jan-10	46.88	6643.75
TMW07	6690.68	15-Apr-08	46.28	6644.38	24-Jul-08	46.92	6643.76	Oct-08	NM	NM	Jan-09	NM	NM	13-Apr-09	46.95	6643.73	7-Jul-09	48.36	6642.32	12-Oct-09	47.76	6642.92	27-Jan-10	47.85	6642.83
TMW08	6680.29	15-Apr-08	36.02	6644.27	25-Jul-08	36.09	6644.20	7-Oct-08	36.32	6643.97	22-Jan-09	36.21	6644.08	13-Apr-09	36.15	6644.14	7-Jul-09	36.22	6644.07	12-Oct-09	36.20	6644.09	27-Jan-10	36.44	6643.85
TMW10	6680.06	15-Apr-08	36.26	6643.80	25-Jul-08	36.46	6643.60	7-Oct-08	36.74	6643.32	22-Jan-09	36.54	6643.52	13-Apr-09	36.55	6643.51	7-Jul-09	36.61	6643.45	12-Oct-09	36.83	6643.23	27-Jan-10	36.99	6643.07
TMW11	6718.32	15-Apr-08	66.59	6651.73	24-Jul-08	66.70	6651.62	7-Oct-08	66.80	6651.52	22-Jan-09	66.85	6651.47	13-Apr-09	66.71	6651.61	6-Jul-09	66.66	6651.66	12-Oct-09	66.58	6651.74	27-Jan-10	66.18	6652.14
TMW13	6707.52	15-Apr-08	59.72	6647.80	24-Jul-08	59.82	6647.70	7-Oct-08	59.91	6647.61	22-Jan-09	59.91	6647.61	13-Apr-09	59.89	6647.63	7-Jul-09	59.95	6647.57	12-Oct-09	59.92	6647.60	27-Jan-10	59.82	6647.70
TMW15	6713.90	15-Apr-08	64.14	6649.76	24-Jul-08	64.26	6649.64	7-Oct-08	64.37	6649.53	22-Jan-09	64.40	6649.5	13-Apr-09	64.31	6649.59	7-Jul-09	64.38	6649.52	12-Oct-09	64.30	6649.60	27-Jan-10	64.05	6649.85
TMW21	6695.16	15-Apr-08	50.22	6644.94	24-Jul-08	50.31	6644.85	7-Oct-08	50.50	6644.66	22-Jan-09	50.33	6644.83	13-Apr-09	50.37	6644.79	7-Jul-09	50.42	6644.74	12-Oct-09	50.42	6644.74	27-Jan-10	50.45	6644.71
TMW22	6691.79	15-Apr-08	49.05	6642.72	Jul-09	NM	NM	7-Oct-08	49.21	6642.58	22-Jan-09	49.01	6642.78	13-Apr-09	49.03	6642.76	7-Jul-09	48.98	6642.81	12-Oct-09	48.79	6643.00	27-Jan-10	48.85	6642.94
TMW23	6687.71	15-Apr-08	45.79	6642.12	25-Jul-08	45.89	6642.04	7-Oct-08	46.05	6641.88	22-Jan-09	46.30	6641.63	13-Apr-09	45.79	6642.14	7-Jul-09	45.76	6642.17	12-Oct-09	45.58	6642.13	27-Jan-10	45.72	6641.99
TMW24	6680.38	15-Apr-08	39.81	6640.55	25-Jul-08	39.96	6640.42	7-Oct-08	39.92	6640.46	22-Jan-09	39.60	6640.78	13-Apr-09	39.48	6640.90	7-Jul-09	39.43	6640.95	12-Oct-09	39.28	6641.10	27-Jan-10	39.34	6641.04
TMW25	6672.90	15-Apr-08	39.28	6633.62	24-Jul-08	39.31	6633.59	7-Oct-08	39.55	6633.35	22-Jan-09	39.22	6633.68	14-Apr-09	39.09	6633.81	6-Jul-09	39.15	6633.75	12-Oct-09	39.29	6633.61	27-Jan-10	39.20	6633.70
TMW26	6677.74	15-Apr-08	26.27	6651.45	25-Jul-08	26.09	6651.65	7-Oct-08	28.10	6649.64	22-Jan-09	28.12	6649.62	13-Apr-09	26.41	6651.33	6-Jul-09	26.24	6651.50	12-Oct-09	26.62	6651.12	Jan-10	NM	NM
TMW27	6668.16	15-Apr-08	29.09	6639.07	24-Jul-08	28.10	6640.06	7-Oct-08	28.41	6639.75	22-Jan-09	28.23	6639.93	13-Apr-09	27.94	6640.22	6-Jul-09	28.06	6640.10	12-Oct-09	28.41	6639.75	27-Jan-10	28.24	6639.92
TMW28	6689.19	15-Apr-08	16.04	6673.15	25-Jul-08	16.96	6672.23	7-Oct-08	17.56	6671.63	Jan-09	NM	NM	13-Apr-09	17.09	6672.10	7-Jul-09	17.79	6671.40	12-Oct-09	18.70	6670.49	27-Jan-10	18.66	6670.53
TMW29	6702.93	15-Apr-08	56.87	6646.06	24-Jul-08	57.10	6645.83	7-Oct-08	57.10	6645.83	22-Jan-09	57.06	6645.87	13-Apr-09	57.06	6645.87	7-Jul-09	57.11	6645.82	12-Oct-09	57.09	6645.84	27-Jan-10	57.15	6645.78
TMW31S	6710.78																								
TMW33	6686.76																								
TMW34	6687.39																								
TMW35	6686.66																								
Wingate89	6663.72	Apr-08	NM	NM	Jul-09	NM	NM	Oct-08	NM	NM	23-Jan-09	15.17	6648.55	13-Apr-09	14.91	6648.81	7-Jul-09	15.04	6648.68	Oct-10	NM	NM	27-Jan-10	15.25	6648.47
Wingate90	6656.46	15-Apr-08	13.20	6643.24	Jul-09	NM	NM	7-Oct-08	13.81	6642.65	23-Jan-09	13.59	6642.87	13-Apr-09	13.27	6643.19	7-Jul-09	13.31	6643.15	Oct-10	NM	NM	27-Jan-10	13.58	6642.88
Wingate91	6659.73	15-Apr-08	13.76	6643.99	Jul-09	NM	NM	7-Oct-08	14.41	6643.34	23-Jan-09	14.20	6643.59	13-Apr-09	13.90	6643.83	7-Jul-09	14.13	6643.62	Oct-10	NM	NM	Jan-10	NM	NM

NM: Not Measured  
ft-btoc: Feet Below Top of Casing  
msl: Mean Sea Level  
DTW: Depth to Water  
TOC: Top of Casing  
TMW 23 elevation was adjusted due to pump removal  
TMW 31S, TMW33, TMW34, and TMW 35 were installed as part of Parcel 11 and 22 investigations

**Table 4-2: Northern Area Bedrock Ground Water Elevation**

Well ID	TOC ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl	Date	DTW ft-btoc	Water Level ft-msl			
<b>Northern Area Bedrock Monitoring Wells (Lower Sandstone)</b>																									
TMW02	6705.31	15-Apr-08	54.67	6650.64	24-Jul-08	54.83	6650.48	7-Oct-08	54.95	6650.36	22-Jan-09	54.89	6650.42	13-Apr-09	54.96	6650.35	7-Jul-09	55.01	6650.30	12-Oct-09	55.00	6650.31	27-Jan-10	55.10	6650.21
<b>Northern Area Bedrock Monitoring Wells (Lower Sandstone)</b>																									
TMW05	6714.65	15-Apr-08	36.36	6678.29	24-Jul-08	36.77	6677.88	7-Oct-08	36.80	6677.85	22-Jan-09	dry	dry	13-Apr-09	dry	dry	7-Jul-09	dry	dry	12-Oct-09	dry	dry	27-Jan-10	dry	dry
TMW14A	6723.79	15-Apr-08	63.73	6660.06	24-Jul-08	63.96	6659.83	7-Oct-08	64.09	6659.70	22-Jan-09	63.91	6659.88	14-Apr-09	63.40	6660.39	7-Jul-09	63.27	6660.52	13-Oct-09	62.61	6661.18	27-Jan-10	62.10	6661.69
TMW16	6714.12	15-Apr-08	55.48	6658.90	24-Jul-08	55.55	6658.83	7-Oct-08	55.57	6658.81	22-Jan-09	55.48	6658.90	13-Apr-09	55.45	6658.93	7-Jul-09	54.40	6659.98	12-Oct-09	55.31	6658.81	27-Jan-10	54.04	6660.08
TMW17	6720.16	15-Apr-08	62.18	6657.98	25-Jul-08	62.19	6657.97	7-Oct-08	62.35	6657.81	22-Jan-09	62.19	6657.97	13-Apr-09	62.04	6658.12	7-Jul-09	61.08	6659.08	12-Oct-09	62.05	6658.11	Jan-10	NM	NM
TMW18	6713.46	15-Apr-08	50.79	6662.67	25-Jul-08	54.81	6658.65	7-Oct-08	54.27	6659.19	22-Jan-09	54.28	6659.18	13-Apr-09	54.09	6659.37	7-Jul-09	54.28	6659.18	12-Oct-09	54.28	6659.18	27-Jan-10	54.28	6659.18
TMW19	6700.57	15-Apr-08	41.82	6658.98	25-Jul-08	42.01	6658.79	7-Oct-08	42.08	6658.72	22-Jan-09	41.92	6658.88	13-Apr-09	41.95	6658.85	7-Jul-09	42.09	6658.71	12-Oct-09	42.14	6658.43	27-Jan-10	42.09	6658.48
TMW30	6714.58																					27-Jan-10	38.80	6675.78	
TMW31D	6710.06																					27-Jan-10	35.11	6674.95	
TMW32	6709.27																					27-Jan-10	38.24	6671.03	
TMW36	6702.91																					27-Jan-10	24.95	6677.96	
TMW37	6713.22																					27-Jan-10	44.43	6668.79	

NM: Not Measured

ft-btoc: Feet Below Top of Casing

msl: Mean Sea Level

DTW: Depth to Water

TOC: Top of Casing

TMW16, TMW18, and TMW19 elevations was adjusted due to Bennet Pump Installation

TMW 30, TMW31D, TMW32, TMW36 and TMW37 were installed during the Parcel 22 investigation



**Table 4 3: Open Burn/Open Detonation Area Ground Water Elevation**

Well ID	TOC msl	ft- Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl	Date	DTW ft-btoc	Water Level ft- msl
CMW02	7258.00	15-Apr-08	10.49	7247.51	24-Jul-08	10.68	7247.32	7-Oct-08	15.13	7242.87	Jan-09	NM	NM	13-Apr-09	14.05	7243.95	7-Jul-09	13.90	7244.10	15-Oct-09	13.60	7244.40	Jan-10	NM	NM
CMW04	7251.15	15-Apr-08	43.31	7207.84	25-Jul-08	43.51	7207.64	7-Oct-08	43.79	7207.36	Jan-09	NM	NM	13-Apr-09	44.36	7206.79	7-Jul-09	44.87	7206.28	15-Oct-09	45.13	7206.02	Jan-10	NM	NM
CMW07	7235.16	15-Apr-08	37.69	7197.47	24-Jul-08	37.69	7197.47	7-Oct-08	37.99	7197.17	Jan-09	NM	NM	13-Apr-09	38.15	7197.01	7-Jul-09	38.35	7196.81	15-Oct-09	38.95	7196.21	Jan-10	NM	NM
CMW10	7179.31	15-Apr-08	24.03	7155.26	24-Jul-08	64.10	7115.21	7-Oct-08	Dry	Dry	Jan-09	NM	NM	13-Apr-09	50.16	7129.15	7-Jul-09	68.00	7111.31	15-Oct-09	65.02	7114.29	Jan-10	NM	NM
CMW14	7153.06	15-Apr-08	28.87	7124.17	24-Jul-08	27.83	7125.23	7-Oct-08	27.13	7125.93	Jan-09	NM	NM	13-Apr-09	29.39	7123.67	7-Jul-09	29.39	7123.67	15-Oct-09	29.82	7123.24	Jan-10	NM	NM
CMW17	7145.18	15-Apr-08	12.27	7132.89	24-Jul-08	12.11	7133.07	7-Oct-08	16.80	7128.38	Jan-09	NM	NM	13-Apr-09	21.21	7123.97	7-Jul-09	22.09	7123.09	Oct-10	NM	NM	Jan-10	NM	NM
CMW18	7158.24	15-Apr-08	34.50	7123.72	24-Jul-08	37.38	7120.86	7-Oct-08	38.87	7119.37	Jan-09	NM	NM	13-Apr-09	39.71	7118.53	7-Jul-09	40.45	7117.79	Oct-10	NM	NM	Jan-10	NM	NM
CMW19	7129.85	15-Apr-08	19.78	7110.05	24-Jul-08	20.65	7109.20	7-Oct-08	22.14	7107.71	Jan-09	NM	NM	13-Apr-09	22.10	7107.75	7-Jul-09	24.20	7105.65	15-Oct-09	24.82	7105.03	Jan-10	NM	NM
CMW20	7194.68	15-Apr-08	4.34	7190.32	Jul-09	NM	NM	22-Oct-08	5.89	7188.79	Jan-09	NM	NM	13-Apr-09	4.95	7189.73	7-Jul-09	6.57	7188.11	Oct-10	NM	NM	Jan-10	NM	NM
CMW21	7088.19	15-Apr-08	17.32	7070.85	25-Jul-08	22.06	7066.13	7-Oct-08	23.33	7064.86	Jan-09	NM	NM	13-Apr-09	23.02	7065.17	7-Jul-09	23.50	7064.69	Oct-10	NM	NM	Jan-10	NM	NM
CMW22	7081.94	15-Apr-08	115.25	6966.67	24-Jul-08	114.66	6967.28	7-Oct-08	116.56	6965.38	Jan-09	NM	NM	13-Apr-09	114.54	6967.40	7-Jul-09	114.61	6967.33	15-Oct-09	114.53	6967.41	Jan-10	NM	NM
CMW23	7035.58	15-Apr-08	97.23	6938.33	24-Jul-08	97.42	6938.16	7-Oct-08	97.26	6938.32	Jan-09	NM	NM	13-Apr-09	97.13	6938.45	7-Jul-09	97.27	6938.31	15-Oct-09	97.15	6938.43	Jan-10	NM	NM
CMW24	7099.68	15-Apr-08	45.45	7054.21	24-Jul-08	45.50	7054.18	7-Oct-08	45.51	7054.17	Jan-09	NM	NM	13-Apr-09	45.44	7054.24	7-Jul-09	45.78	7053.90	15-Oct-09	45.56	7054.12	Jan-10	NM	NM
CMW25	7007.52	15-Apr-08	33.73	6973.79	24-Jul-08	33.93	6973.59	7-Oct-08	34.32	6973.20	Jan-09	NM	NM	13-Apr-09	35.39	6972.13	7-Jul-09	35.78	6971.74	15-Oct-09	36.47	6971.05	Jan-10	NM	NM
FW24	6999.19	Apr-08	NM	NM	Jul-09	NM	NM	7-Oct-08	24.04	6975.15	Jan-09	NM	NM	13-Apr-09	24.02	6975.17	7-Jul-09	24.07	6975.12	Oct-10	NM	NM	Jan-10	NM	NM
FW31	6832.47	15-Apr-08	40.63	6791.82	25-Jul-08	40.76	6791.71	7-Oct-08	40.99	6791.48	Jan-09	NM	NM	13-Apr-09	41.03	6791.44	7-Jul-09	41.13	6791.34	13-Oct-09	41.41	6791.06	24-Jan-10	41.37	6791.10
FW38	7172.02	15-Apr-08	9.24	7162.76	24-Jul-08	4.59	7167.43	7-Oct-08	dry	dry	Jan-09	NM	NM	13-Apr-09	dry	dry	7-Jul-09	dry	dry	15-Oct-09	dry	dry	Jan-10	NM	NM
KMW09	7187.93	15-Apr-08	39.09	7148.84	24-Jul-08	38.56	7149.37	7-Oct-08	38.73	7149.20	Jan-09	NM	NM	13-Apr-09	38.82	7149.11	7-Jul-09	39.20	7148.73	15-Oct-09	39.21	7148.72	Jan-10	NM	NM
KMW10	7131.38	15-Apr-08	166.54	6964.82	24-Jul-08	166.71	6964.67	7-Oct-08	166.88	6964.50	Jan-09	NM	NM	13-Apr-09	166.74	6964.64	7-Jul-09	166.75	6964.63	15-Oct-09	166.84	6964.54	Jan-10	NM	NM
KMW11	7108.78	15-Apr-08	30.65	7078.13	24-Jul-08	30.88	7077.90	7-Oct-08	31.21	7077.57	Jan-09	NM	NM	13-Apr-09	31.24	7077.54	7-Jul-09	31.80	7076.98	15-Oct-09	32.24	7076.54	Jan-10	NM	NM
KMW12	7193.08	15-Apr-08	47.93	7145.13	24-Jul-08	48.39	7144.69	7-Oct-08	48.38	7144.70	Jan-09	NM	NM	13-Apr-09	47.98	7145.10	7-Jul-09	48.43	7144.65	15-Oct-09	48.54	7144.54	Jan-10	NM	NM

NM: Not Measured  
 ft-btoc: Feet Below Top of Casing  
 msl: Mean Sea Level  
 DTW: Depth to Water  
 TOC: Top of Casing

Table 4-3

**Table 4-4: USGS Piezometer Ground Water Elevation**

USGS Rio Puerco Study								
Piezometer	Easting	Northing	Ground Elevation (msl)	Stick-Up (ft)	TOC Elevation (msl)	DTW (TOC)	DTW (bgs)	Groundwater Elevation (msl)
PZ01	2499236.22	1645310.72	6674.48	2.76	6677.24	27.09	24.33	6650.15
PZ02	2499258.64	1645426.78	6672.61	2.37	6674.98	23.70	21.33	6651.28
PZ03	2499288.54	1645502.88	6676.84	2.58	6679.42	27.22	24.64	6652.20
PZ04	2498592.56	1645288.26	6674.14	2.52	6676.66	28.25	25.73	6648.41
PZ05	2498263.13	1646574.66	6671.54	2.62	6674.15	20.56	17.94	6653.60
PZ06	2498718.95	1646327.75	6673.25	2.80	6676.05	18.90	16.10	6657.15
PZ07	2500958.18	1645600.75	6682.05	2.52	6684.57	14.77	12.25	6669.80
PZ08	2500744.34	1645511.30	6684.10	2.72	6686.82	18.42	15.70	6668.40
PZ09	2495520.51	1648138.17	6651.21	2.38	6653.59	15.82	13.44	6637.77
PZ10	2495406.66	1648008.28	6654.86	2.43	6657.29	19.67	17.24	6637.62

TOC: Top of Casing

bgs: Below Ground Surface

ft: Feet

msl: Mean Sea Level

USGS: United States Geological Survey

Coordinates System: New Mexico State Plan, North American Datum 83

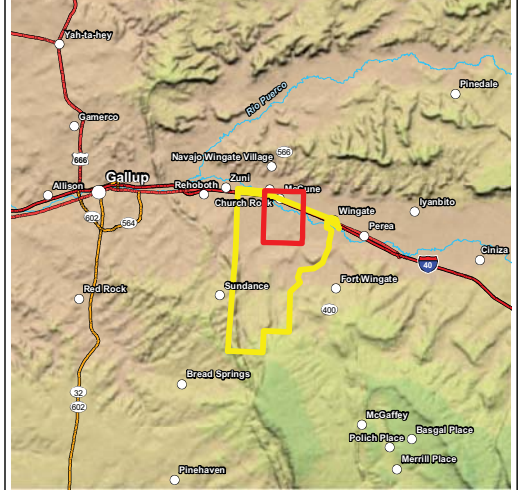
Source: U.S. Geological Survey, New Mexico Water Science Center (USGS 2009)



**FWDA SURFACE GEOLOGY**

- QAL, QUATERNARY ALLUVIAL DEPOSITS
- QCL, QUATERNARY COLLUVIAL AND GRAVEL DEPOSITS
- TRPP, PETRIFIED FOREST FORMATION - PAINTED DESERT MEMBER

**Ft. Wingate Army Depot Property Boundary Indicated in Yellow Northern Area Alluvial Ground Water Map Area in Red**



- ◆ NORTHERN AREA ALLUVIAL MONITORING WELLS
- ▲ NORTHERN AREA BEDROCK MONITORING WELLS
- FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- GROUNDWATER ELEVATION CONTOUR (3 FT INTERVAL)
- - - GROUNDWATER ELEVATION CONTOUR (ESTIMATED) (3 FT INTERVAL)
- SOLID WASTE MANAGEMENT UNIT (SWMU)
- HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- BUILDINGS
- FWDA PROPERTY BOUNDARY, FEB 2002
- PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 4-1**  
**October 2009 Northern Area Alluvial Ground Water Contour Map**

0.25 Miles  
0.25 Kilometers

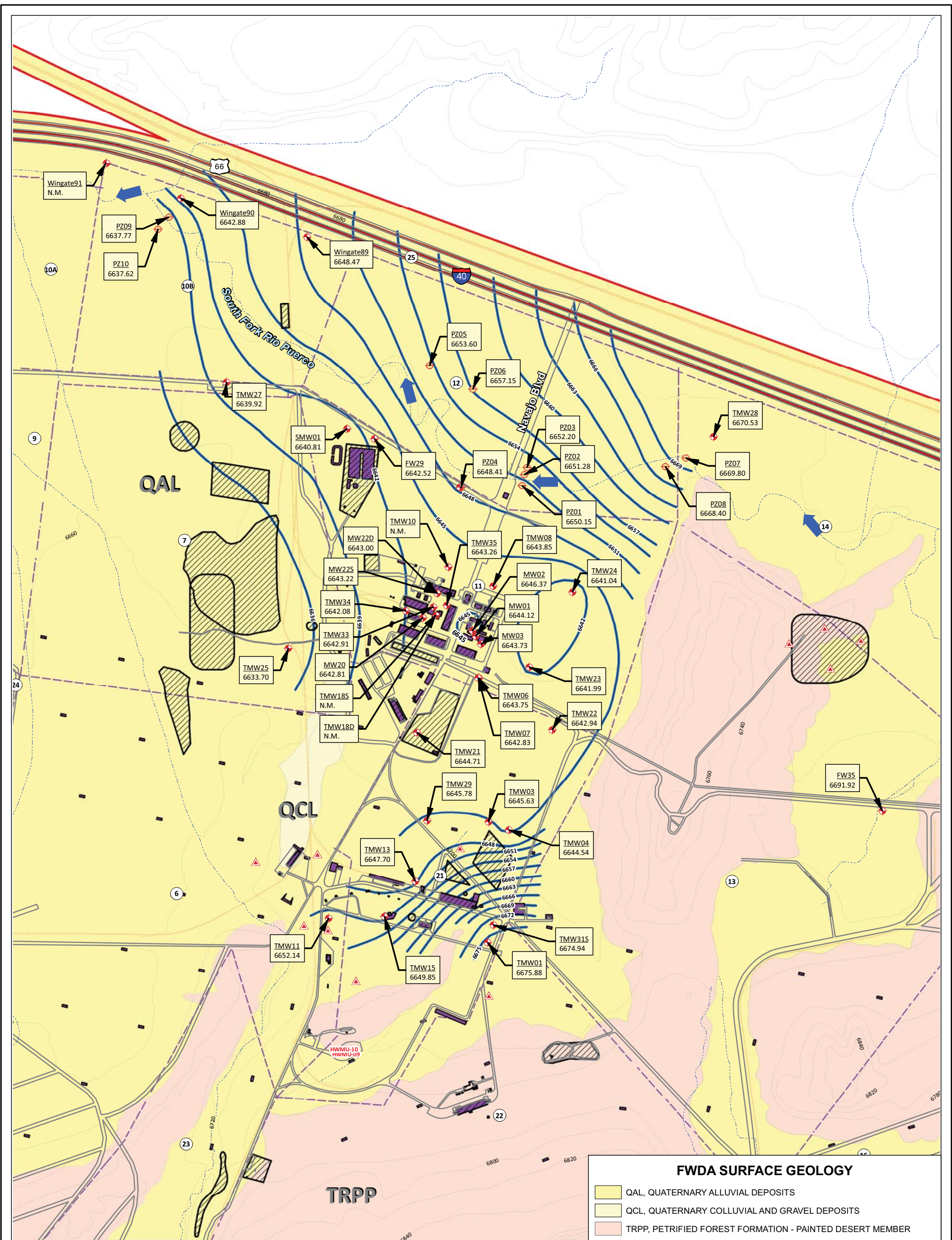
State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.

Map Scale: 1:6,000 (1" = 500')  
Map Date: December 7, 2009

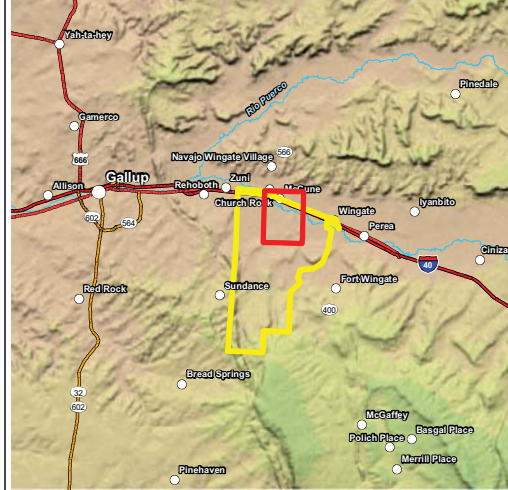
Ground water measurements in US feet;  
Dry, no water in wells; N.M., not measured.

Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry



Ft. Wingate Army Depot Property Boundary Indicated in Yellow Northern Area Alluvial Ground Water Map Area in Red



- NORTHERN AREA ALLUVIAL MONITORING WELLS
- NORTHERN AREA ALLUVIAL PIEZOMETERS
- NORTHERN AREA BEDROCK MONITORING WELLS
- FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- GROUNDWATER ELEVATION CONTOUR (3 FT INTERVAL)
- SOLID WASTE MANAGEMENT UNIT (SWMU)
- HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- BUILDINGS
- FWDA PROPERTY BOUNDARY, FEB 2002
- PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 4-2**  
January 2010 Northern Area Alluvial Ground Water Contour Map

0.25 Miles  
0.25 Kilometers

State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.

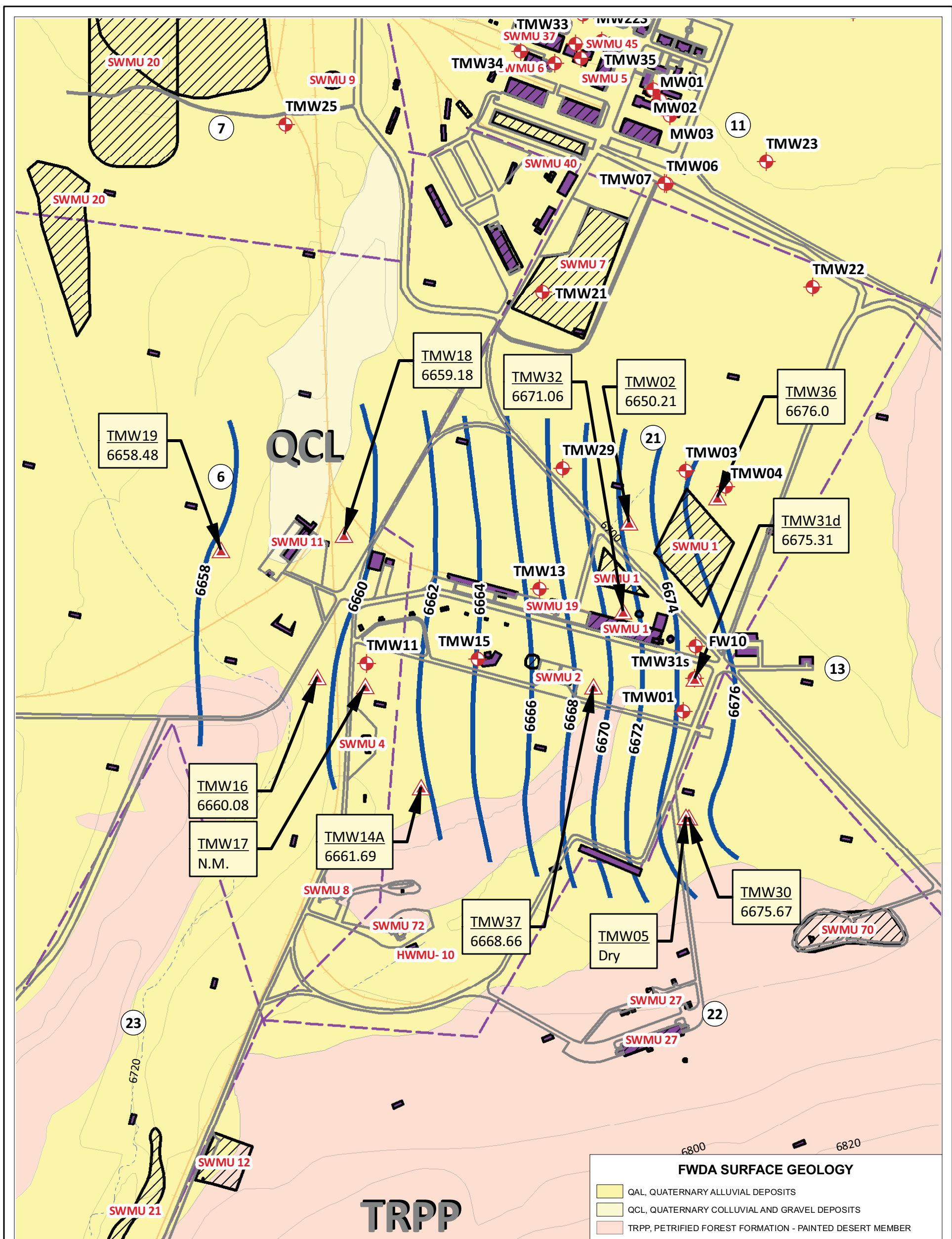
Map Scale: 1:6,000 (1" = 500')  
Map Date: December 7, 2009

Ground water measurements in US feet;  
Dry, no water in wells; N.M., not measured.

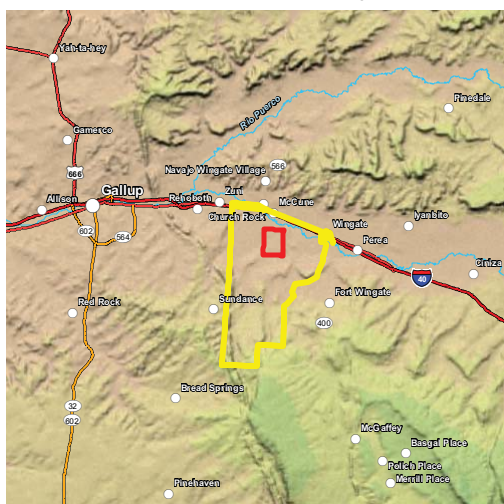
Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry

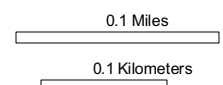
US Army Corps of Engineers - Albuquerque District



Ft. Wingate Army Depot Property Boundary Indicated in Yellow Northern Area Bedrock Ground Water Map Area in Red



**FIGURE 4-3**  
January 2010 Northern Area Bedrock Ground Water Contour Map



State Plane Coordinate System, New Mexico West, North American Datum 1983. Units in US Survey Feet above Mean Sea Level.

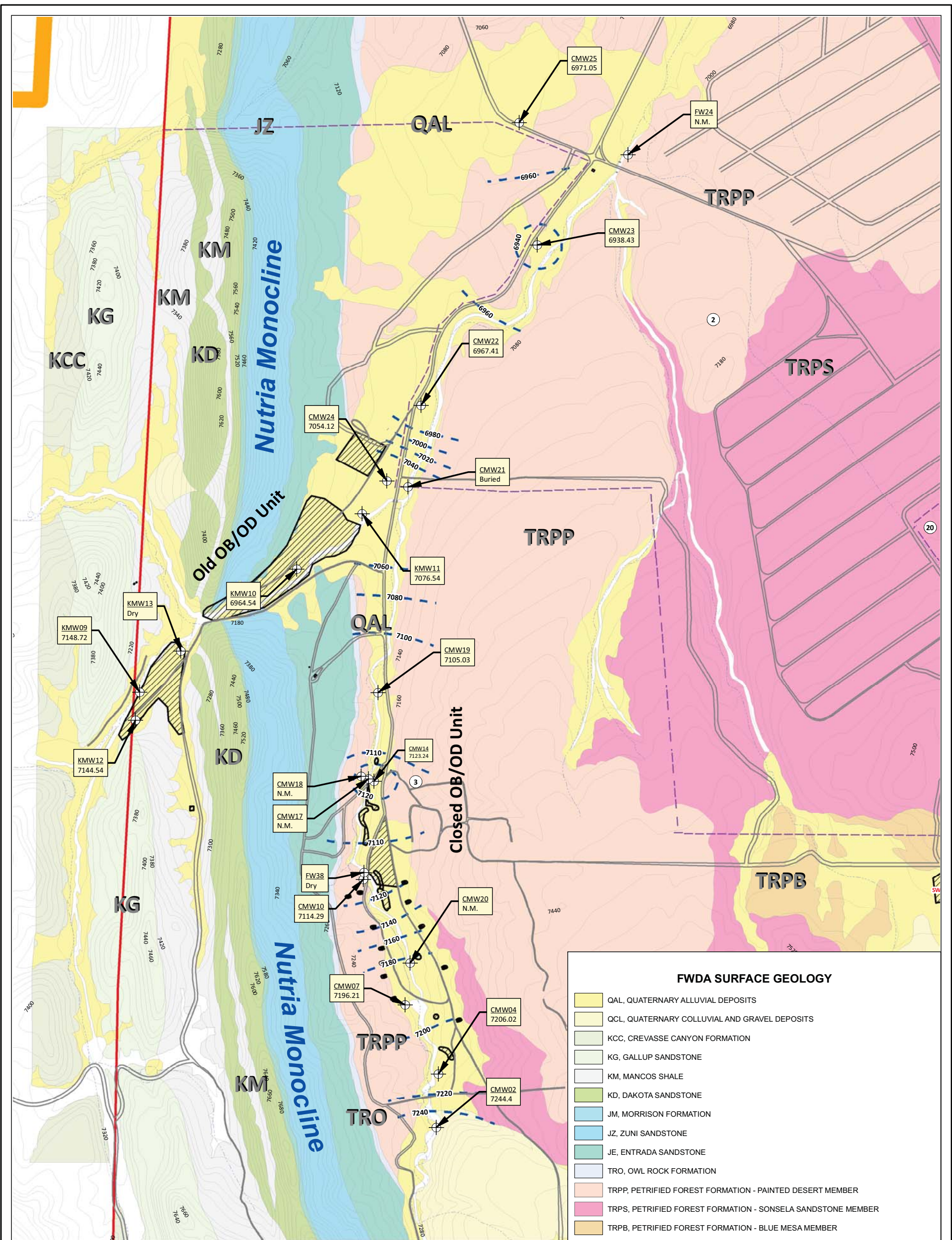
Map Scale 1:6,000 (1"=500')  
Map Date: June 4, 2010

Ground water measurements in US feet; Dry, no water in wells; N.M., not measured.

Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry

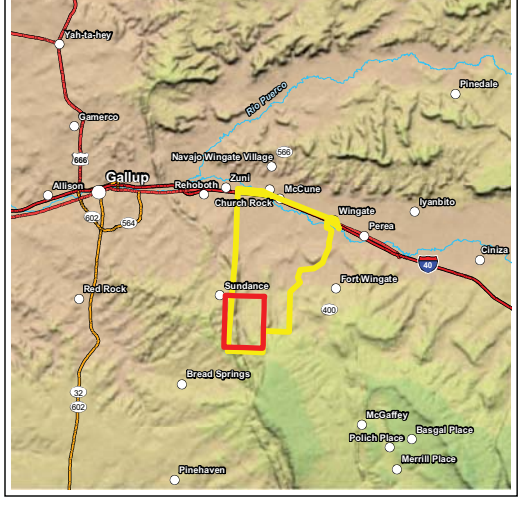




**FWDA SURFACE GEOLOGY**

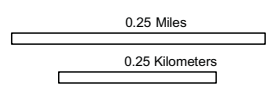
[Yellow]	QAL, QUATERNARY ALLUVIAL DEPOSITS
[Light Yellow]	QCL, QUATERNARY COLLUVIAL AND GRAVEL DEPOSITS
[Light Green]	KCC, CREVASSE CANYON FORMATION
[Green]	KG, GALLUP SANDSTONE
[Light Blue]	KM, MANCOS SHALE
[Blue]	KD, DAKOTA SANDSTONE
[Light Blue]	JM, MORRISON FORMATION
[Blue]	JZ, ZUNI SANDSTONE
[Teal]	JE, ENTRADA SANDSTONE
[Light Purple]	TRO, OWL ROCK FORMATION
[Pink]	TRPP, PETRIFIED FOREST FORMATION - PAINTED DESERT MEMBER
[Magenta]	TRPS, PETRIFIED FOREST FORMATION - SONSELA SANDSTONE MEMBER
[Orange]	TRPB, PETRIFIED FOREST FORMATION - BLUE MESA MEMBER

Ft. Wingate Army Depot Property Boundary Indicated in Yellow Northern Area Bedrock Ground Water Map Area in Red



- PIEZOMETERS
- NORTHERN AREA ALLUVIAL MONITORING WELLS
- NORTHERN AREA BEDROCK MONITORING WELLS
- FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- GROUNDWATER ELEVATION CONTOUR (20 FT INTERVAL) (ESTIMATED)
- SOLID WASTE MANAGEMENT UNIT (SWMU)
- HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- BUILDINGS
- FWDA PROPERTY BOUNDARY, FEB 2002
- PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 4-4**  
October 2009 OB/OD Area  
Ground Water Contour Map



State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.  
Map Scale: 1:12,000 (1" = 1000')  
Map Date: June 4, 2010

Ground water measurements in US feet;  
Dry, no water in wells; N.M., not measured.

Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry



## 5.0 GROUND-WATER CHEMICAL ANALYTICAL DATA RESULTS

On 12 October 2009, USACE mobilized to the FWDA facility to collect ground-water samples. Ground-water samples were collected from 56 monitoring wells. USACE collected samples by low-flow technique, by low-flow with Zone Isolation Sampling Technology (ZIST), by pumping or bailing monitoring wells dry, or by removing three times the volume of water in the casing and annular space with pumps or bailers. Monitoring wells having low-flow pumps, and low-flow pumps with ZIST assemblies, were low-flow purged in accordance with the NMED-approved GWMP (NMED 2001). USACE monitored the drawdown of water in monitoring wells sampled using the low-flow technique to ensure that drawdown did not exceed 0.3 feet while purging and sampling.

During the low-flow purge cycle, USACE monitored ground-water quality parameters and recorded: Dissolved Oxygen (DO) in mg/L, turbidity in Nephelometric Turbidity Units (NTU), conductivity in micro-Siemens per centimeter (uS/cm), pH in Standard Units (SU), and temperature in degrees Celsius (°C). USACE monitored parameters until purge water parameters stabilized within the following specifications: turbidity ( $\pm 10\%$ ), DO ( $\pm 10\%$ ), conductance ( $\pm 3\%$ ), temperature ( $\pm 10\%$ ), and pH ( $\pm 0.5$  unit). Ground-water parameters, except for turbidity, were monitored using a transparent flow-through cell attached to the water-quality meter. USACE measured turbidity using a separate, hand-held meter. Parameter measurements were recorded on Sampling Data Forms. Appendix D contains copies of Well Sampling Data Forms.

USACE could not purge several monitoring wells using the low-flow purging technique due to extremely limited formation discharge rates. These monitoring wells were purged and sampled with dedicated Bennett pumps, a 12-volt-battery pump, or disposable bailers. USACE collected samples from these wells after three volumes of water standing in the well casing were removed, or, if the monitoring well emptied before three volumes were removed, USACE collected samples the following day when formation water refilled the well casing. Table 5-16 contains purge records for all monitoring wells.

USACE measured three sets of ground-water quality parameters in monitoring wells that were pumped or hand-bailed. Ground water was poured from the bailer directly into a graduated beaker, and parameters were measured with hand-held meters and recorded on Well Sampling Data Forms. When pumps were used, the graduated beaker was filled via the discharge tube of the pump, and parameters were measured and recorded.

USACE collected samples when ground-water parameters stabilized. Ground-water samples were collected in their respective bottles, preserved as specified in the GWMP, placed in a cooler, and picked up by ARS Laboratory Services at the end of each day. When laboratory ground-water sample chemical results were received, USACE submitted the results to Laboratory Data Consultants, Inc. (LDC) for independent validation. LDC performed the independent validation and compared validated results to applicable regulatory standards.

Four criteria are used in the ground-water monitoring program to determine if a particular chemical constituent exceeds a regulatory requirement or health standard (Section 3.0, Regulatory Criteria). Results are compared to MCLs, NMWQCC standards, EPA Regional Screening Levels (RSL), and the Permit. Because no New Mexico or Federal promulgated health standard exists for perchlorate in ground water, the Permit states that 6 µg/L is the maximum allowable concentration of perchlorate. All remaining chemical constituents are compared to the most stringent MCL or NMWQCC standard. In the event that no promulgated MCL or NMWQCC standards exist for a specific constituent, the RSL is used. If a specific constituent has both a carcinogenic and non-carcinogenic RSL, the most stringent value of the two applies.

## 5.1 NORTHERN AREA SAMPLING RESULTS

Northern Area monitoring wells have prefixes TMW, MW, SMW, and EMW and include monitoring wells FW10, FW31, and FW35. Ground-water samples collected from these monitoring wells were analyzed for constituents/constituent groups tabulated in Table 2-1. Tables 5-1 through Table 5-8 present the ground-water sample results. Tables 5-9 through 5-15 compare the results from the past three sampling events (April 2008, October 2008, and April 2009) to current results. The following paragraphs summarize constituents detected in ground-water samples collected from monitoring wells located in the Northern Area during October 2009.

### 5.1.1 Nitrate and Nitrite

Table 5-1 tabulates the results for nitrate and nitrite, and a nitrate isoconcentration contour map is presented in Figure 5-1. For nitrate and nitrite, the MCLs were the most stringent regulatory health standard. MCLs for nitrate and nitrite are 10.0 and 1.0 mg/L, respectively. Nitrate was detected above the MCL in ground-water samples collected from monitoring wells MW03, MW20, MW22D, MW22S, TMW02, TMW03, TMW04, TMW08, and TMW23. The highest nitrate concentration detected was 165 mg/L from the ground-water sample collected from monitoring well TMW03.

Nitrite was detected above the MCL in ground-water samples collected from monitoring wells EMW04, MW20, and TMW08. The highest nitrite concentration detected was 4.38 mg/L in the ground-water sample collected from monitoring well MW20.

### 5.1.2 Total Explosives

Table 5-2 tabulates the results for total explosives, and Figure 5-2 presents a Hexhydro-1,3,5-trinitro-1,3,5-triazine (RDX) isoconcentration contour map. Currently, MCL or NMWQCC standards do not exist for the explosives detected; therefore, the RSLs were used. RDX, 2, 4-dinitrotoluene, and nitrobenzene were detected above their associated RSL. RDX, 2, 4-dinitrotoluene, and nitrobenzene have a RSL of 0.61 µg/L, 0.22 µg/L, and 3.4 µg/L, respectively. The groundwater sample collected from TMW03 contained the highest concentrations for explosive compounds with RDX detected at 370 µg/L, 2, 4-dinitrotoluene detected at 0.33 µg/L, and nitrobenzene detected at 4.1 µg/L.

Other explosive compounds were detected in ground-water samples but at concentrations below regulatory health standards. Table 5-2 presents all explosive



compounds detected below and above regulatory health standards. Because RDX was the most spatially prevalent compound detected in ground-water samples, USACE used RDX results to construct the isoconcentration contour map in Figure 5-2 to represent the explosives plume.

### 5.1.3 *Perchlorate*

Results for perchlorate are tabulated in Table 5-3 and presented in Figure 5-2. USACE compared Perchlorate to the value noted in the Permit, which is 6 µg/L. The ground-water sample collected from monitoring well TMW01 contained perchlorate at a concentration of 260 µg/L. This was the only sample with a result that exceeded 6 µg/L. Perchlorate was also detected in the ground-water samples collected from monitoring wells EMW01, TMW01, TMW02, TMW03, TMW04, and TMW11, but the results measured below 6 µg/L.

### 5.1.4 *Volatile Organic Compounds*

Table 5-4 tabulates the results for Volatile Organic Compounds (VOC). Two compounds were detected above a regulatory health standard: 1, 2-dichloroethane (1, 2-DCA) and toluene. The most stringent regulatory health standard for 1, 2-DCA is the MCL standard at 5.0 µg/L, and the most stringent regulatory health standard for toluene is the NMWQCC standard at 750 µg/L. USACE detected 1, 2-DCA in ground-water samples collected from monitoring wells MW18D and MW20, with a concentration of 120 µg/L and 10 µg/L, respectively. Toluene was detected in the ground-water sample collected from monitoring well TMW18 at a concentration of 1100 µg/L. Other VOC compounds were detected in ground-water samples, but at concentrations below regulatory health standards. An isoconcentration contour map was not constructed for VOCs detected in ground-water samples; however, Figure 5-3 shows the results.

### 5.1.5 *Semi-Volatile Organic Compounds*

Table 5-5 tabulates the results for Semi-Volatile Organic Compounds (SVOC). One compound, phenol, was detected above a regulatory health standard. The NMWQCC standard of 5.0 µg/L is the most stringent regulatory health standard for phenol. Phenol was detected above the NMWQCC standard from ground-water samples collected from monitoring wells TMW18 and TMW19, with a concentration of 160 µg/L and 180 µg/L, respectively. Other SVOC compounds were detected in ground-water samples but at concentrations below regulatory health standards. An isoconcentration map was not constructed for SVOC compounds detected in ground-water samples. However, Figure 5-3 shows the results.

### 5.1.6 *Diesel and Gasoline Range Organics*

Diesel Range Organic (DRO) and Gasoline Range Organic (GRO) ground-water samples were collected from monitoring wells MW18D, MW20, MW22S, and MW22D. The GWMP required DRO and GRO samples collected from MW18S; however, MW18S was dry. Table 5-6 tabulates the results for DRO and GRO ground-water samples. GRO compounds were detected in ground-water samples collected from monitoring wells MW18D and MW20, with a concentration of 0.012 mg/L and 0.015 mg/L, respectively. DRO compounds were detected in ground-water samples collected from

monitoring wells MW18D, MW20, MW22S, and MW22D, with a concentration of 58 µg/L, 61 µg/L, 70 µg/L, and 58 µg/L, respectively. DRO and GRO ground-water regulatory health standards do not exist. Isoconcentration contour maps were not constructed for DRO/GRO compounds; however, Figure 5-3 shows the results.

#### 5.1.7 *Total and Dissolved Metals*

Because metals are naturally occurring, it is difficult to determine if results represent natural conditions or anthropogenic impacts; therefore, Table 5-7 presents only results for total metals exceeding regulatory standards. Appendix A3 presents the remaining results with detectable concentrations below a regulatory standard. In the future, metals results will be compared to a background value after completion of a background study.

#### 5.1.8 *Mercury*

Table 5-7 tabulates the results for mercury. One ground-water sample, from monitoring well TMW27, contained a detectable concentration of mercury in the dissolved phase. The most stringent regulatory health standard for mercury in ground water is the MCL standard of 2.0 µg/L. The result was 0.144 µg/L and below the MCL. No other ground-water sample contained a detectable concentration of either dissolved or total mercury.

#### 5.1.9 *Dioxins and Furans*

Table 5-8 tabulates the results for dioxins and furans. Regulatory health standards do not exist for the dioxins and furans compounds detected in monitoring wells located in the Northern Area.

### 5.2 **OB/OD AREA SAMPLING RESULTS**

OB/OD Area monitoring wells have prefixes KMW and CMW. Ground-water samples collected from these monitoring wells were analyzed for constituents/constituent groups presented in Table 2-1. Tables 5-1 through Table 5-8 present the ground-water sample results. Tables 5-9 through 5-15 compare the ground-water sample results from OB/OD Area monitoring wells collected in April 2008, October 2008, and April 2009 to current results. No isoconcentration contour maps could be developed for the OB/OD Area; however, Figure 5-4 contains the results for all detections, except total metals.

#### 5.2.1 *Nitrate and Nitrite*

Table 5-1 tabulates ground-water sample results for nitrate and nitrite. Nitrate was detected above the MCL (10.0 µg/L) in one ground-water sample collected from monitoring well KMW10, with a concentration of 10.6 µg/L. Nitrite was not detected above the MCL in any ground water sample.

#### 5.2.2 *Total Explosives*

Table 5-2 tabulates the ground-water sample results for total explosives. RDX was detected above the RSL (0.61 µg/L) in ground-water samples collected from monitoring wells CMW17 and CMW18, which measured concentrations of 1.4 µg/L and 47 µg/L, respectively. Other explosive compounds were detected in ground-water samples but at concentrations below any applicable regulatory health standard. Table 5-2 presents

all explosive compound results below and above regulatory health standards.

#### 5.2.3 *Perchlorate*

Table 5-3 tabulates the results for perchlorate. No results exceeded the Permit standard of 6 µg/L.

#### 5.2.4 *Volatile Organic Compounds*

Table 5-4 tabulates the results for VOCs. No results exceeded applicable regulatory health standards.

#### 5.2.5 *Semi-Volatile Organic Compounds*

Table 5-5 tabulates the results for SVOCs. No results exceeded applicable regulatory health standards.

#### 5.2.6 *Total and Dissolved Metals*

Table 5-7 tabulates metals results that exceed a regulatory health standard. Appendix A3 presents metals detected but at concentrations below a regulatory health standard.

#### 5.2.7 *Dioxins and Furans*

Table 5-8 tabulates the results for dioxins and furans. Regulatory health standards do not exist for the dioxins and furans compounds detected in monitoring wells located in the OB/OD Area.

### 5.3 **QUALITY ASSURANCE AND QUALITY CONTROL**

All primary and quality control (QC) blind duplicate samples were sent to ARS Analytical Laboratories in Albuquerque, New Mexico, for analysis. Quality Assurance (QA) triplicate samples were shipped to Agriculture & Priority Pollutants Laboratories (APPL) in Clovis, California. ARS Analytical Laboratories picked up the primary and QC samples the evening of the day of collection, and QA samples were shipped overnight to APPL in Clovis, California, via Federal Express on the day of collection.

QA and QC ground-water samples were collected from 10% of the total samples collected for the on-site and off-site groundwater sampling programs. Only on-site QA/QC samples are referenced in this document. QC samples were submitted to the primary laboratory (ARS) as blind duplicates with fictitious monitoring well identifications. The blind duplicate ground-water samples were collected from five monitoring wells. These samples were collected from TMW14A, MW22D, CMW18, KMW11, and TMW15. QA triplicate ground-water samples were collected from the same monitoring wells as the QC blind duplicate samples and sent to APPL Laboratory. The field-sample identification for QA triplicate samples was the same as the primary sample identification. Appendix A contains additional information on the QA/QC program.

#### **5.4 FIELD VARIANCES FROM WORK PLAN**

USACE did not collect samples from monitoring wells TMW05, MW18S, and KMW13 due to the lack of water. Only perchlorate and nitrate samples were collected from FW10 due to the lack of water. No samples could be collected from CMW06, CMW16, and CMW21 because the wells have been buried and are no longer accessible. CMW20 has been damaged and can no longer be used to collect ground-water samples. USACE did not collect nitrate samples from monitoring wells CMW23 and TMW28 because nitrate was removed from the sampling plan, as illustrated in Table 2-1. However, nitrate has been detected in previous sampling events; Table 5-9 shows the results. USACE will reinstitute collection of these samples in the October 2010 sampling plan. This situation occurred for VOCs at monitoring well FW31 and for SVOCs at monitoring wells MW02, MW18D, and TMW23. USACE will reinstitute analyses of VOCs and SVOCs at these monitoring wells beginning in October 2010.

#### **5.5 PURGE AND DECONTAMINATION WATER AND WASTE DISPOSAL**

USACE placed wastewater, or IDW, in an evaporation tank. During monitoring well purging, water discharged from each monitoring well was temporarily placed in five-gallon buckets. At the end of each day, purge water was transported to the evaporation tank in five-gallon buckets and poured into the evaporation tank. All decontamination fluid was poured into the evaporation tank. All solid waste such as used, non-decontaminated disposable sampling equipment and Personal Protective Equipment (PPE), general refuse, and decontaminated sampling equipment/PPE, was placed in FWDA refuse containers.

**Table 5-1: October 2009 Nitrate and Nitrite Detected**

ANALYTICAL METHOD 300.0 RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW02	Nitrate	14797-55-8	0.5	0.0168	1.75	mg/L				10	MCL	No
CMW10	Nitrate	14797-55-8	0.5	0.0168	5.37	mg/L				10	MCL	No
CMW14	Nitrate	14797-55-8	0.5	0.0168	0.32	mg/L	J	J	J	10	MCL	No
CMW18	Nitrate	14797-55-8	0.5	0.0168	4.85	mg/L				10	MCL	No
CMW24	Nitrate	14797-55-8	0.5	0.0168	0.03	mg/L	J	J	J	10	MCL	No
EMW03	Nitrate	14797-55-8	0.5	0.0168	0.34	mg/L	J	J	J	10	MCL	No
EMW04	Nitrate	14797-55-8	0.5	0.0168	1.2	mg/L				10	MCL	No
FW10	Nitrate	14797-55-8	0.5	0.0168	3	mg/L				10	MCL	No
FW31	Nitrate	14797-55-8	0.5	0.0168	0.38	mg/L	J	J	J	10	MCL	No
FW35	Nitrate	14797-55-8	0.5	0.0168	1.77	mg/L				10	MCL	No
KMW09	Nitrate	14797-55-8	0.5	0.0168	0.03	mg/L	J	J	J	10	MCL	No
<b>KMW10</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>10.6</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
KMW11	Nitrate	14797-55-8	0.5	0.0168	0.24	mg/L	J	J	J	10	MCL	No
KMW12	Nitrate	14797-55-8	0.5	0.0168	0.98	mg/L				10	MCL	No
MW01	Nitrate	14797-55-8	0.5	0.0168	8.17	mg/L				10	MCL	No
MW02	Nitrate	14797-55-8	0.5	0.0168	0.55	mg/L				10	MCL	No
<b>MW03</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>14.3</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
MW18D	Nitrate	14797-55-8	0.5	0.0168	0.23	mg/L	J	J	J	10	MCL	No
<b>MW20</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>29.8</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
<b>MW22D</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>18.1</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
<b>MW22S</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>31.9</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
TMW01	Nitrate	14797-55-8	0.5	0.0168	9.05	mg/L				10	MCL	No
<b>TMW02</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>5</b>	<b>0.168</b>	<b>105</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
<b>TMW03</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>5</b>	<b>0.168</b>	<b>165</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
<b>TMW04</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>50.6</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
<b>TMW06</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>26</b>	<b>mg/L</b>		J	J	<b>10</b>	<b>MCL</b>	<b>Yes</b>
TMW07	Nitrate	14797-55-8	0.5	0.0168	0.18	mg/L	J+	J	J	10	MCL	No
TMW08	Nitrate	14797-55-8	0.5	0.0168	0.42	mg/L	J	J	J	10	MCL	No
TMW10	Nitrate	14797-55-8	0.5	0.0168	0.08	mg/L	J	J	J	10	MCL	No
TMW11	Nitrate	14797-55-8	0.5	0.0168	0.25	mg/L	J+	J	J	10	MCL	No
TMW13	Nitrate	14797-55-8	0.5	0.0168	2.2	mg/L				10	MCL	No
TMW14A	Nitrate	14797-55-8	0.5	0.0168	0.05	mg/L	J	J	J	10	MCL	No
TMW15	Nitrate	14797-55-8	0.5	0.0168	1	mg/L				10	MCL	No

**Table 5-1: October 2009 Nitrate and Nitrite Detected**

ANALYTICAL METHOD 300.0 RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
TMW17	Nitrate	14797-55-8	0.5	0.0168	0.04	mg/L	J	J	J	10	MCL	No
TMW21	Nitrate	14797-55-8	0.5	0.0168	9.11	mg/L				10	MCL	No
TMW22	Nitrate	14797-55-8	0.5	0.0168	7.46	mg/L				10	MCL	No
<b>TMW23</b>	<b>Nitrate</b>	<b>14797-55-8</b>	<b>0.5</b>	<b>0.0168</b>	<b>39</b>	<b>mg/L</b>				<b>10</b>	<b>MCL</b>	<b>Yes</b>
TMW25	Nitrate	14797-55-8	0.5	0.0168	0.89	mg/L				10	MCL	No
TMW26	Nitrate	14797-55-8	0.5	0.0168	0.05	mg/L	J+	J	J	10	MCL	No
TMW29	Nitrate	14797-55-8	0.5	0.0168	4.68	mg/L				10	MCL	No
CMW02	Nitrite	14797-65-0	0.5	0.0153	0.03	mg/L	J	J	J	1	MCL	No
CMW10	Nitrite	14797-65-0	0.5	0.0153	0.45	mg/L	J	J	J	1	MCL	No
CMW14	Nitrite	14797-65-0	0.5	0.0153	0.27	mg/L	J	J	J	1	MCL	No
CMW17	Nitrite	14797-65-0	0.5	0.0153	0.04	mg/L	J	J	J	1	MCL	No
CMW18	Nitrite	14797-65-0	0.5	0.0153	0.06	mg/L	J	J	J	1	MCL	No
EMW03	Nitrite	14797-65-0	0.5	0.0153	0.07	mg/L	J+	J	J	1	MCL	No
<b>EMW04</b>	<b>Nitrite</b>	<b>14797-65-0</b>	<b>0.5</b>	<b>0.0153</b>	<b>1.49</b>	<b>mg/L</b>				<b>1</b>	<b>MCL</b>	<b>Yes</b>
FW31	Nitrite	14797-65-0	0.5	0.0153	0.04	mg/L	J	J	J	1	MCL	No
KMW11	Nitrite	14797-65-0	0.5	0.0153	0.03	mg/L	J	J	J	1	MCL	No
KMW12	Nitrite	14797-65-0	0.5	0.0153	0.43	mg/L	J	J	J	1	MCL	No
MW01	Nitrite	14797-65-0	0.5	0.0153	0.04	mg/L	J	J	J	1	MCL	No
MW03	Nitrite	14797-65-0	0.5	0.0153	0.14	mg/L	J	J	J	1	MCL	No
<b>MW20</b>	<b>Nitrite</b>	<b>14797-65-0</b>	<b>0.5</b>	<b>0.0153</b>	<b>4.38</b>	<b>mg/L</b>				<b>1</b>	<b>MCL</b>	<b>Yes</b>
MW22S	Nitrite	14797-65-0	0.5	0.0153	0.27	mg/L	J	J	J	1	MCL	No
SMW01	Nitrite	14797-65-0	0.5	0.0153	0.02	mg/L	J	J	J	1	MCL	No
TMW01	Nitrite	14797-65-0	0.5	0.0153	0.1	mg/L	J	J	J	1	MCL	No
TMW02	Nitrite	14797-65-0	0.5	0.0153	0.27	mg/L	J	J	J	1	MCL	No
TMW03	Nitrite	14797-65-0	0.5	0.0153	0.66	mg/L				1	MCL	No
TMW04	Nitrite	14797-65-0	0.5	0.0153	0.2	mg/L	J	J	J	1	MCL	No
TMW06	Nitrite	14797-65-0	0.5	0.0153	0.15	mg/L	J+	J	J	1	MCL	No
<b>TMW08</b>	<b>Nitrite</b>	<b>14797-65-0</b>	<b>0.5</b>	<b>0.0153</b>	<b>1.59</b>	<b>mg/L</b>		<b>J</b>	<b>J</b>	<b>1</b>	<b>MCL</b>	<b>Yes</b>
TMW11	Nitrite	14797-65-0	0.5	0.0153	0.03	mg/L	J	J	J	1	MCL	No
TMW18	Nitrite	14797-65-0	0.5	0.0153	0.05	mg/L	J	J	J	1	MCL	No
TMW21	Nitrite	14797-65-0	0.5	0.0153	0.06	mg/L	J	J	J	1	MCL	No
TMW22	Nitrite	14797-65-0	0.5	0.0153	0.24	mg/L	J	J	J	1	MCL	No

**Table 5-1: October 2009 Nitrate and Nitrite Detected**

ANALYTICAL METHOD 300.0 RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
TMW23	Nitrite	14797-65-0	0.5	0.0153	0.1	mg/L	J	J	J	1	MCL	No
TMW29	Nitrite	14797-65-0	0.5	0.0153	0.11	mg/L	J	J	J	1	MCL	No

*J: Is an estimate, but detected*

*Lab Flag: Qualifier assigned by lab*

*V Flag: Qualifier during data validation*

*Final Flag: Final Qualifier*

*MCL: U.S. EPA Maximum Contaminant Level*

*mg/L: Milligrams per Liter*

*RL: Reporting Limit*

*DL: Detection Limit*

*Value Used: The applicable regulatory standard value*

*Bolded Values: Standard Exceeded*

Table 5-2: October 2009 Total Explosives Detected

ANALYTICAL METHOD 8330 RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
<b>CMW17</b>	<b>RDX</b>	<b>121-82-4</b>	<b>0.25</b>	<b>0.14</b>	<b>1.4</b>	<b>ug/L</b>				<b>0.61</b>	<b>CA</b>	<b>Yes</b>
CMW18	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	1	0.13	1.7	ug/L				73	NC	No
CMW18	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	0.44	0.1	1.8	ug/L				73	NC	No
CMW18	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	1	0.1	1.8	ug/L				73	NC	No
CMW18	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	0.44	0.23	2.3	ug/L				73	NC	No
<b>CMW18</b>	<b>RDX</b>	<b>121-82-4</b>	<b>20</b>	<b>2.4</b>	<b>47</b>	<b>ug/L</b>				<b>0.61</b>	<b>CA</b>	<b>Yes</b>
<b>CMW18</b>	<b>RDX</b>	<b>121-82-4</b>	<b>2.2</b>	<b>1.2</b>	<b>47</b>	<b>ug/L</b>				<b>0.61</b>	<b>CA</b>	<b>Yes</b>
CMW18	HMX	2691-41-0	1	0.12	15	ug/L				1800	NC	No
<b>TMW03</b>	<b>Dinitrotoluene, 2,4-</b>	<b>121-14-2</b>	<b>0.47</b>	<b>0.19</b>	<b>0.33</b>	<b>ug/L</b>	<b>J</b>	<b>J</b>	<b>J</b>	<b>0.22</b>	<b>NC</b>	<b>Yes</b>
TMW03	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	0.47	0.11	1.5	ug/L				73	NC	No
TMW03	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	0.47	0.24	1.3	ug/L				73	NC	No
<b>TMW03</b>	<b>RDX</b>	<b>121-82-4</b>	<b>47</b>	<b>26</b>	<b>370</b>	<b>ug/L</b>				<b>0.61</b>	<b>CA</b>	<b>Yes</b>
<b>TMW03</b>	<b>Nitrobenzene</b>	<b>98-95-3</b>	<b>0.47</b>	<b>0.21</b>	<b>4.1</b>	<b>ug/L</b>				<b>3.4</b>	<b>NC</b>	<b>Yes</b>
TMW03	Trinitrobenzene, 1,3,5-	99-35-4	0.47	0.19	2	ug/L				1100	NC	No
TMW04	Dinitrotoluene, 2,4-	121-14-2	0.25	0.1	0.18	ug/L	J	J	J	0.22	NC	No
TMW04	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	0.25	0.06	2.8	ug/L				73	NC	No
TMW04	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	0.25	0.13	2.4	ug/L				73	NC	No
<b>TMW04</b>	<b>RDX</b>	<b>121-82-4</b>	<b>0.25</b>	<b>0.14</b>	<b>2.3</b>	<b>ug/L</b>				<b>0.61</b>	<b>CA</b>	<b>Yes</b>
<b>TMW04</b>	<b>Nitrobenzene</b>	<b>98-95-3</b>	<b>0.25</b>	<b>0.11</b>	<b>5.4</b>	<b>ug/L</b>				<b>3.4</b>	<b>NC</b>	<b>Yes</b>
TMW04	Trinitrobenzene, 1,3,5-	99-35-4	0.25	0.1	5.2	ug/L				1100	NC	No
TMW11	RDX	121-82-4	0.5	0.28	0.43	ug/L	J	J	J	0.61	CA	No
<b>TMW23</b>	<b>RDX</b>	<b>121-82-4</b>	<b>0.4</b>	<b>0.23</b>	<b>12</b>	<b>ug/L</b>		<b>J</b>	<b>J</b>	<b>0.61</b>	<b>CA</b>	<b>Yes</b>

RDX: Hexahydro-1,3,5-Trinitro-1,3,5-Triazine

HMX: Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra

J Flag: Is an estimate, but detected

Lab Flag: Qualifier assigned by lab

V Flag: Qualifier during data validation

Final Flag: Final Qualifier

CA: US EPA Regional Screening Levels non carcinogenic (December 2009)

NC: US EPA Regional Screening Levels for non-carcinogenic (December 2009)

ug/L: Micrograms per Liter

RL: Reporting Limit

DL: Detection Limit

Value Used: The applicable regulatory standard value

Bolded Values: Standard exceeded



**Table 5-3: October 2009 Perchlorate Detected**

ANALYTICAL METHOD 6850												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW02	Perchlorate	14797-73-0	0.2	0.062	0.59	ug/L				6	Permit	No
CMW10	Perchlorate	14797-73-0	0.2	0.062	0.66	ug/L				6	Permit	No
CMW18	Perchlorate	14797-73-0	0.2	0.062	4.8	ug/L				6	Permit	No
EMW01	Perchlorate	14797-73-0	2	0.62	3.5	ug/L				6	Permit	No
KMW10	Perchlorate	14797-73-0	0.2	0.062	3	ug/L				6	Permit	No
KWM11	Perchlorate	14797-73-0	0.2	0.062	0.52	ug/L				6	Permit	No
MW20	Perchlorate	14797-73-0	0.2	0.062	0.44	ug/L				6	Permit	No
<b>TMW01</b>	<b>Perchlorate</b>	<b>14797-73-0</b>	<b>2</b>	<b>0.62</b>	<b>260</b>	<b>ug/L</b>				<b>6</b>	<b>Permit</b>	<b>Yes</b>
TMW02	Perchlorate	14797-73-0	0.2	0.062	1.9	ug/L				6	Permit	No
TMW03	Perchlorate	14797-73-0	0.2	0.062	1	ug/L				6	Permit	No
TMW04	Perchlorate	14797-73-0	0.2	0.062	0.85	ug/L				6	Permit	No
TMW11	Perchlorate	14797-73-0	0.2	0.062	0.12	ug/L	J	J	J	6	Permit	No

*J: Is an estimate, but detected*

*Lab Flag: Qualifier assigned by lab*

*V Flag: Qualifier during data validation*

*Final Flag: Final Qualifier*

*MCL: U.S. EPA Maximum Contaminant Level*

*ug/L: Micrograms per Liter*

*RL: Reporting Limit*

*DL: Detection Limit*

*Value Used: The applicable regulatory standard value*

*Bolded Values: Standard Exceeded*

Table 5-4: October 2009 Volatile Organic Compounds Detected

ANALYTICAL METHOD 8260D RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW04	Carbon Disulfide	75-15-0	0.5	0.1	2.8	ug/L				1000	NC	No
CMW04	Chloromethane	74-87-3	0.5	0.1	0.1	ug/L	J	J	J	190	CA	No
CMW10	Chloromethane	74-87-3	0.5	0.1	0.2	ug/L	J	J	J	190	CA	No
CMW14	Acetone	67-64-1	5	3.3	20	ug/L				22000	NC	No
CMW14	Benzene	71-43-2	0.5	0.2	1.3	ug/L				5	MCL	No
CMW14	Chloromethane	108-90-7	0.5	0.1	0.1	ug/L	J	J	J	100	MCL	No
CMW14	Chloromethane	74-87-3	0.5	0.1	1.8	ug/L				190	CA	No
CMW14	Methyl Ethyl Ketone (2-Butanone)	78-93-3	5	0.9	1.9	ug/L	J	J	J	7100	NC	No
CMW17	Acetone	67-64-1	10	3.3	14	ug/L		J	J	22000	NC	No
CMW17	Carbon Disulfide	75-15-0	5	0.1	4.5	ug/L	J	J	J	1000	NC	No
CMW17	Methyl acetate	79-20-9	0.5	0.2	0.88	ug/L		J	J	37000	NC	No
CMW17	Methyl Ethyl Ketone (2-Butanone)	78-93-3	5	0.9	1.1	ug/L	J	J	J	7100	NC	No
CMW19	Carbon Disulfide	75-15-0	5	0.1	4	ug/L	J	J	J	1000	NC	No
CMW19	Chloromethane	74-87-3	5	0.1	0.5	ug/L	J	J	J	190	CA	No
CMW19	Methylene Chloride	75-09-2	10	0.1	0.2	ug/L	J	J	J	5	MCL	No
CMW24	Carbon Disulfide	75-15-0	0.5	0.1	18	ug/L				1000	NC	No
CMW25	Carbon Disulfide	75-15-0	0.5	0.1	2.3	ug/L				1000	NC	No
CMW25	Methylene Chloride	75-09-2	0.5	0.1	0.1	ug/L	J	J	J	5	MCL	No
EMW01	Acetone	67-64-1	5	3.3	6.1	ug/L				22000	NC	No
EMW01	Chloromethane	74-87-3	0.5	0.1	0.2	ug/L	J	J	J	190	CA	No
EMW03	Methylene Chloride	75-09-2	0.5	0.1	0.2	ug/L	J	J	J	5	MCL	No
EMW04	Methylene Chloride	75-09-2	10	0.1	0.1	ug/L	J	J	J	5	MCL	No
EMW04	Toluene	108-88-3	1	0.3	35	ug/L				750	WQCC	No
KMW10	Tetrachloroethylene	127-18-4	0.5	0.1	0.3	ug/L	J	J	J	5	MCL	No
KMW11	Tetrachloroethylene	127-18-4	0.5	0.1	1.8	ug/L				5	MCL	No
KMW12	Toluene	108-88-3	0.5	0.2	18	ug/L				750	WQCC	No
MW01	Dichloroethane, 1,2-	107-06-2	0.5	0.2	1.2	ug/L		J	J	5	MCL	No
MW02	Dichloroethane, 1,2-	107-06-2	0.5	0.2	0.7	ug/L				5	MCL	No
MW02	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	0.2	0.4	ug/L	J	J	J	12	CA	No
MW18D	Carbon Disulfide	75-15-0	0.5	0.1	1.2	ug/L				1000	NC	No
<b>MW18D</b>	<b>Dichloroethane, 1,2-</b>	<b>107-06-2</b>	<b>0.5</b>	<b>0.2</b>	<b>120</b>	<b>ug/L</b>				<b>5</b>	<b>MCL</b>	<b>Yes</b>
MW20	Bromomethane	74-83-9	0.5	0.1	1.2	ug/L		J	J	8.7	NC	No

Table 5-4

Table 5-4: October 2009 Volatile Organic Compounds Detected

ANALYTICAL METHOD 8260D RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
MW20	Chloromethane	74-87-3	0.5	0.1	0.4	ug/L	J	J	J	190	CA	No
MW20	Dichloroethane, 1,1-	75-34-3	0.5	0.1	0.2	ug/L	J	J	J	25	WQCC	No
<b>MW20</b>	<b>Dichloroethane, 1,2-</b>	<b>107-06-2</b>	<b>0.5</b>	<b>0.2</b>	<b>10</b>	<b>ug/L</b>		<b>J</b>	<b>J</b>	<b>5</b>	<b>MCL</b>	<b>Yes</b>
MW20	Toluene	108-88-3	0.5	0.2	0.2	ug/L	J	J	J	750	WQCC	No
MW22D	Dichloroethane, 1,2-	107-06-2	0.5	0.14	0.32	ug/L	J	J	J	5	MCL	No
MW22S	Dichloroethane, 1,1-	75-34-3	0.5	0.1	0.6	ug/L				25	WQCC	No
MW22S	Dichloroethane, 1,2-	107-06-2	0.5	0.2	0.7	ug/L				5	MCL	No
MW22S	Trichloroethane, 1,1,1-	71-55-6	0.5	0.2	3.4	ug/L				60	WQCC	No
TMW13	Methylene Chloride	75-09-2	0.5	0.1	0.1	ug/L	J	J	J	5	MCL	No
TMW14A	Carbon Disulfide	75-15-0	5	0.2	2	ug/L	J	J	J	1000	NC	No
TMW14A	Methylene Chloride	75-09-2	10	0.1	0.1	ug/L	J	J	J	5	MCL	No
TMW16	Methyl Isobutyl Ketone	108-10-1	5	0.3	0.4	ug/L	J	J	J	2000	NC	No
TMW16	Toluene	108-88-3	2.5	0.8	200	ug/L				750	WQCC	No
TMW17	Carbon Disulfide	75-15-0	0.5	0.1	18	ug/L		J	J	1000	NC	No
TMW17	Chloromethane	74-87-3	0.5	0.1	4.6	ug/L		J	J	190	CA	No
TMW18	Chloromethane	74-87-3	0.5	0.1	0.1	ug/L	J	J	J	190	CA	No
TMW18	Ethylbenzene	100-41-4	0.5	0.2	0.2	ug/L	J	J	J	700	MCL	No
TMW18	Methyl Isobutyl Ketone	108-10-1	5	0.3	0.3	ug/L	J	J	J	2000	NC	No
<b>TMW18</b>	<b>Toluene</b>	<b>108-88-3</b>	<b>5</b>	<b>1.6</b>	<b>1100</b>	<b>ug/L</b>				<b>750</b>	<b>WQCC</b>	<b>Yes</b>
TMW19	Ethylbenzene	100-41-4	0.5	0.2	0.2	ug/L	J	J	J	700	MCL	No
TMW19	Methyl Isobutyl Ketone	108-10-1	5	0.3	0.4	ug/L	J	J	J	2000	NC	No
TMW19	Toluene	108-88-3	5	1.6	590	ug/L				750	WQCC	No
TMW21	Methylene Chloride	75-09-2	0.5	0.1	0.1	ug/L	J	J	J	5	MCL	No
TMW27	Methylene Chloride	75-09-2	0.5	0.1	0.1	ug/L	J	J	J	5	MCL	No

J Flag: Is an estimate, but detected

Lab Flag: Qualifier assigned by lab

V Flag: Qualifier during data validation

Final Flag: Final Qualifier

CA: US EPA Regional Screening Levels non carcinogenic (December 2009)

NC: US EPA Regional Screening Levels for non-carcinogenic (December 2009)

MCL: U.S. EPA Maximum Contaminant Level

WQCC: New Mexico Water Quality Control Standard

ug/L: Micrograms per Liter

RL: Reporting Limit

DL: Detection Limit

Value Used: The applicable regulatory standard value

Bolded Values: Standard exceeded

**Table 5-5: October 2009 Semi-Volatile Compounds Detected**

ANALYTICAL METHOD 8270C RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW14	Acetophenone	98-86-2	5.3	1.6	2.2	ug/L	J	J	J	3700	NC	No
CMW14	Caprolactam	105-60-2	5.3	0.66	4.2	ug/L	J	J	J	18000	NC	No
CMW24	Nitrosodiphenylamine, N-	86-30-6	5.2	0.72	0.72	ug/L	J	J	J	14	CA	No
EMW01	Caprolactam	105-60-2	5	0.64	0.64	ug/L	J	J	J	18000	NC	No
FW35	Bis(2-ethylhexyl)phthalate	117-81-7	5.2	1.2	2	ug/L	J	J	J	6	MCL	No
FW35	Dibutyl Phthalate	84-74-2	5.2	0.25	0.28	ug/L	J	J	J	3700	NC	No
MW22S	Dibutyl Phthalate	84-74-2	5	0.24	0.32	ug/L	J	J	J	3700	NC	No
TMW03	Dinitrophenol, 2,4-	51-28-5	11	1.9	46	ug/L				73	NC	No
TMW07	Bis(2-ethylhexyl)phthalate	117-81-7	5	1.2	3.2	ug/L	J	J	J	6	MCL	No
TMW07	Chrysene	218-01-9	5	0.47	0.8	ug/L	J	J	J	2.9	CA	No
TMW07	Dibutyl Phthalate	84-74-2	5	0.24	0.75	ug/L	J	J	J	3700	NC	No
TMW07	Flouranthene	206-44-0	5	0.4	0.41	ug/L	J	J	J	1500	NC	No
TMW16	Acetophenone	98-86-2	5.3	1.6	2	ug/L	J	J	J	3700	NC	No
TMW16	Cresol, o-	95-48-7	5.3	2	31	ug/L				1800	NC	No
TMW18	Acetophenone	98-86-2	5.4	1.6	49	ug/L				3700	NC	No
TMW18	Bis(2-ethylhexyl)phthalate	117-81-7	5.4	1.3	1.3	ug/L	J	J	J	6	MCL	No
TMW18	Cresol, o-	95-48-7	5.4	2	2.3	ug/L	J	J	J	1800	NC	No
TMW18	Dibutyl Phthalate	84-74-2	5.4	0.26	0.35	ug/L	J	J	J	3700	NC	No
<b>TMW18</b>	<b>Phenol</b>	<b>108-95-2</b>	<b>5.4</b>	<b>1.2</b>	<b>160</b>	<b>ug/L</b>				<b>5</b>	<b>WQCC</b>	<b>Yes</b>
TMW19	Acetophenone	98-86-2	5.2	1.6	19	ug/L		J	J	3700	NC	No
TMW19	Cresol, o-	95-48-7	5.2	1.9	3.1	ug/L	J	J	J	1800	NC	No
TMW19	Dibutyl Phthalate	84-74-2	5.2	0.25	0.52	ug/L	J	J	J	3700	NC	No
<b>TMW19</b>	<b>Phenol</b>	<b>108-95-2</b>	<b>5.2</b>	<b>1.2</b>	<b>180</b>	<b>ug/L</b>				<b>5</b>	<b>WQCC</b>	<b>Yes</b>

J Flag: Is an estimate, but detected

Lab Flag: Qualifier assigned by lab

V Flag: Qualifier during data validation

Final Flag: Final Qualifier

CA: US EPA Regional Screening Levels non carcinogenic (December 2009)

NC: US EPA Regional Screening Levels for non-carcinogenic (December 2009)

MCL: U.S. EPA Maximum Contaminant Level

WQCC: New Mexico Water Quality Control Standard

ug/L: Micrograms per Liter

RL: Reporting Limit

DL: Detection Limit

Value Used: The applicable regulatory standard value

Bolded Values: Standard exceeded

**Table 5-6: October 2009 Diesel and Gasoline Range Organics Detected**

ANALYTICAL METHOD 8015B RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
<b>GRO</b>												
MW18D	Gasoline Range Organics	GRO	1	0.01	0.012	mg/L	J		J	N/A	NS	N/A
MW20	Gasoline Range Organics	GRO	1	0.01	0.015	mg/L	J		J	N/A	NS	N/A
<b>DRO</b>												
MW18D	Diesel Range Organics	DRO	53	36	58	ug/L				N/A	NS	N/A
MW20	Diesel Range Organics	DRO	50	34	61	ug/L				N/A	NS	N/A
MW22D	Diesel Range Organics	DRO	50	34	70	ug/L				N/A	NS	N/A
MW22S	Diesel Range Organics	DRO	50	34	58	ug/L				N/A	NS	N/A

*J Flag: Is an estimate, but detected*

*Lab Flag: Qualifier assigned by lab*

*V Flag: Qualifier during data validation*

*Final Flag: Final Qualifier*

*ug/L: Micrograms per Liter*

*mg/L: Milligrams per Liter*

*RL: Reporting Limit*

*DL: Detection Limit*

*Value Used: The applicable regulatory standard value*

*NS: No Standard*

*N/A: Not Applicable*

*DRO: Diesel Range Organics*

*GRO: Gasoline Range Organics*

Table 5-7: October 2009 Mercury and Metals Detected (Metals results are above a regulatory standard only)

DISSOLVED METALS - ANALYTICAL METHOD 6010B RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW07	Thallium	7440-28-0	0.005	0.0026	0.00448	mg/L	J	J	J	0.002	MCL	Yes
CMW14	Chromium	7440-47-3	0.02	0.005	0.589	mg/L				0.1	MCL	Yes
CMW19	Thallium	7440-28-0	0.005	0.0026	0.00272	mg/L	J	J	J	0.002	MCL	Yes
CMW25	Thallium	7440-28-0	0.005	0.0026	0.00411	mg/L	J	J	J	0.002	MCL	Yes
EMW01	Arsenic	7440-38-2	0.005	0.00443	0.0159	mg/L				0.01	MCL	Yes
EMW01	Thallium	7440-28-0	0.005	0.0026	0.00284	mg/L	J	J	J	0.002	MCL	Yes
EMW02	Manganese	7439-96-5	0.01	0.0034	0.22	mg/L		J	J	0.2	WQCC	Yes
EMW04	Manganese	7439-96-5	0.01	0.0034	0.274	mg/L				0.2	WQCC	Yes
EMW04	Nickel	7440-02-0	0.02	0.0071	0.238	mg/L				0.2	WQCC	Yes
KMW09	Manganese	7439-96-5	0.01	0.0034	0.208	mg/L		J	J	0.2	WQCC	Yes
KMW11	Arsenic	7440-38-2	0.005	0.00443	0.0288	mg/L				0.01	MCL	Yes
KMW12	Manganese	7439-96-5	0.01	0.0034	0.952	mg/L				0.2	WQCC	Yes
MW02	Manganese	7439-96-5	0.01	0.0034	0.52	mg/L				0.2	WQCC	Yes
MW18D	Manganese	7439-96-5	0.01	0.0034	0.744	mg/L				0.2	WQCC	Yes
MW20	Manganese	7439-96-5	0.1	0.034	2.67	mg/L				0.2	WQCC	Yes
MW20	Selenium	7782-49-2	0.1	0.0561	0.275	mg/L				0.05	MCL	Yes
MW22D	Selenium	7782-49-2	0.01	0.00561	0.0501	mg/L				0.05	MCL	Yes
MW22S	Selenium	7782-49-2	0.01	0.00561	0.057	mg/L				0.05	MCL	Yes
TMW01	Arsenic	7440-38-2	0.005	0.00443	0.0116	mg/L				0.01	MCL	Yes
TMW02	Selenium	7782-49-2	0.01	0.00561	0.0908	mg/L				0.05	MCL	Yes
TMW03	Selenium	7782-49-2	0.01	0.00561	0.0731	mg/L				0.05	MCL	Yes
TMW03	Thallium	7440-28-0	0.005	0.0026	0.00335	mg/L	J	J	J	0.002	MCL	Yes
TMW04	Selenium	7782-49-2	0.01	0.00561	0.1	mg/L				0.05	MCL	Yes
TMW07	Manganese	7439-96-5	0.001	0.00034	0.249	mg/L				0.2	WQCC	Yes
TMW07	Manganese	7439-96-5	0.01	0.0034	0.254	mg/L				0.2	WQCC	Yes
TMW08	Manganese	7439-96-5	0.01	0.0034	0.384	mg/L		J	J	0.2	WQCC	Yes
TMW13	Thallium	7440-28-0	0.005	0.0026	0.00267	mg/L	J	J	J	0.002	MCL	Yes
TMW14A	Thallium	7440-28-0	0.005	0.0026	0.00316	mg/L	J	J	J	0.002	MCL	Yes
TMW27	Arsenic	7440-38-2	0.005	0.00443	0.0193	mg/L				0.01	MCL	Yes
TMW27	Manganese	7439-96-5	0.01	0.0034	0.536	mg/L				0.2	WQCC	Yes
TMW28	Manganese	7439-96-5	0.01	0.0034	0.219	mg/L		J	J	0.2	WQCC	Yes
DISSOLVED MERCURY - ANALYTICAL METHOD 7470A RESULTS												
TMW27	Mercury (elemental)	7439-97-6	0.2	0.05	0.144	ug/L	J	J	J	2	MCL	No

Table 5-7

Table 5-7: October 2009 Mercury and Metals Detected (Metals results are above a regulatory standard only)

TOTAL METALS - ANALYTICAL METHOD 6010B RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW04	Manganese	7439-96-5	0.001	0.00034	0.202	mg/L				0.2	WQCC	Yes
CMW04	Thallium	7440-28-0	0.005	0.0026	0.00456	mg/L	J	J	J	0.002	MCL	Yes
CMW14	Chromium	7440-47-3	0.02	0.005	0.635	mg/L				0.1	MCL	Yes
CMW23	Manganese	7439-96-5	0.01	0.0034	0.262	mg/L				0.2	WQCC	Yes
CMW24	Manganese	7439-96-5	0.01	0.0034	0.239	mg/L				0.2	WQCC	Yes
CMW25	Antimony and compounds	7440-36-0	0.006	0.00337	0.00682	mg/L				0.006	MCL	Yes
EMW01	Thallium	7440-28-0	0.005	0.0026	0.00467	mg/L	J	J	J	0.002	MCL	Yes
EMW02	Manganese	7439-96-5	0.01	0.0034	0.221	mg/L				0.2	WQCC	Yes
EMW04	Manganese	7439-96-5	0.01	0.0034	0.312	mg/L				0.2	WQCC	Yes
EMW04	Nickel	7440-02-0	0.02	0.0071	0.304	mg/L				0.2	WQCC	Yes
FW31	Arsenic	7440-38-2	0.005	0.00443	0.0114	mg/L				0.01	MCL	Yes
FW35	Manganese	7439-96-5	0.01	0.0034	0.263	mg/L				0.2	WQCC	Yes
KMW09	Manganese	7439-96-5	0.01	0.0034	0.226	mg/L				0.2	WQCC	Yes
KMW11	Arsenic	7440-38-2	0.005	0.00443	0.0295	mg/L				0.01	MCL	Yes
KMW12	Manganese	7439-96-5	0.01	0.0034	1	mg/L				0.2	WQCC	Yes
MW02	Manganese	7439-96-5	0.01	0.0034	0.907	mg/L				0.2	WQCC	Yes
MW18D	Manganese	7439-96-5	0.01	0.0034	0.769	mg/L				0.2	WQCC	Yes
MW20	Manganese	7439-96-5	0.1	0.034	2.79	mg/L				0.2	WQCC	Yes
MW20	Selenium	7782-49-2	0.1	0.0561	0.227	mg/L				0.05	MCL	Yes
MW22D	Selenium	7782-49-2	0.01	0.00561	0.0509	mg/L				0.05	MCL	Yes
MW22S	Lead	7439-92-1	0.005	0.00183	0.0268	mg/L				0.015	MCL	Yes
MW22S	Manganese	7439-96-5	0.01	0.0034	0.4	mg/L				0.2	WQCC	Yes
MW22S	Selenium	7782-49-2	0.01	0.00561	0.0572	mg/L				0.05	MCL	Yes
TMW01	Arsenic	7440-38-2	0.005	0.00443	0.0106	mg/L				0.01	MCL	Yes
TMW02	Arsenic	7440-38-2	0.005	0.00443	0.012	mg/L				0.01	MCL	Yes
TMW02	Selenium	7782-49-2	0.01	0.00561	0.0922	mg/L				0.05	MCL	Yes
TMW03	Arsenic	7440-38-2	0.005	0.00443	0.0102	mg/L				0.01	MCL	Yes
TMW03	Selenium	7782-49-2	0.01	0.00561	0.083	mg/L				0.05	MCL	Yes
TMW03	Thallium	7440-28-0	0.005	0.0026	0.00331	mg/L	J	J	J	0.002	MCL	Yes
TMW04	Selenium	7782-49-2	0.01	0.00561	0.111	mg/L				0.05	MCL	Yes
TMW07	Manganese	7439-96-5	0.01	0.0034	0.338	mg/L				0.2	WQCC	Yes
TMW08	Manganese	7439-96-5	0.01	0.0034	0.364	mg/L				0.2	WQCC	Yes
TMW10	Thallium	7440-28-0	0.005	0.0026	0.00273	mg/L	J	J	J	0.002	MCL	Yes

**Table 5-7: October 2009 Mercury and Metals Detected (Metals results are above a regulatory standard only)**

TOTAL METALS - ANALYTICAL METHOD 6010B RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
TMW19	Thallium	7440-28-0	0.005	0.0026	0.00373	mg/L	J	J	J	0.002	MCL	Yes
TMW22	Aluminum	7429-90-5	0.5	0.158	66.2	mg/L				37	NC	Yes
TMW22	Iron	7439-89-6	3	0.0965	35	mg/L				26	NC	Yes
TMW22	Lead	7439-92-1	0.005	0.00183	0.0165	mg/L				0.015	MCL	Yes
TMW22	Manganese	7439-96-5	0.01	0.0034	1.43	mg/L				0.2	WQCC	Yes
TMW23	Antimony and compounds	7440-36-0	0.006	0.00337	0.00845	mg/L				0.006	MCL	Yes
TMW23	Manganese	7439-96-5	0.01	0.0034	0.6	mg/L				0.2	WQCC	Yes
TMW24	Antimony and compounds	7440-36-0	0.006	0.00337	0.00908	mg/L				0.006	MCL	Yes
TMW25	Manganese	7439-96-5	0.01	0.0034	0.226	mg/L				0.2	WQCC	Yes
TMW26	Antimony and compounds	7440-36-0	0.006	0.00337	0.0107	mg/L				0.006	MCL	Yes
TMW27	Arsenic	7440-38-2	0.005	0.00443	0.0285	mg/L				0.01	MCL	Yes
TMW27	Manganese	7439-96-5	0.01	0.0034	0.575	mg/L				0.2	WQCC	Yes
TMW28	Manganese	7439-96-5	0.01	0.0034	0.241	mg/L				0.2	WQCC	Yes
TMW29	Aluminum	7429-90-5	0.5	0.158	48.7	mg/L		J	J	37	NC	Yes
TMW29	Manganese	7439-96-5	0.01	0.0034	0.347	mg/L				0.2	WQCC	Yes

J Flag: Is an estimate, but detected

Lab Flag: Qualifier assigned by lab

V Flag: Qualifier during data validation

Final Flag: Final Qualifier

MCL: U.S. EPA Maximum Contaminant Level

WQCC: New Mexico Water Quality Control Standard

ug/L: Microgram per Liter

mg/L: Milligrams per Liter

RL: Reporting Limit

DL: Detection Limit

Value Used: The applicable regulatory standard value

Bolded Values: Standard exceeded



**Table 5-8: October 2009 Dioxins and Furans Detected**

ANALYTICAL METHOD 8290A RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
CMW02	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.24	0.24	0.37	pg/L	JR		J	NA	NS	NA
CMW07	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.2	0.2	0.28	pg/L	JR		J	NA	NS	NA
CMW18	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.4	0.4	0.47	pg/L	JR		J	NA	NS	NA
CMW25	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.21	0.21	0.3	pg/L	JR		J	NA	NS	NA
FW31	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.23	0.23	0.3	pg/L	JR		J	NA	NS	NA
KMW11	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.2	0.2	0.3	pg/L	MJR		J	NA	NS	NA
MW22D	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.46	0.46	0.58	pg/L	JR		J	NA	NS	NA
MW22D	Octachlorodibenzo-p-dioxin	3268-87-9	1.5	1.5	2.13	pg/L	J		J	NA	NS	NA
MW22D	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.24	0.24	0.28	pg/L	JR		J	NA	NS	NA
MW22S	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.94	0.94	1.97	pg/L	MJ		J	NA	NS	NA
MW22S	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.37	0.37	0.438	pg/L	J		J	NA	NS	NA
MW22S	Octachlorodibenzo-p-dioxin	3268-87-9	2	2	22.1	pg/L	M			NA	NS	NA
MW22S	Total Heptachlorodibenzo-p-dioxin	37871-00-4	0.94	0.94	1.97	pg/L				NA	NS	NA
MW22S	Total Pentachlorodibenzofuran	30402-15-4	0.4	0.4	0.991	pg/L				NA	NS	NA
TMW01	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	0.36	0.36	0.379	pg/L	MJ		J	NA	NS	NA
TMW01	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.46	0.46	0.71	pg/L	JR		J	NA	NS	NA
TMW01	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.27	0.27	0.42	pg/L	JR		J	NA	NS	NA
TMW01	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.19	0.19	0.284	pg/L	J		J	NA	NS	NA
TMW01	1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	0.2	0.2	0.21	pg/L	JR		J	NA	NS	NA
TMW01	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	0.2	0.2	0.428	pg/L	J		J	NA	NS	NA
TMW01	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	0.24	0.24	0.3	pg/L	JR		J	NA	NS	NA
TMW01	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	0.27	0.27	0.45	pg/L	JR		J	NA	NS	NA
TMW01	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	0.41	0.41	0.45	pg/L	JR		J	NA	NS	NA
TMW01	2,3,4,7,8-Pentachlorodibenzofuran	36088-22-9	0.36	0.36	0.379	pg/L				NA	NS	NA
TMW02	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.26	0.26	0.49	pg/L	JR		J	NA	NS	NA
TMW02	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.17	0.17	0.2	pg/L	JR		J	NA	NS	NA
TMW02	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	0.33	0.33	0.4	pg/L	JR		J	NA	NS	NA
TMW13	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.16	0.16	0.276	pg/L	MJ		J	NA	NS	NA
TMW13	Total Pentachlorodibenzofuran	30402-15-4	0.18	0.18	0.302	pg/L				NA	NS	NA
TMW14A	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.27	0.27	0.46	pg/L	MJR		J	NA	NS	NA
TMW14A	Hexachlorodibenzo-p-dioxin	34465-46-8	0.053	0.053	0.611	pg/L				NA	NS	NA
TMW15	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.18	0.18	0.29	pg/L	MJR		J	NA	NS	NA
TMW23	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	0.26	0.26	0.48	pg/L	MJR		J	NA	NS	NA
TMW23	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	0.27	0.27	0.543	pg/L	MJ		J	NA	NS	NA
TMW23	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	0.53	0.53	1.94	pg/L	JB		J	NA	NS	NA
TMW23	Octachlorodibenzo-p-dioxin	3268-87-9	1.4	1.4	14.2	pg/L	JB		J	NA	NS	NA

Table 5-8

**Table 5-8: October 2009 Dioxins and Furans Detected**

ANALYTICAL METHOD 8290A RESULTS												
Well ID	Analyte	CASNR	RL	DL	Result	Units	Lab Flag	V Flag	Final Flag	Value Used	Standard Used	Standard Exceeded
TMW23	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.29	0.29	0.35	pg/L	JR		J	NA	NS	NA
TMW23	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	0.18	0.18	0.24	pg/L	JR		J	NA	NS	NA
TMW23	1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	0.17	0.17	0.19	pg/L	JR		J	NA	NS	NA
TMW23	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	0.21	0.21	0.21	pg/L	JR		J	NA	NS	NA
TMW23	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	0.21	0.21	0.31	pg/L	JR		J	NA	NS	NA
TMW23	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	0.32	0.32	0.58	pg/L	JR		J	NA	NS	NA
TMW27	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	0.23	0.23	0.346	pg/L	MJ		J	NA	NS	NA
TMW27	Hexachlorodibenzo-p-dioxin	34465-46-8	0.18	0.18	0.2	pg/L				NA	NS	NA
TMW27	Total Pentachlorodibenzofuran	30402-15-4	0.27	0.27	0.346	pg/L				NA	NS	NA

*J Flag: Is an estimate, but detected*

*Final Flag: Final Qualifier*

*M: Indicates that a peak has been manually integrated*

*R: Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion*

*Lab Flag: Qualifier assigned by lab*

*V Flag: Qualifier during data validation*

*pg/L: Picograms per Liter*

*RL: Reporting Limit*

*DL: Detection Limit*

*Value Used: The applicable regulatory standard value*

*Bolded Values: Standard exceeded*

**Table 5-9: 2008-2009 Nitrate and Nitrite Detected**

ANALYTICAL METHOD 300.0 RESULT (in mg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW02	Nitrate	14797-55-8	0.62		0.82		1.32		1.75	
CMW02	Nitrite	14797-65-0	ND		ND		ND		0.03	J
CMW10	Nitrate	14797-55-8	1.04		ND		1.18		5.37	
CMW10	Nitrite	14797-65-0	ND		ND		0.88		0.45	J
CMW14	Nitrate	14797-55-8	ND		0.17	J	ND		0.32	J
CMW14	Nitrite	14797-65-0	ND		ND		0.23	J	0.27	J
CMW17	Nitrate	14797-55-8	1.23		1.04		0.88		ND	
CMW17	Nitrite	14797-65-0	ND		ND		0.17	J	0.04	J
CMW18	Nitrate	14797-55-8	4.75		6.24		3.79		4.85	
CMW18	Nitrite	14797-65-0	ND		ND		ND		0.06	J
CMW19	Nitrate	14797-55-8	0.08	J	ND		ND		ND	
CMW21	Nitrate	14797-55-8	0.06	J	ND		ND		ND	
CMW22	Nitrate	14797-55-8	ND		0.2	J	ND		ND	
CMW23	Nitrate	14797-55-8	ND		ND		0.03	J	NS	
CMW24	Nitrate	14797-55-8	0.19	J	0.36	J	ND		0.03	J
CMW25	Nitrate	14797-55-8	ND		0.29	J	ND		ND	
EMW03	Nitrate	14797-55-8	ND		ND		ND		0.34	J
EMW03	Nitrite	14797-65-0	ND		ND		ND		0.07	J
EMW04	Nitrate	14797-55-8	ND		ND		0.02	J	1.2	
EMW04	Nitrite	14797-65-0	ND		ND		ND		1.49	
FMW06	Nitrate	14797-55-8	0.38	J	ND		ND		ND	
FW10	Nitrate	14797-55-8	14.5		9.17		ND		3	
FW31	Nitrate	14797-55-8	0.05	J	ND		ND		0.38	J
FW31	Nitrite	14797-65-0	ND		ND		ND		0.04	J
FW35	Nitrate	14797-55-8	0.22	J	1.16		0.89		1.77	
KMW09	Nitrate	14797-55-8	ND		ND		ND		0.03	J
KMW10	Nitrate	14797-55-8	9.22		9.37		8.04		10.6	
KMW11	Nitrate	14797-55-8	0.24	J	0.35	J	0.12	J	0.24	J
KMW11	Nitrite	14797-65-0	0.02	J	ND		0.03	J	0.03	J
KMW12	Nitrate	14797-55-8	ND		ND		ND		0.98	
KMW12	Nitrite	14797-65-0	ND		ND		ND		0.43	J
MW01	Nitrate	14797-55-8	4.99		6.84		6.75		8.17	

Table 5-9

**Table 5-9: 2008-2009 Nitrate and Nitrite Detected**

ANALYTICAL METHOD 300.0 RESULT (in mg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
MW01	Nitrite	14797-65-0	0.98		ND		ND		0.04	J
MW02	Nitrate	14797-55-8	ND		ND		ND		0.55	
MW03	Nitrate	14797-55-8	11.5		11.2		8.25	J	14.3	
MW03	Nitrite	14797-65-0	ND		ND		0.27	J	0.14	J
MW18D	Nitrate	14797-55-8	ND		ND		ND		0.23	J
MW20	Nitrate	14797-55-8	18.9		26.4	J	16.1		29.8	
MW20	Nitrite	14797-65-0	ND		ND		ND		4.38	
MW22D	Nitrate	14797-55-8	16.4		16.3		14.5		18.1	
MW22S	Nitrate	14797-55-8	16.9		18.7		29.9	J	31.9	
MW22S	Nitrite	14797-65-0	ND		ND		ND		0.27	J
SMW01	Nitrate	14797-55-8	0.09	J	0.45	J	ND		ND	
SMW01	Nitrite	14797-65-0	ND		ND		ND		0.02	J
TMW01	Nitrate	14797-55-8	7.07		8.76		6.46		9.05	
TMW01	Nitrite	14797-65-0	ND		ND		ND		0.1	J
TMW02	Nitrate	14797-55-8	98.8		100		93.3		105	
TMW02	Nitrite	14797-65-0	ND		0.05	J	0.42	J	0.27	J
TMW03	Nitrate	14797-55-8	153		145		124		165	
TMW03	Nitrite	14797-65-0	1.75	J	0.57		0.35	J	0.66	
TMW04	Nitrate	14797-55-8	38.8		47.2		40.1		50.6	
TMW04	Nitrite	14797-65-0	ND		ND		0.08	J	0.2	J
TMW05	Nitrate	14797-55-8	16.2		ND		ND		ND	
TMW06	Nitrate	14797-55-8	25.3		26.9		27.5		26	J
TMW06	Nitrite	14797-65-0	ND		ND		0.11	J	0.15	J
TMW07	Nitrate	14797-55-8	ND		ND		0.21	J	0.18	J
TMW08	Nitrate	14797-55-8	5.5		1.45		0.59		0.42	J
TMW08	Nitrite	14797-65-0	ND		0.51		ND		1.59	J
TMW10	Nitrate	14797-55-8	ND		ND		ND		0.08	J
TMW11	Nitrate	14797-55-8	0.41	J	0.57	J	0.16	J	0.25	J
TMW11	Nitrite	14797-65-0	ND		ND		ND		0.03	J
TMW13	Nitrate	14797-55-8	1.71		2.21		1.11		2.2	
TMW14A	Nitrate	14797-55-8	ND		ND		ND		0.05	J
TMW15	Nitrate	14797-55-8	0.37	J	1.15		0.89		1	
TMW17	Nitrate	14797-55-8	ND		0.23	J	ND		0.04	J
TMW18	Nitrate	14797-55-8	0.65	J	0.19	J	ND		ND	

Table 5-9

**Table 5-9: 2008-2009 Nitrate and Nitrite Detected**

ANALYTICAL METHOD 300.0 RESULT (in mg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW18	Nitrite	14797-65-0	ND		ND		ND		0.05	J
TMW21	Nitrate	14797-55-8	6.84		9.44		7.18		9.11	
TMW21	Nitrite	14797-65-0	0.02	J	ND		0.09	J	0.06	J
TMW22	Nitrate	14797-55-8	4.84		4.31		7.47		7.46	
TMW22	Nitrate	14797-55-8	4.84		7.07		7.47		7.46	
TMW22	Nitrite	14797-65-0	ND		ND		0.24	J	0.24	J
TMW23	Nitrate	14797-55-8	33.7		37.2		33.3		39	
TMW23	Nitrite	14797-65-0	1.39		ND		0.11	J	0.1	J
TMW24	Nitrate	14797-55-8	0.13	J	ND		ND		ND	
TMW25	Nitrate	14797-55-8	0.59		1.36		0.65		0.89	
TMW26	Nitrate	14797-55-8	ND		ND		ND		0.05	J
TMW28	Nitrate	14797-55-8	ND		0.1	J	ND		NS	
TMW29	Nitrate	14797-55-8	3.75		4.35		3.13		4.68	
TMW29	Nitrite	14797-65-0	ND		ND		ND		0.11	J

*J: Is an estimate, but detected*

*Flag: Final Qualifier*

*mg/L: Milligrams per Liter*

*NS: Not Sampled*

*ND: None Detection*

**Table 5-10: 2008-2009 Total Explosives Detected**

ANALYTICAL METHOD 8330 RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW14	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	ND		ND		0.5	J	ND	
CMW14	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	ND		ND		0.15	J	ND	
CMW17	Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	121-82-4	ND		ND		0.61		1.4	
CMW17	Nitrobenzene	98-95-3	ND		ND		0.79		ND	
CMW17	Tetryl (Trinitrophenylmethylnitramine)	479-45-8	ND		ND		1.1		ND	
CMW18	Dinitrotoluene, 2,4-	121-14-2	0.58		ND		ND		ND	
CMW18	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	2.1		1.8		1.8		1.7	
CMW18	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	2.1		1.8		1.8		1.8	
CMW18	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	2.7		2.4		2.3		1.8	
CMW18	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	2.7		2.4		2.3		2.3	
CMW18	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	64		62		61		47	
CMW18	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX)	2691-41-0	19		19		17		15	
CMW18	Trinitrotoluene, 2,4,6-	118-96-7	0.42		ND		0.2	J	ND	
CMW20	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	ND		ND		0.4	J	NS	
CMW20	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	ND		ND		0.4	J	NS	
CMW20	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	0.24	J	ND		ND		NS	
CMW20	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX)	2691-41-0	0.63	J	ND		ND		NS	
CMW20	Trinitrotoluene, 2,4,6-	118-96-7	ND		ND		0.26	J	NS	
CMW24	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	ND		0.26	J	ND		ND	
CMW24	Nitrobenzene	98-95-3	ND		0.54	J	ND		ND	
CMW24	Nitrotoluene, m-	99-08-1	ND		0.94	J	ND		ND	
CMW24	Tetryl (Trinitrophenylmethylnitramine)	479-45-8	ND		0.96	J	ND		ND	
EMW03	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	0.21	J	ND		ND		ND	
FW31	Nitrobenzene	98-95-3	ND		ND		0.76		ND	
FW31	Nitrotoluene, m-	99-08-1	ND		ND		1.4		ND	
FW31	Tetryl (Trinitrophenylmethylnitramine)	479-45-8	5.5		ND		1.5		ND	
FW35	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	0.62		0.33	J	ND		ND	
FW35	Nitrobenzene	98-95-3	0.74		0.71	J	0.28		ND	
FW35	Nitrotoluene, m-	99-08-1	0.69		ND		ND		ND	
FW35	Tetryl (Trinitrophenylmethylnitramine)	479-45-8	ND		1.2	J	1.3		ND	
FW35	Trinitrobenzene, 1,3,5-	99-35-4	0.8		ND		ND		ND	
FW35	Trinitrotoluene, 2,4,6-	118-96-7	0.57		ND		ND		ND	

Table 5-10

**Table 5-10: 2008-2009 Total Explosives Detected**

ANALYTICAL METHOD 8330 RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
MW22S	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX)	2691-41-0	0.67	J	ND		ND		ND	
TMW02	Nitrobenzene	98-95-3	ND		0.81		ND		ND	
TMW03	Dinitrobenzene, 1,3-	99-65-0	0.34		0.77		ND		ND	
TMW03	Dinitrotoluene, 2,4-	121-14-2	ND		1.1		ND		0.33	J
TMW03	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	ND		1.1		ND		1.5	
TMW03	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	1.6		1.9		ND		1.3	
TMW03	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	250		260		320		370	
TMW03	Nitrobenzene	98-95-3	ND		4.3		ND		4.1	
TMW03	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX)	2691-41-0	11		2.7		ND		ND	
TMW03	Trinitrobenzene, 1,3,5-	99-35-4	ND		2.2		ND		2	
TMW03	Trinitrotoluene, 2,4,6-	118-96-7	0.4		ND		ND		ND	
TMW04	Dinitrobenzene, 1,3-	99-65-0	0.32	J	ND		ND		ND	
TMW04	Dinitrotoluene, 2,4-	121-14-2	0.52		0.5		ND		0.18	J
TMW04	Dinitrotoluene, 2,6-	606-20-2	0.24	J	ND		ND		ND	
TMW04	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	2.7		1.6		1.7		2.8	
TMW04	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	2.2		2.3		2.9		2.4	
TMW04	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	ND		2.4		2.1		2.3	
TMW04	Nitrobenzene	98-95-3	ND		2.3		ND		5.4	
TMW04	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetra (HMX)	2691-41-0	4.7		ND		ND		ND	
TMW04	Trinitrobenzene, 1,3,5-	99-35-4	4		3.3		4.4		5.2	
TMW06	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	1.9		ND		ND		ND	
TMW11	Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	121-82-4	ND		ND		0.44		0.43	J
TMW14A	Dinitrobenzene, 1,3-	99-65-0	0.3		ND		ND		ND	
TMW14A	Dinitrotoluene, 2,4-	121-14-2	0.45		ND		ND		ND	
TMW14A	Dinitrotoluene, 2-Amino-4,6-	35572-78-2	0.13	J	ND		ND		ND	
TMW14A	Dinitrotoluene, 4-Amino-2,6-	19406-51-0	0.18	J	ND		ND		ND	
TMW14A	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	0.13	J	ND		ND		ND	
TMW14A	Nitrobenzene	98-95-3	0.76		ND		ND		ND	
TMW14A	Nitrotoluene, o-	88-72-2	0.18	J	ND		ND		ND	
TMW14A	Trinitrobenzene, 1,3,5-	99-35-4	0.38		ND		ND		ND	
TMW14A	Trinitrotoluene, 2,4,6-	118-96-7	0.32		ND		ND		ND	

Table 5-10

**Table 5-10: 2008-2009 Total Explosives Detected**

ANALYTICAL METHOD 8330 RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW23	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	34		31		40		12	J
TMW23	Nitrobenzene	98-95-3	0.43		0.25		ND		ND	
TMW23	Tetryl (Trinitrophenylmethylnitramine)	479-45-8	0.76		ND		ND		ND	
TMW23	Trinitrobenzene, 1,3,5-	99-35-4	0.57		0.38		ND		ND	

*J: Is an estimate, but detected*

*Flag: Final Qualifier*

*ug/L: Micrograms per Liter*

*NS: Not Sampled*

*ND: None Detection*



**Table 5-11: 2008-2009 Perchlorate Detected**

ANALYTICAL METHOD 6850 RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW02	Perchlorate	14797-73-0	0.692		0.598		0.6		0.59	
CMW10	Perchlorate	14797-73-0	ND		ND		0.41		0.66	
CMW14	Perchlorate	14797-73-0	0.0799	J	ND		ND		ND	
CMW17	Perchlorate	14797-73-0	1.27		1.35		1.6		ND	
CMW18	Perchlorate	14797-73-0	4.91	J	4.05		4.5		4.8	
CMW19	Perchlorate	14797-73-0	0.133	J	0.0829	J	ND		ND	
EMW01	Perchlorate	14797-73-0	1.63		2.91		0.52		3.5	
KMW09	Perchlorate	14797-73-0	0.305		ND		ND		ND	
KMW10	Perchlorate	14797-73-0	2.16	J	2.25		2.2		3	
KMW11	Perchlorate	14797-73-0	0.654	J	0.530		0.51		0.52	
MW02	Perchlorate	14797-73-0	ND		ND		0.17	J	ND	
MW20	Perchlorate	14797-73-0	ND		ND		ND		0.44	
MW225	Perchlorate	14797-73-0	ND		0.357		ND		ND	
MW22D	Perchlorate	14797-73-0	ND		ND		0.5		ND	
MW22S	Perchlorate	14797-73-0	ND		0.125	J	ND		ND	
TMW01	Perchlorate	14797-73-0	204		228		240		260	
TMW02	Perchlorate	14797-73-0	0.925		0.786		1.1		1.9	
TMW03	Perchlorate	14797-73-0	0.672		0.368		0.87		1	
TMW04	Perchlorate	14797-73-0	0.187	J	0.165	J	0.3		0.85	
TMW05	Perchlorate	14797-73-0	2290		<b>NS</b>		<b>NS</b>		<b>NS</b>	
TMW10	Perchlorate	14797-73-0	ND		0.0752	J	ND		ND	
TMW11	Perchlorate	14797-73-0	ND		0.0847	J	0.18	J	0.12	J
TMW15	Perchlorate	14797-73-0	ND		0.0985	J	ND		ND	
TMW16	Perchlorate	14797-73-0	ND		0.314		ND		ND	
TMW29	Perchlorate	14797-73-0	ND		0.179	J	0.18	J	ND	

J: Is an estimate, but detected

Flag: Final Qualifier

ug/L: Micrograms per Liter

**NS: Not Sampled**

ND: None Detection

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW04	Bromomethane	74-83-9	0.16	J	ND		ND		ND	
CMW04	Carbon Disulfide	75-15-0	ND		5.9		4.6		2.8	
CMW04	Chloromethane	74-87-3	0.68		ND		ND		0.1	J
CMW04	Dioxane, 1,4-	123-91-1	ND		24	J	ND		ND	
CMW07	Dioxane, 1,4-	123-91-1	ND		26	J	ND		ND	
CMW10	Benzene	71-43-2	ND		ND		0.11	J	ND	
CMW10	Chloromethane	74-87-3	ND		ND		ND		0.2	J
CMW10	Dichloroethane, 1,2-	107-06-2	ND		ND		0.051	J	ND	
CMW14	Acetone	67-64-1	28		18		19		20	
CMW14	Benzene	71-43-2	1		1.6		1.2		1.3	
CMW14	Carbon Disulfide	75-15-0	0.2	J	0.32	J	ND		ND	
CMW14	Chlorobenzene	108-90-7	0.1	J	ND		0.13	J	0.1	J
CMW14	Chloromethane	74-87-3	0.44	J	3.1	J	1.4		1.8	
CMW14	Methyl Ethyl Ketone (2-Butanone)	78-93-3	3.2	J	ND		2.2	J	1.9	J
CMW14	Methyl Isobutyl Ketone	108-10-1	ND		ND		0.21	J	ND	
CMW17	Acetone	67-64-1	ND		ND		ND		14	J
CMW17	Carbon Disulfide	75-15-0	ND		ND		5.7		4.5	J
CMW17	Dioxane, 1,4-	123-91-1	ND		16	J	ND		ND	
CMW17	Methyl acetate	79-20-9	ND		ND		ND		0.88	J
CMW17	Methyl Ethyl Ketone (2-Butanone)	78-93-3	ND		ND		ND		1.1	J
CMW18	Dioxane, 1,4-	123-91-1	ND		26	J	ND		ND	
CMW19	Acetone	67-64-1	2.2	J	ND		ND		ND	
CMW19	Benzene	71-43-2	0.14	J	ND		0.18	J	ND	
CMW19	Carbon Disulfide	75-15-0	ND		ND		11		4	J
CMW19	Chloromethane	74-87-3	0.24	J	ND		1.3		0.5	J
CMW19	Dioxane, 1,4-	123-91-1	ND		24	J	ND		ND	
CMW19	Methylene Chloride	75-09-2	ND		ND		ND		0.2	J
CMW20	Acetone	67-64-1	2.7	J	ND		ND		ND	
CMW20	Chloromethane	74-87-3	0.082	J	ND		ND		ND	
CMW21	Carbon Disulfide	75-15-0	ND		0.12	J	ND		ND	
CMW22	Carbon Disulfide	75-15-0	ND		2.5		ND		ND	
CMW23	Carbon Disulfide	75-15-0	570	J	6.5		ND		ND	
CMW23	Chloromethane	74-87-3	ND		ND		0.11	J	ND	

Table 5-12

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW23	Methyl Isobutyl Ketone	108-10-1	3.2	J	ND		ND		ND	
CMW24	Bromomethane	74-83-9	0.2	J	ND		ND		ND	
CMW24	Carbon Disulfide	75-15-0	5.9		81		100	J	18	
CMW24	Chloroform	67-66-3	ND		0.16	J	ND		ND	
CMW24	Chloromethane	74-87-3	0.84		ND		ND		ND	
CMW25	Bromomethane	74-83-9	0.15	J	ND		ND		ND	
CMW25	Carbon Disulfide	75-15-0	ND		4.2		2.4		2.3	
CMW25	Chloroform	67-66-3	ND		ND		0.071	J	ND	
CMW25	Chloromethane	74-87-3	0.62		ND		ND		ND	
CMW25	Dichloroethane, 1,2-	107-06-2	ND		ND		0.057	J	ND	
CMW25	Methylene Chloride	75-09-2	ND		ND		ND		0.1	J
CMW25	Toluene	108-88-3	ND		ND		0.8	J	ND	
EMW01	Acetone	67-64-1	75		29		17		6.1	
EMW01	Benzene	71-43-2	0.29	J	0.24	J	0.16	J	ND	
EMW01	Bromomethane	74-83-9	0.2	J	ND		ND		ND	
EMW01	Carbon Disulfide	75-15-0	ND		7.7		ND		ND	
EMW01	Chloromethane	74-87-3	1.5		3		ND		0.2	J
EMW01	Ethylbenzene	100-41-4	0.088	J	0.22	J	ND		ND	
EMW01	Methyl Ethyl Ketone (2-Butanone)	78-93-3	11		7.8		2.2	J	ND	
EMW01	Methyl Isobutyl Ketone	108-10-1	1.5	J	2.3	J	0.39	J	ND	
EMW01	Vinyl chloride	75-01-4	ND		ND		0.088	J	ND	
EMW01	Xylene, o-	95-47-6	0.1	J	ND		ND		ND	
EMW02	Carbon Disulfide	75-15-0	1.2		ND		ND		ND	
EMW02	Dioxane, 1,4-	123-91-1	ND		27	J	ND		ND	
EMW03	Acetone	67-64-1	6.2		12		ND		ND	
EMW03	Carbon Disulfide	75-15-0	ND		3.9		ND		ND	
EMW03	Chloromethane	74-87-3	0.25	J	2.5		ND		ND	
EMW03	Methyl Isobutyl Ketone	108-10-1	1.1	J	ND		ND		ND	
EMW03	Methylene Chloride	75-09-2	ND		ND		ND		0.2	J
EMW04	Chloroform	67-66-3	ND		ND		0.083	J	ND	
EMW04	Methylene Chloride	75-09-2	ND		ND		ND		0.1	J
EMW04	Toluene	108-88-3	ND		ND		ND		35	
FW10	Bromodichloromethane	75-27-4	0.29	J	ND		ND		ND	

Table 5-12

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
FW10	Bromoform	75-25-2	0.33	J	ND		ND		ND	
FW10	Chloromethane	74-87-3	0.084	J	ND		ND		ND	
FW10	Dibromochloromethane	124-48-1	0.2	J	ND		ND		ND	
FW10	Dioxane, 1,4-	123-91-1	ND		620		ND		ND	
FW10	Trichloroethylene	79-01-6	1.3		ND		ND		ND	
FW31	Bromomethane	74-83-9	ND		ND		0.15	J	NS	
FW31	Carbon Disulfide	75-15-0	650	J	180		4.2	J	NS	
FW31	Chloroform	67-66-3	ND		ND		0.095	J	NS	
FW31	Chloromethane	74-87-3	ND		ND		0.12	J	NS	
FW31	Cumene	98-82-8	0.6		ND		ND		NS	
FW31	Styrene	100-42-5	0.07	J	ND		ND		NS	
FW35	Acetone	67-64-1	ND		31		ND		NS	
FW35	Carbon Disulfide	75-15-0	10		48		ND		ND	
FW35	Methyl Ethyl Ketone (2-Butanone)	78-93-3	ND		2.6	J	ND		ND	
KMW09	Bromomethane	74-83-9	0.088	J	ND		ND		ND	
KMW09	Carbon Disulfide	75-15-0	ND		0.44	J	ND		ND	
KMW09	Chloromethane	74-87-3	0.28	J	ND		ND		ND	
KMW10	Acetone	67-64-1	1.4	J	ND		ND		ND	
KMW10	Tetrachloroethylene	127-18-4	ND		ND		0.21	J	0.3	J
KMW10	Toluene	108-88-3	ND		ND		0.74	J	ND	
KMW11	Dioxane, 1,4-	123-91-1	ND		32	J	ND		ND	
KMW11	Tetrachloroethylene	127-18-4	3.1	J	2.6		1.5		1.8	
KMW12	Bromomethane	74-83-9	ND		ND		0.14	J	ND	
KMW12	Carbon Disulfide	75-15-0	ND		1.1	J	1.8	J	ND	
KMW12	Toluene	108-88-3	ND		ND		ND		18	
MW01	Acetone	67-64-1	ND		3.1	J	ND		ND	
MW01	Chloromethane	74-87-3	0.081	J	ND		ND		ND	
MW01	Dichloroethane, 1,2-	107-06-2	1.5		ND		1.1		1.2	J
MW01	Dioxane, 1,4-	123-91-1	ND		69	J	ND		ND	
MW01	Methyl tert-Butyl Ether (MTBE)	1634-04-4	ND		ND		0.16	J	ND	
MW02	Acetone	67-64-1	ND		11	J	ND		ND	
MW02	Carbon Disulfide	75-15-0	1.3	J	7.1	J	ND		ND	
MW02	Chloroform	67-66-3	ND		ND		0.099	J	ND	
MW02	Chloromethane	74-87-3	ND		0.95	J	ND		ND	

Table 5-12

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
MW02	Dichloroethane, 1,2-	107-06-2	3.7	J	ND		1.4		0.7	
MW02	Dioxane, 1,4-	123-91-1	ND		73	J	ND		ND	
MW02	Methyl tert-Butyl Ether (MTBE)	1634-04-4	ND		ND		0.49	J	0.4	J
MW02	Toluene	108-88-3	ND		ND		0.88	J	ND	
MW03	Carbon Disulfide	75-15-0	0.34	J	ND		ND		ND	
MW03	Dichloroethane, 1,2-	107-06-2	0.14	J	ND		0.18	J	ND	
MW03	Dioxane, 1,4-	123-91-1	ND		56	J	ND		ND	
MW18D	Acetone	67-64-1	0.17	J	8	J	ND		ND	
MW18D	Carbon Disulfide	75-15-0	0.47	J	3	J	ND		1.2	
MW18D	Dichloroethane, 1,2-	107-06-2	128.48		93	J	92		120	
MW20	Acetone	67-64-1	9.3		ND		ND		ND	
MW20	Benzene	71-43-2	ND		ND		0.32	J	ND	
MW20	Bromomethane	74-83-9	0.63		1	J	ND		1.2	J
MW20	Carbon Disulfide	75-15-0	0.11	J	0.12	J	ND		ND	
MW20	Chloromethane	74-87-3	0.17	J	2.2	J	ND		0.4	J
MW20	Cyclohexane	110-82-7	ND		ND		0.11	J	ND	
MW20	Dichloroethane, 1,1-	75-34-3	0.19	J	ND		0.12	J	0.2	J
MW20	Dichloroethane, 1,2-	107-06-2	9.1		ND		6.8		10	J
MW20	Ethylbenzene	100-41-4	ND		ND		0.082	J	ND	
MW20	Toluene	108-88-3	ND		ND		1		0.2	J
MW22D	Carbon Disulfide	75-15-0	0.14	J	ND		ND		ND	
MW22D	Dichloroethane, 1,2-	107-06-2	0.47	J	ND		0.29	J	0.32	J
MW22S	Acetone	67-64-1	ND		2.5	J	ND		ND	
MW22S	Dichloroethane, 1,1-	75-34-3	0.52		ND		0.54		0.6	
MW22S	Dichloroethane, 1,2-	107-06-2	2.9		1.3		1.2		0.7	
MW22S	Dichloroethylene, 1,1-	75-35-4	0.085	J	ND		ND		ND	
MW22S	Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.25	J	ND		0.22	J	ND	
MW22S	Trichloroethane, 1,1,1-	71-55-6	3.8		1.4		3.1		3.4	
SMW01	Bromodichloromethane	75-27-4	0.12	J	ND		ND		ND	
SMW01	Bromoform	75-25-2	0.16	J	ND		ND		ND	
SMW01	Chloromethane	74-87-3	0.14	J	ND		ND		ND	
SMW01	Dibromochloromethane	124-48-1	0.07	J	ND		ND		ND	
TMW01	Carbon Disulfide	75-15-0	ND		0.14	J	ND		ND	
TMW01	Dioxane, 1,4-	123-91-1	ND		9.1	J	ND		ND	

Table 5-12

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW02	Carbon Disulfide	75-15-0	0.52		0.18	J	ND		ND	
TMW02	Chloromethane	74-87-3	ND		0.13	J	ND		ND	
TMW03	Chloromethane	74-87-3	0.2	J	ND		ND		ND	
TMW04	Chloroform	67-66-3	ND		ND		0.084	J	ND	
TMW04	Toluene	108-88-3	ND		ND		1.1	J	ND	
TMW06	Carbon Disulfide	75-15-0	0.3	J	ND		ND		ND	
TMW07	Carbon Disulfide	75-15-0	ND		4	J	ND		ND	
TMW08	Carbon Disulfide	75-15-0	0.1	J	ND		ND		ND	
TMW08	Chloromethane	74-87-3	0.085	J	ND		ND		ND	
TMW08	Dioxane, 1,4-	123-91-1	ND		120	J	ND		ND	
TMW10	Chloroform	67-66-3	ND		ND		0.075	J	ND	
TMW11	Acetone	67-64-1	ND		3.2	J	ND		ND	
TMW11	Carbon Disulfide	75-15-0	ND		1.3		ND		ND	
TMW11	Dioxane, 1,4-	123-91-1	ND		32		ND		ND	
TMW13	Dioxane, 1,4-	123-91-1	ND		12	J	ND		ND	
TMW13	Methylene Chloride	75-09-2	ND		ND		ND		0.1	J
TMW13	Toluene	108-88-3	ND		ND		0.72	J	ND	
TMW14A	Bromomethane	74-83-9	2.3		ND		ND		ND	
TMW14A	Carbon Disulfide	75-15-0	28		11		ND		2	J
TMW14A	Chloromethane	74-87-3	2.9		2		ND		ND	
TMW14A	Dioxane, 1,4-	123-91-1	ND		100		ND		ND	
TMW14A	Methylene Chloride	75-09-2	ND		ND		ND		0.1	J
TMW14A	Trichloroethylene	79-01-6	0.19	J	0.11	J	ND		ND	
TMW15	Dioxane, 1,4-	123-91-1	ND		22	J	ND		ND	
TMW15	Methylene Chloride	75-09-2	ND		ND		0.093	J	ND	
TMW16	Bromodichloromethane	75-27-4	0.2	J	ND		ND		ND	
TMW16	Bromoform	75-25-2	0.22	J	ND		ND		ND	
TMW16	Carbon Disulfide	75-15-0	ND		2.5		ND		ND	
TMW16	Dibromochloromethane	124-48-1	0.18	J	ND		ND		ND	
TMW16	Methyl Isobutyl Ketone	108-10-1	ND		ND		ND		0.4	J
TMW16	Toluene	108-88-3	ND		ND		ND		200	
TMW17	Carbon Disulfide	75-15-0	16		42		27		18	J

Table 5-12

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW17	Chloromethane	74-87-3	2		ND		4.6		4.6	J
TMW17	Ethyl Chloride	75-00-3	0.17	J	ND		ND		ND	
TMW18	Acetone	67-64-1	5.1		ND		ND		ND	
TMW18	Carbon Disulfide	75-15-0	ND		1.4		ND		ND	
TMW18	Chloroform	67-66-3	ND		0.62		ND		ND	
TMW18	Chloromethane	74-87-3	0.84		ND		ND		0.1	J
TMW18	Ethyl Chloride	75-00-3	0.096	J	ND		ND		ND	
TMW18	Ethylbenzene	100-41-4	ND		ND		ND		0.2	J
TMW18	Methyl Isobutyl Ketone	108-10-1	ND		ND		ND		0.3	J
TMW18	Toluene	108-88-3	ND		ND		ND		1100	
TMW18	Vinyl chloride	75-01-4	0.14	J	ND		ND		ND	
TMW19	Bromomethane	74-83-9	1.8		ND		ND		ND	
TMW19	Carbon Disulfide	75-15-0	25		14		ND		ND	
TMW19	Chloromethane	74-87-3	1.2		ND		ND		ND	
TMW19	Ethyl Chloride	75-00-3	0.34	J	ND		ND		ND	
TMW19	Ethylbenzene	100-41-4	ND		ND		ND		0.2	J
TMW19	Methyl Isobutyl Ketone	108-10-1	ND		ND		ND		0.4	J
TMW19	Toluene	108-88-3	ND		ND		ND		590	
TMW19	Vinyl chloride	75-01-4	0.14	J	ND		ND		ND	
TMW21	Methylene Chloride	75-09-2	ND		ND		ND		0.1	J
TMW22	Carbon Disulfide	75-15-0	0.18	J	ND		ND		ND	
TMW22	Chloromethane	74-87-3	0.16	J	ND		ND		ND	
TMW22	Toluene	108-88-3	ND		ND		0.8	J	ND	
TMW23	Toluene	108-88-3	ND		ND		1.2		ND	
TMW24	Carbon Disulfide	75-15-0	ND		0.79	J	ND		ND	
TMW24	Toluene	108-88-3	ND		ND		1.4		ND	
TMW25	Carbon Disulfide	75-15-0	0.11	J	0.38	J	ND		ND	
TMW26	Carbon Disulfide	75-15-0	ND		0.35	J	ND		ND	
TMW26	Dioxane, 1,4-	123-91-1	ND		200		ND		ND	
TMW27	Carbon Disulfide	75-15-0	0.21	J	ND		ND		ND	
TMW27	Chloroform	67-66-3	ND		ND		0.071	J	ND	

Table 5-12

**Table 5-12: 2008 -2009 Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8260B/C RESULTS (in ug/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW27	Chloromethane	74-87-3	ND		ND		0.14	J	ND	
TMW27	Methylene Chloride	75-09-2	ND		ND		ND		0.1	J
TMW28	Carbon Disulfide	75-15-0	0.27	J	0.79		ND		ND	
TMW28	Chloromethane	74-87-3	0.096	J	ND		ND		ND	
TMW28	Dioxane, 1,4-	123-91-1	ND		22	J	ND		ND	
TMW29	Dichloroethane, 1,2-	107-06-2	0.24	J	ND		ND		ND	
TMW29	Dioxane, 1,4-	123-91-1	ND		42	J	ND		ND	

*J: Is an estimate, but detected*

*Flag: Final Qualifier*

*ug/L: Micrograms per Liter*

*NS: Not Sampled*

*ND: None Detection*



Table 5-13: 2008 -2009 Semi-Volatile Organic Compounds Detected

ANALYTICAL METHOD 8270C/D RESULTS (in mg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW10	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		6.3		ND	
CMW14	Acetophenone	98-86-2	ND		ND		ND		2.2	J
CMW14	Caprolactam	105-60-2	11		ND		3.2	J	4.2	J
CMW19	Bis(2-ethylhexyl)phthalate	117-81-7	ND		1.5	J	ND		ND	
CMW24	Nitrosodiphenylamine, N-	86-30-6	ND		ND		1.2	J	0.72	J
EMW01	Acetophenone	98-86-2	2.7	J	1.8	J	ND		ND	
EMW01	Caprolactam	105-60-2	26		21		ND		0.64	J
EMW01	Phenol	108-95-2	2.2	J	2.3	J	ND		ND	
EMW02	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		4.4	J	ND	
EMW03	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		5.2	J	ND	
EMW04	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		4.8	J	ND	
FW31	Acetophenone	98-86-2	2.6	J	ND		ND		ND	
FW35	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		ND		2	J
FW35	Caprolactam	105-60-2	7		ND		ND		ND	
FW35	Dibutyl Phthalate	84-74-2	ND		ND		ND		0.28	J
KMW10	Bis(2-ethylhexyl)phthalate	117-81-7	ND		1.5	J	ND		ND	
MW02	Acetophenone	98-86-2	2	J	ND		ND		NS	
MW18D	Bis(2-ethylhexyl)phthalate	117-81-7	ND		4.1	J	ND		NS	
MW20	Chloroaniline, p-	106-47-8	3.3	J	ND		ND		ND	
MW22S	Bis(2-ethylhexyl)phthalate	117-81-7	ND		2.3	J	ND		ND	
MW22S	Dibutyl Phthalate	84-74-2	ND		ND		ND		0.32	J
SMW01	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		6.7		ND	
TMW03	Dinitrophenol, 2,4-	51-28-5	39	J	74		30		46	
TMW04	Dinitrophenol, 2,4-	51-28-5	20	J	ND		ND		ND	
TMW06	Dibutyl Phthalate	84-74-2	0.38	J	ND		ND		ND	
TMW07	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		ND		3.2	J
TMW07	Caprolactam	105-60-2	7.1		ND		ND		ND	
TMW07	Chrysene	218-01-9	ND		ND		ND		0.8	J
TMW07	Dibutyl Phthalate	84-74-2	ND		ND		0.36	J	0.75	J
TMW07	Diethyl Phthalate	84-66-2	ND		ND		0.75	J	ND	
TMW07	Fluoranthene	206-44-0	ND		ND		ND		0.41	J
TMW16	Acetophenone	98-86-2	ND		ND		ND		2	J
TMW16	Caprolactam	105-60-2	73		46		ND		ND	

Table 5-13

**Table 5-13: 2008 -2009 Semi-Volatile Organic Compounds Detected**

ANALYTICAL METHOD 8270C/D RESULTS (in mg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW16	Cresol, o-	95-48-7	ND		ND		ND		31	
TMW18	Acetophenone	98-86-2	17	J	ND		ND		49	
TMW18	Bis(2-ethylhexyl)phthalate	117-81-7	ND		ND		50		1.3	J
TMW18	Caprolactam	105-60-2	110		ND		ND		ND	
TMW18	Chloroaniline, p-	106-47-8	4.3	J	ND		ND		ND	
TMW18	Chloronaphthalene, Beta-	91-58-7	0.63	J	ND		ND		ND	
TMW18	Cresol, o-	95-48-7	ND		ND		ND		2.3	J
TMW18	Dibutyl Phthalate	84-74-2	ND		0.26	J	ND		0.35	J
TMW18	Nitrosodiphenylamine, N-	86-30-6	2	J	ND		ND		ND	
TMW18	Phenol	108-95-2	21	J	ND		ND		160	
TMW19	Acetophenone	98-86-2	ND		ND		ND		19	J
TMW19	Caprolactam	105-60-2	220		430		ND		ND	
TMW19	Cresol, o-	95-48-7	ND		ND		ND		3.1	J
TMW19	Dibutyl Phthalate	84-74-2	ND		ND		ND		0.52	J
TMW19	Phenol	108-95-2	ND		ND		ND		180	
TMW22	Dinitrophenol, 2,4-	51-28-5	ND		ND		21		NS	
TMW23	Dibutyl Phthalate	84-74-2	ND		ND		0.4	J	NS	
TMW23	Dinitrophenol, 2,4-	51-28-5	33	J	ND		22		NS	
TMW23	Dinitrotoluene, 2,4-	121-14-2	ND		ND		1.1	J	NS	

*J: Is an estimate, but detected*

*Flag: Final Qualifier*

*ug/L: Micrograms per Liter*

*NS: Not Sampled*

*ND: None Detection*

**Table 5-14: 2008 - 2009 Diesel and Gasoline Range Organics Detected**

ANALYTICAL METHOD 8015B GRO RESULTS (in mg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
MW18D	Gasoline Range Organics	GRO	ND		ND		ND		0.012	J
MW20	Gasoline Range Organics	GRO	ND		ND		ND		0.015	J
MW22D	Gasoline Range Organics	GRO	0.017	J	ND		ND		ND	
MW22S	Gasoline Range Organics	GRO	0.11		ND		ND		ND	
ANALYTICAL METHOD 8015B DRO RESULTS (in ug/L)										
MW18D	Diesel Range Organics	DRO	52	J	ND		ND		58	
MW20	Diesel Range Organics	DRO	81		ND		ND		61	
MW22D	Diesel Range Organics	DRO	ND		ND		ND		70	
MW22S	Diesel Range Organics	DRO	67		ND		58	J	58	

*J: Is an estimate, but detected*

*Flag: Final Qualifier*

*mg/L: Milligrams per Liter*

*ug/L: Micrograms per Liter*

*ND: None Detection*

**Table 5-15: 2008-2009 Dioxin and Furans Detected**

ANALYTICAL METHOD 8290A RESULTS (in pg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
CMW02	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	ND		ND		0.58	J	ND	
CMW02	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.37	J
CMW02	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		0.621		ND	
CMW07	1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	ND		ND		1.03	J	ND	
CMW07	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.28	J
CMW07	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		2.27		ND	
CMW10	Hexachlorodibenzo-p-dioxin	34465-46-8	ND		ND		0.373		ND	
CMW18	Octachlorodibenzo-p-dioxin	3268-87-9	115420		ND		ND		ND	
CMW18	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.47	J
CMW19	Octachlorodibenzo-p-dioxin	3268-87-9	20560	J	106.34		ND		ND	
CMW19	1,2,3,4,6,7,8,9-octachlorodibenzo-p-furan	39001-02-0	5160	J	ND		ND		ND	
CMW20	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ND		27.64	J	ND		NS	
CMW21	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		27.64	J	ND		NS	
CMW22	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	ND		ND		0.835	J	ND	
CMW22	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		1.45		ND	
CMW22	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	55684-94-1	ND		11.18	J	ND		ND	
CMW22	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	36088-22-9	ND		ND		0.835		ND	
CMW22	1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	ND		ND		0.907	J	ND	
CMW22	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		0.907		ND	
CMW24	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	55684-94-1	ND		ND		0.444		ND	
CMW24	Total Pentachlorodibenzofuran	55722-27-5	ND		ND		0.304		ND	
CMW25	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.3	J
CMW25	Total Pentachlorodibenzofuran	55722-27-5	ND		ND		0.228		ND	
EMW01	Octachlorodibenzo-p-dioxin	3268-87-9	ND		19.42	J	ND		ND	
EMW02	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	62200		ND		ND		ND	
EMW02	Octachlorodibenzo-p-dioxin	3268-87-9	138220		ND		ND		ND	
EMW03	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		0.854		ND	
FW31	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	ND		ND		1.7	J	ND	
FW31	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		5.68	J	ND	
FW31	1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	ND		ND		2.1	J	ND	
FW31	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.3	J
KMW09	Octachlorodibenzo-p-dioxin	3268-87-9	11820	J	ND		ND		ND	
KMW11	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	ND		ND		1.58	J	ND	
KMW11	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	ND		ND		0.46	J	ND	

Table 5-15

**Table 5-15: 2008-2009 Dioxin and Furans Detected**

ANALYTICAL METHOD 8290A RESULTS (in pg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
KMW11	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	ND		ND		0.28	J	ND	
KMW11	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	ND		ND		0.87	J	ND	
KMW11	Hexachlorodibenzo-p-dioxin	34465-46-8	ND		ND		0.918		ND	
KMW11	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.3	J
MW22D	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ND		ND		ND		0.58	J
MW22D	Hexachlorodibenzo-p-dioxin	34465-46-8	ND		ND		0.524		ND	
MW22D	Octachlorodibenzo-p-dioxin	3268-87-9	105060		ND		ND		2.13	J
MW22D	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.28	J
MW22S	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ND		ND		ND		1.97	J
MW22S	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		2.4		1.97	
MW22S	Octachlorodibenzo-p-dioxin	3268-87-9	ND		ND		ND		22.1	
MW22S	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.438	
MW22S	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		0.989		0.991	
TMW01	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	ND		ND		ND		0.45	J
TMW01	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ND		ND		ND		0.71	J
TMW01	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	ND		ND		ND		0.45	J
TMW01	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	ND		ND		ND		0.284	J
TMW01	1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	ND		ND		ND		0.21	J
TMW01	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	ND		ND		ND		0.428	J
TMW01	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	ND		ND		ND		0.379	J
TMW01	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	ND		ND		ND		0.3	J
TMW01	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	36088-22-9	ND		ND		ND		0.379	
TMW01	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.42	J
TMW01	Total Tetrachlorodibenzo-p-dioxin	41903-57-5	ND		ND		0.914		ND	
TMW02	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	ND		ND		7.57	J	ND	
TMW02	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	ND		ND		4.3	J	0.4	J
TMW02	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	ND		ND		1.3	J	0.2	J
TMW02	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	ND		ND		1.3	J	ND	
TMW02	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	ND		ND		1.2	J	ND	
TMW02	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		2.56		ND	
TMW02	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	38998-75-3	ND		ND		10.4		ND	
TMW02	1,2,3,4,6,7,8,9-octachlorodibenzo-p-furan	39001-02-0	ND		ND		67.8		ND	
TMW02	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.49	J
TMW07	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		1.03		ND	
TMW11	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		0.507		ND	

Table 5-15

**Table 5-15: 2008-2009 Dioxin and Furans Detected**

ANALYTICAL METHOD 8290A RESULTS (in pg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW13	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	ND		ND		7.85	J	ND	
TMW13	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	ND		ND		1.96	J	ND	
TMW13	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		1.14		ND	
TMW13	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	38998-75-3	ND		ND		10.1		ND	
TMW13	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	55684-94-1	ND		ND		4.09		ND	
TMW13	Octachlorodibenzo-p-dioxin	3268-87-9	ND		40.84	J	ND		ND	
TMW13	1,2,3,4,6,7,8,9-octachlorodibenzo-p-furan	39001-02-0	ND		ND		58.9		ND	
TMW13	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.276	J
TMW13	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		1.09		0.302	
TMW14	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ND		6.18	J	ND		ND	
TMW14A	Hexachlorodibenzo-p-dioxin	34465-46-8	ND		ND		0.476		0.611	
TMW14A	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	57200		ND		ND		ND	
TMW14A	Octachlorodibenzo-p-dioxin	3268-87-9	666520		ND		ND		ND	
TMW14A	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.46	J
TMW15	1,2,3,4,6,7,8,9-octachlorodibenzo-p-furan	39001-02-0	ND		5.1	J	ND		ND	
TMW15	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.29	J
TMW16	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		5.06	J	ND	
TMW19	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	36088-22-9	ND		ND		0.989		ND	
TMW23	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	ND		ND		9.11	J	0.58	J
TMW23	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ND		ND		ND		1.94	J
TMW23	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	ND		ND		4.5	J	ND	
TMW23	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	ND		ND		2.2	J	0.24	J
TMW23	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	ND		ND		0.73	J	0.48	J
TMW23	1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	ND		ND		ND		0.19	J
TMW23	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	ND		ND		1.87	J	ND	
TMW23	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	ND		ND		1.6	J	0.21	J
TMW23	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	ND		ND		ND		0.543	J
TMW23	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	ND		ND		0.95	J	0.31	J
TMW23	Hexachlorodibenzo-p-dioxin	34465-46-8	ND		ND		1.87		ND	
TMW23	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	37871-00-4	ND		ND		2.08		ND	
TMW23	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	38998-75-3	ND		ND		11.1		ND	
TMW23	Octachlorodibenzo-p-dioxin	3268-87-9	ND		ND		ND		14.2	J
TMW23	1,2,3,4,6,7,8,9-octachlorodibenzo-p-furan	39001-02-0	ND		ND		85.2		ND	
TMW23	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.35	J

Table 5-15

**Table 5-15: 2008-2009 Dioxin and Furans Detected**

ANALYTICAL METHOD 8290A RESULTS (in pg/L)										
Well ID	Analyte	CASNR	April-08		October-08		April-09		October-09	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag
TMW23	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		2.87		ND	
TMW27	Hexachlorodibenzo-p-dioxin	34465-46-8	ND		ND		ND		0.2	
TMW27	1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	ND		ND		0.57	J	ND	
TMW27	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ND		ND		ND		0.346	J
TMW27	Total Pentachlorodibenzofuran	30402-15-4	ND		ND		ND		0.346	
TWM07	Octachlorodibenzo-p-dioxin	3268-87-9	372680		ND		ND		ND	

*J: Is an estimate, but detected*

*Flag: Final Qualifier*

*pg/L: Picograms per Liter*

*NS: Not Sampled*

*ND: None Detection*

**Table 5-16: Ground Water Purge Records**

Well ID	Casing Dia. (in)	Well TD (ft-btbc)	Screen Length (ft)	Date	Purge Method	Beginning DTW (ft-btbc)	Ending DTW (ft-btbc)	Purge Time	Average Flow Rate (mL/m)	Purge Volume	pH	Cond. (uS/cm)	Temp (c)	Turbidity (NTU)	DO (mg/L)
CMW02	2	37.9	10	23-Oct-09	ZIST low flow	14.62	14.62	30 min	140	2.1 L	8.41	782	10.99	2.24	0.03
CMW04	2	137.91	20	23-Oct-09	ZIST low flow	45.12	45.12	23 min	100	2.53 L	8.42	5150	12.50	1.01	0.05
CMW07	2	66.6	20	23-Oct-09	Low flow	39.2	39.2	21 min	90	1.89 L	7.93	1520	12.02	0.63	0.06
CMW10	2	73.1	20	26-Oct-09	Bailed dry	64.75	Dry	55 min	N/A	7.0 G	11.61	4110	11.42	392.0	4.71
CMW14	2	96.75	10	23-Oct-09	ZIST low flow	16.23	16.23	18 min	170	3.4 L	13.67	5960	11.08	2.61	0.07
CMW17	2	54.24	20	26-Oct-09	Bailed dry	16.56	Dry	NR	NR	7.0 G	NR	NR	NR	NR	NR
CMW18	2	54.1	20	23-Oct-09	Low flow	41.05	41.1	18 min	170	3.06 L	7.5	912	11.98	1.28	0.07
CMW19	2	51.3	15	26-Oct-09	ZIST low flow	51.3	24.15	24 min	NR	1.0 G	9.85	1313	12.80	37.20	0.79
CMW22	2	120.23	20	15-Oct-09	Bailed dry	114.52	0	20 min	N/A	1.0 G	8.92	699	12.29	>1000	3.3
CMW23	2	106.6	20	15-Oct-09	Bailed dry	97.14	Dry	20 min	N/A	1.5 G	8.94	3740	12.59	572.4	2.63
CMW24	2	262.34	30	22-Oct-09	ZIST low flow	46.91	46.91	18 min	140	1.52 L	8.60	2710	13.96	91.85	0.05
CMW25	2	98.78	25	16-Oct-09	Low flow	37.21	52.15	162 min	30 to 220	14.06 L	8.85	1057	21.46	2.64	0.81
KMW09	2	72.9	10	15-Oct-09	ZIST low flow	39.20	39.20	44 min	90	3.96 L	8.03	3560	12.80	0.22	1.31
KMW10	2	171.02	10	16-Oct-09	Bailed dry	166.93	Dry	25 min	N/A	0.75 G	7.40	895	12.85	50.76	5.91
KMW11	2	57.44	20	22-Oct-09	Low flow	32.40	32.60	18 min	160	2.88 L	8.75	997	11.60	158.0	0.03
KMW12	2	75.49	20	16-Oct-09	Bennett pump	48.58	Dry	24 min	N/A	13 G	7.72	4080	11.41	10.50	0.15
KMW13	2	53.83	20												
FW31	4	52	40	16-Oct-09	12-Volt Pump	41.33	Dry	20 min	N/A	10 G	8.39	2350	12.78	12.8	0.1
TMW01	2	61.23	15	14-Oct-09	Low flow	36.04	36.06	47 min	50	2.35 L	7.65	2810	15.91	4.87	2.91
TMW02	2	84.09	14	14-Oct-09	Low flow	55.15	55.1	45 min	125	3.75 L	8.22	4470	13.85	10.54	6.34
TMW03	2	72.06	20	14-Oct-09	Low flow	56.92	57.11	30 min	275	8.25 L	7.8	4320	14.54	13.85	2.26
TMW04	2	72.36	20	14-Oct-09	Low flow	56.36	57.44	35 min	260	9.1 L	7.97	3940	13.74	246.9	2.58
TMW05	2	37.61	10												
TMW06	2	57.24	10	17-Oct-09	Low flow	47.30	47.36	50 min	50	1.8 L	7.52	4950	15.92	1.20	1.61
TMW07	2	67.37	10	19-Oct-09	Bailed dry	47.78	Dry	3.25 hrs	N/A	6.0 G	7.81	5340	13.20	459.0	3.93
TMW08	2	62.41	30	17-Oct-09	Low flow	36.65	36.65	35 min	50	1.75 G	7.38	1640	14.82	78.42	1.28
TMW10	2	61.8	30	19-Oct-09	Low flow	36.99	37.20	25 min	100	2.5 L	7.65	6740	15.20	7.09	0.06
TMW11	2	82.68	25	20-Oct-09	Low flow	66.70	66.72	57 min	40	2.28 L	7.95	2200	18.05	49.05	2.62
TMW13	2	73.78	10	22-Oct-09	Low flow	60.10	60.11	44 min	70	3.08 L	7.51	2350	14.45	0.33	1.62
TMW14A	2	112.2	15	27-Oct-09	ZIST low flow	63.44	63.72	70 min	50	3.55 L	8.78	1890	12.54	1.90	0.83
TMW15	2	76.65	15	26-Oct-09	Low flow	64.56	64.41	60 min	60	2.70 L	7.61	2300	13.07	1.55	1.85
TMW16	2	142.2	15	15-Oct-09	Bennett pump	55.40	Dry	37 min	N/A	20 G	8.67	2170	12.92	568.0	1.01
TMW17	2	130.45	15	23-Oct-09	ZIST low flow	The sample data form was lost - the record of the well being sampled is located in fieldbook #14, pg 59									
TMW18	2	160.7	10	14-Oct-09	Bennett pump	54.36	Dry	45 min	N/A	17.5 G	11.15	3040	13.13	113.7	0.18
TMW19	2	187.97	15	15-Oct-09	Bennet pump	42.33	Dry	53 min	N/A	26 G	8.55	2480	12.94	1315	0.82
TMW21	2	61.43	10	24-Oct-09	Low flow	51.31	52.01	87 min	100	8.7 L	7.71	2640	14.28	131.1	0.83
TMW22	2	65.23	10	13-Oct-09	Bailed dry	48.79	Dry	20 min	N/A	4.0 G	7.77	3490	12.85	<1000	0.24
TMW23	2	59.57	10	13-Oct-09	Bailed dry	45.58	Dry	20 min	N/A	3.5 G	7.79	3250	13.05	110.60	0.40
TMW24	2	57.41	10	19-Oct-09	Low flow	40.34	40.40	52 min	25	1.35 L	7.84	3840	19.97	1.88	2.12
TMW25	2	55	10	23-Oct-09	Low flow	The sample data form was lost - the record of the well being sampled is located in fieldbook #14, pg 57									
TMW26	2	58.24	10	17-Oct-09	Low flow	26.66	26.66	17 min	130	2.34 L	7.96	3590	14.67	39.68	1.01
TMW27	2	73.26	10	24-Oct-09	Low flow	29.90	29.90	24 min	140	3.36	7.77	1530	14.07	3.10	1.10
TMW28	2	50.3	10	19-Oct-09	Low flow	18.83	19.10	15 min	60	0.88 L	7.65	1590	17.38	25.80	0.08
TMW29	2	61.65	10	14-Oct-09	Bailed dry	61.65	Dry	25 min	N/A	2.0 G	7.88	2520	12.76	705.40	4.41
EMW01	2	120.7	15	15-Oct-09	Low flow	The sample data form was lost - the record of the well being sampled is located in fieldbook #14, pg 39									
EMW02	2	108.4	15	15-Oct-09	Pumped Dry	NR	Dry	NR	N/A	NR	8.28	1850	14.00	1.57	1.33

Table 5-16



**Table 5-16: Ground Water Purge Records**

Well ID	Casing Dia. (in)	Well TD (ft-btoc)	Screen Length (ft)	Date	Purge Method	Beginning DTW (ft-btoc)	Ending DTW (ft-btoc)	Purge Time	Average Flow Rate (mL/m)	Purge Volume	pH	Cond. (uS/cm)	Temp (c)	Turbidity (NTU)	DO (mg/L)
EMW03	2	92.9	15	16-Oct-09	Low flow	87.20	87.25	40 min	70	3.25 L	11.38	NR	14.85	5.23	1.24
EMW04	2	115	15	14-Oct-09	Bennett pump	99.25	Dry	25 min	N/A	8.0 G	7.65	1246	13.62	19.70	0.26
FW35	4	32.15	20	16-Oct-09	12 Volt Pump	19.43	Dry	12 min	N/A	14 G	6.88	4210	11.94	111.6	0.14
MW01	4	54.8	20	13-Oct-09	Bailed dry	NR	Dry	13 min	N/A	4.0 G	7.63	3560	14.58	366.8	2.99
MW02	2	49.45	10	13-Oct-09	Bailed dry	NR	Dry	10 min	N/A	2.0 G	7.00	2450	14.80	>1000	3.34
MW03	2	56.2	10	23-Oct-09	Low flow	46.08	46.12	45 min	60	2.7 L	7.28	5380	14.38	0.61	1.52
MW18D	2	59.9	10	23-Oct-09	Low flow	The sample data form was lost - the record of the well being sampled is located in fieldbook #14, pg 58									
MW18S	2	38.28	10			<b>Dry</b>									
MW20	2	59.4	10	23-Oct-09	Low flow	45.04	45.12	59 min	70	4.0 L	6.87	1900	13.81	4.3	1.14
MW22D	2	58.7	10	21-Oct-09	Low flow	41.47	41.52	104 min	100	10.35 L	7.34	5330	14.12	0.64	0.9
MW22S	2	43.54	10	19-Oct-09	Bailed dry	43.28	Dry	10 min	N/A	0.75 G	7.41	4640	15.17	137.1	5.66
SMW01	2	52.15	20	24-Oct-09	Low flow	32.00	32.00	30 min	70	2.1 L	7.75	2050	11.62	7.07	1.28

*in: Inches*

*ft-btoc: Feet Below Top of Casing*

*ft: Feet*

*ml/min: Milliliters per Minute*

*us/cm: Microsiemens per Centimeter*

*Temp (c): Temperature in Celsius*

*NTU: Nephelometric Turbidity Units*

*ZIST: Zone Isolation System Technology*

*L: Liters*

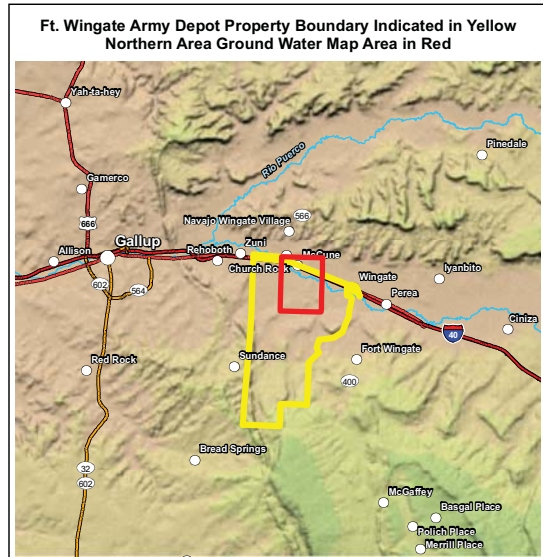
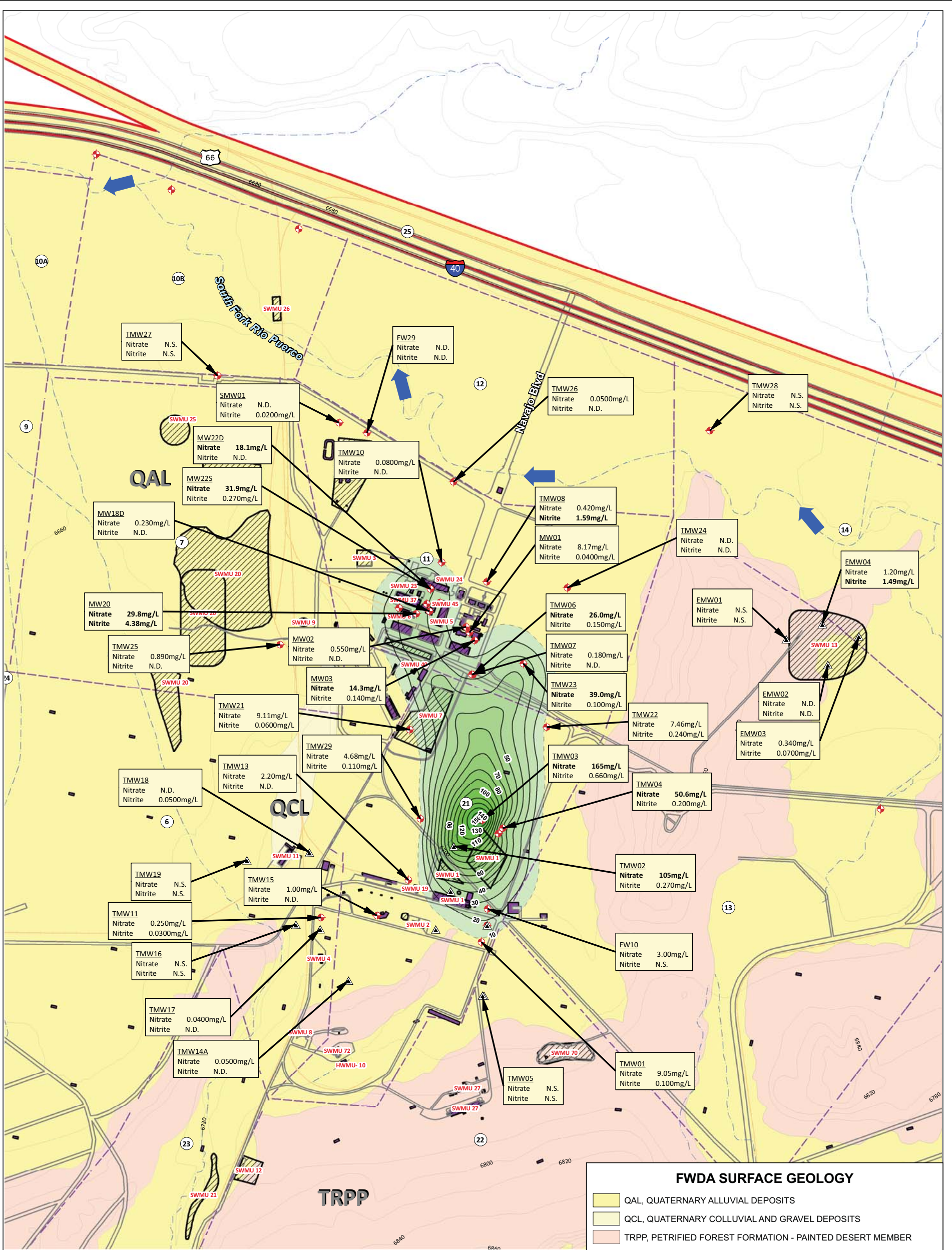
*G: Gallons*

*min: Minutes*

*NR: Not Recorded*

*N/A: Not Applicable*

*mg/L: Milligrams per Liter*



- NORTHERN AREA ALLUVIAL MONITORING WELLS
- NORTHERN AREA BEDROCK MONITORING WELLS
- FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- NITRATE CONCENTRATION (10 MG/L INTERVAL)
- REGULATORY LIMIT FOR NITRATE (10 MG/L)
- SOLID WASTE MANAGEMENT UNIT (SWMU)
- HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- BUILDINGS
- FWDA PROPERTY BOUNDARY, FEB 2002
- PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 5-1 Northern Area Nitrate and Nitrite Concentrations/Nitrate Plume**

0.25 Miles  
0.25 Kilometers

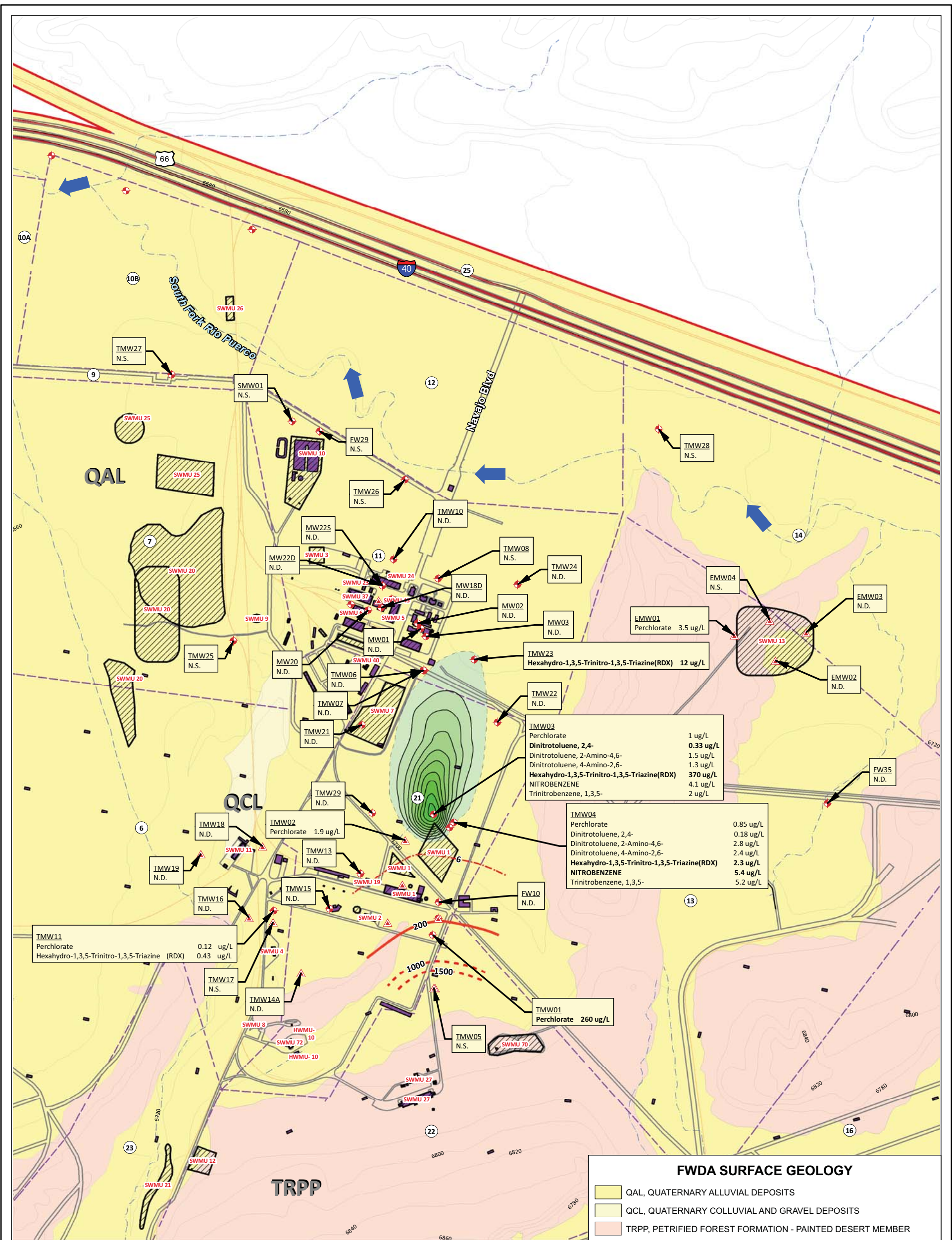
State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.

Map Scale: 1:12,000 (1"=1000')  
Map Date: June 4, 2010

Units: mg/L, milligrams per liter.  
N.D., not detected; N.S., not sampled.

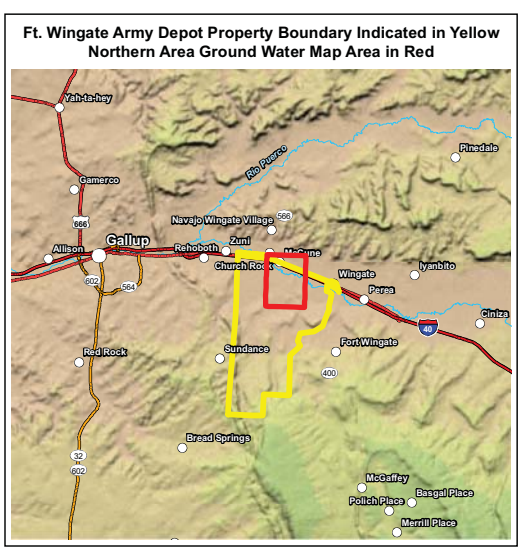
Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry



**FWDA SURFACE GEOLOGY**

	QAL, QUATERNARY ALLUVIAL DEPOSITS
	QCL, QUATERNARY COLLUVIAL AND GRAVEL DEPOSITS
	TRPP, PETRIFIED FOREST FORMATION - PAINTED DESERT MEMBER



- PIEZOMETERS
- NORTHERN AREA ALLUVIAL MONITORING WELLS
- NORTHERN AREA BEDROCK MONITORING WELLS
- FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- REGULATORY LIMIT FOR PERCHLORATE (6 UG/L)
- PERCHLORATE CONTOUR (IRREGULAR INTERVAL)
- PERCHLORATE CONTOUR (ESTIMATED) (IRREGULAR INTERVAL)
- RDX CONCENTRATION (40 UG/L INTERVAL)
- REGULATORY LIMIT FOR RDX (0.61 UG/L)
- SOLID WASTE MANAGEMENT UNIT (SWMU)
- HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- ADJOINING PROPERTY BOUNDARY
- BUILDINGS
- FWDA PROPERTY BOUNDARY, FEB 2002
- PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 5-2 Northern Area Ground Water Chemical Analytical Results Methods 6850 and 8330 (RDX and Perchlorate)**  
0.25 Miles

0.25 Kilometers

State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.

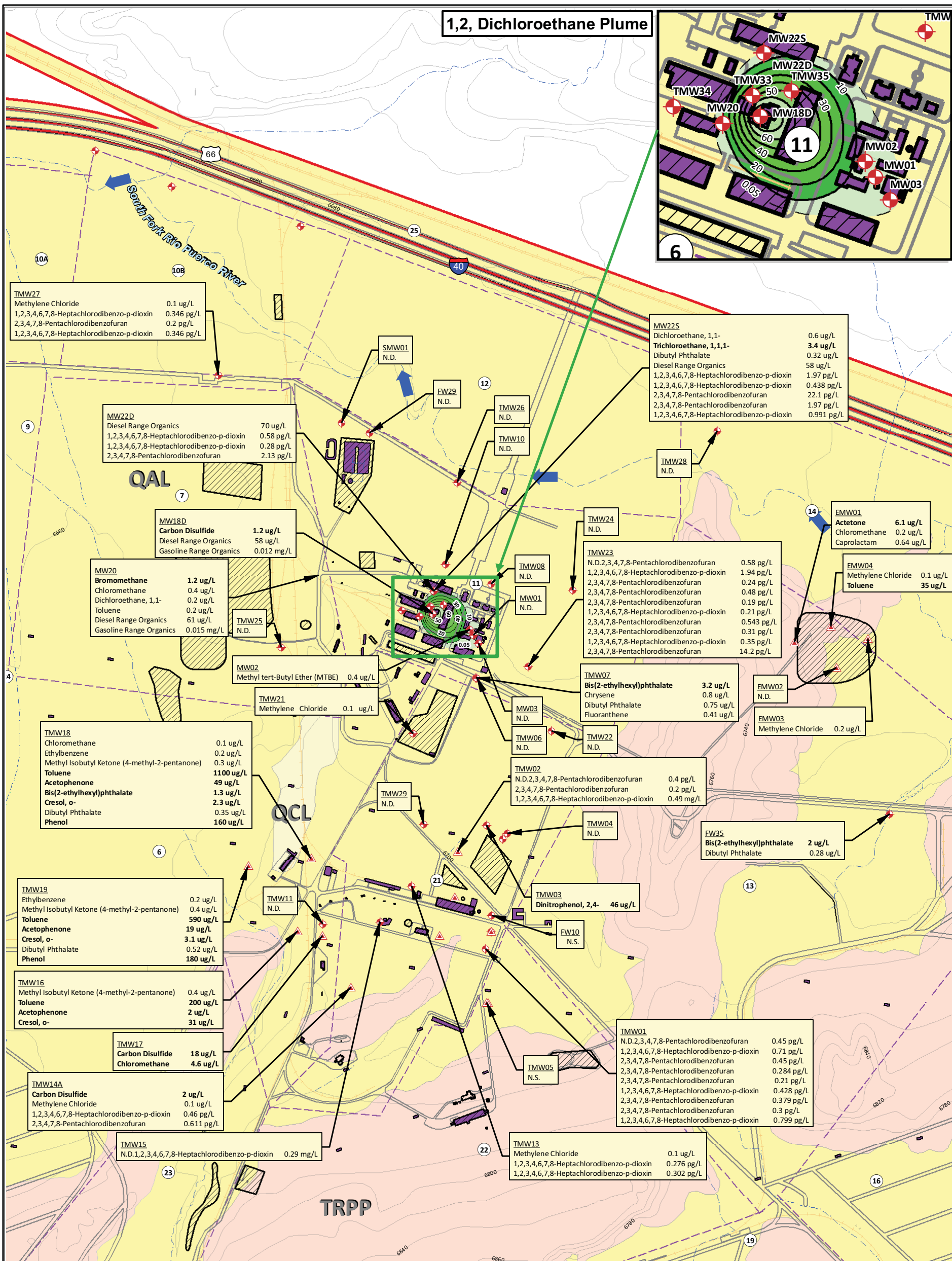
Map Scale: 1:12,000  
Map Date: June 4, 2010

Units: ug/L, micrograms per liter.  
N.D., not detected; N.S., not sampled.

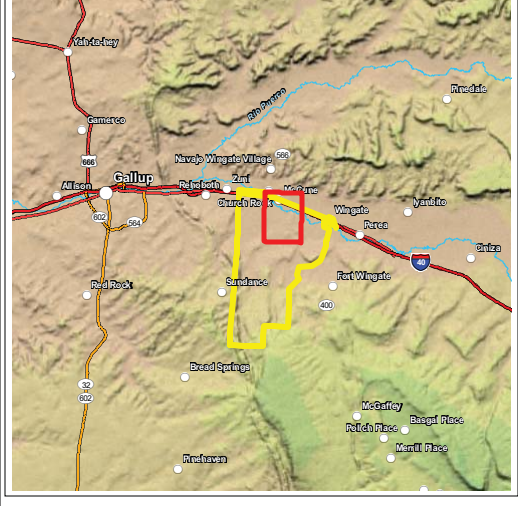
Data sources: drainages, railroad, roads: Tele Atlas  
GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry

# 1,2, Dichloroethane Plume

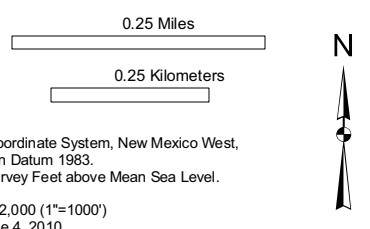


Ft. Wingate Army Depot Property Boundary Indicated in Yellow Northern Area Ground Water Map Area in Red



- ◆ NORTHERN AREA ALLUVIAL MONITORING WELLS
- ▲ NORTHERN AREA BEDROCK MONITORING WELLS
- ➡ FLOW DIRECTION OF THE SOUTH FORK RIO PUERCO
- 1,2-DICHLOROETHANE CONCENTRATION (10 UG/L INTERVAL)
- 1,2-DICHLOROETHANE REGULATORY LIMIT (0.05 UG/L)
- ▨ SOLID WASTE MANAGEMENT UNIT (SWMU)
- ▨ HAZARDOUS WASTE MANAGEMENT UNIT (HWMU)
- ▨ BUILDINGS
- ▭ FWDA PROPERTY BOUNDARY, FEB 2002
- ⑦ PROPERTY TRANSFER PARCEL IDENTIFICATION NUMBER
- - - PROPERTY TRANSFER PARCEL BOUNDARY
- RAILROAD
- ROAD
- ARROYO
- USGS TOPOGRAPHIC CONTOUR (20 FT INTERVAL)

**FIGURE 5-3**  
Northern Area VOCs, SVOCs  
and DRO/GRO Concentrations



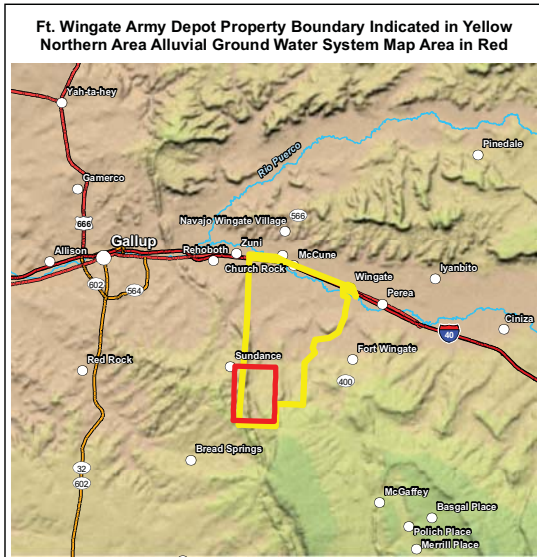
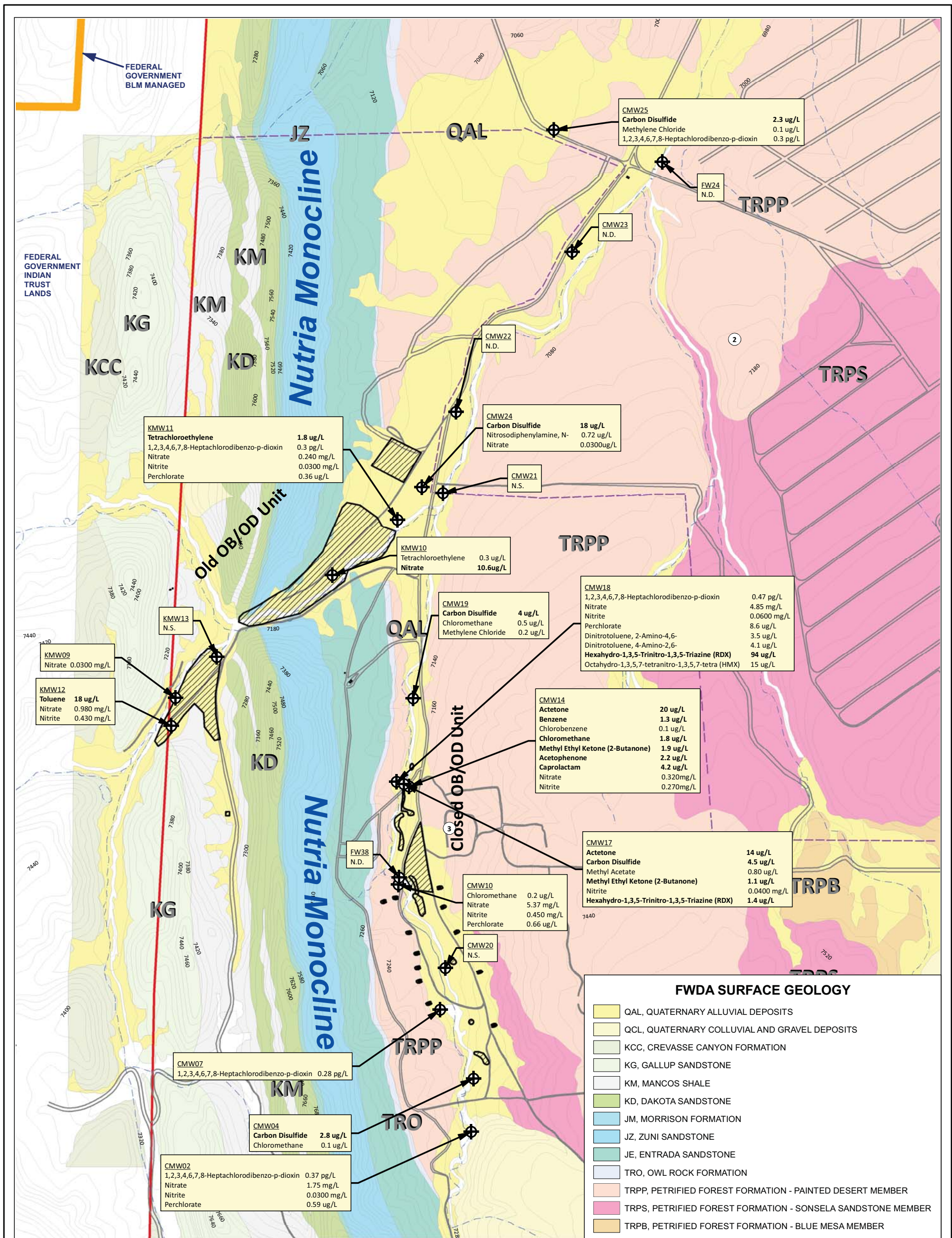
State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.  
Map Scale 1:12,000 (1"=1000')  
Map Date: June 4, 2010

Units: ug/L, micrograms per liter.  
N.D., not detected; N.S., not sampled.

Data sources: drainages, railroad, roads: Tele Atlas GDT-Dyn amap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

Prepared by: Tom Mc Tighe  
Reviewed by: David Henry





**FIGURE 5-4**  
**OB/OD Area Explosives**  
**Perchlorate, Nitrate/Nitrite,**  
**VOCs & SVOC Concentrations**

0.25 Miles  
0.25 Kilometers

State Plane Coordinate System, New Mexico West, North American Datum 1983.  
Units in US Survey Feet above Mean Sea Level.

Map Scale: 1:12,000 (1"=1000')  
Map Date: June 4, 2010

Units: mg/L, milligrams per liter; ug/L, micrograms per liter.  
N.D., not detected; N.S., not sampled.

Data sources: drainages, railroad, roads: Tele Atlas GDT-Dynamap, 2008; populated places: USGS, ESRI, 2005; orthophotography: USGS, 2005; Ft. Wingate Environmental Restoration detail: USACE.

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Reviewed by: David Henry

**US Army Corps of Engineers**  
Albuquerque District

## **6.0 SUMMARY OF GROUND-WATER MONITORING AND SAMPLING ACTIVITY**

The DTW was measured in monitoring wells in October 2009 and January 2010. In the northern portion of the installation, the ground water in the alluvium appeared to converge towards the Administration Area from the east, north, and south and flow west from the Administration Area. The ground water in the bedrock in the northern portion of the installation appeared to flow west. Ground-water elevation measurements taken in the OB/OD Area indicated a general northern gradient that roughly followed the topography.

USACE collected ground-water samples during October 2009 from all monitoring wells that yielded sufficient ground-water volume and/or discharge. Ground-water samples were not collected from those wells that were dry or nearly dry. Nitrate, VOCs, SVOCs, RDX, perchlorate, and metals were detected above regulatory health standards in the northern portion of the installation. Other constituents were detected but measured below regulatory health standards.

Nitrate, RDX, and metals were detected above regulatory limits in the OB/OD Area. Other constituents were detected but measured below regulatory health standards. No isoconcentration maps could be constructed for the OB/OD Area.

## **7.0 RECOMMENDATIONS**

Monitoring wells CMW20 and CMW21 can no longer be used for collecting groundwater samples. Flooding during the summer of 2009 buried CMW21 beneath sediment. This monitoring well should be abandoned while its location is still known. Flooding has damaged CMW20. The well is not completely buried; however, the casing has been damaged and is no longer accessible. Abandonment of these wells will be problematic because their location is within the Improvised Conventional Munitions (ICM) waiver area, Parcel 3. Therefore, USACE proposes to abandon these monitoring wells during the execution of the OB/OD unit closure.

This report documents four consecutive sampling events over a two-year period (Tables 5-9 through 5-15). USACE proposes to modify the sampling plan based on the results over this two-year period. Appendix F contains a proposed sampling plan based on non-detected constituents for four sampling events over a two-year period. If, for example, ground-water samples were collected for analyses for dioxins/furans from a particular monitoring well for four consecutive events, and results have repeatedly been non-detect for any dioxin or furans, USACE proposes to remove that sample collection requirement for that monitoring well. Tables 5-9 through 5-15 document all detected constituents recorded in the past two years, except for metals. The sampling plan modification does not apply to metals.

## **8.0 REFERENCES**

NMED, 2001. Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring. New Mexico Environment Department, October 30, 2001.

NMED, 2003. General Reporting Requirements for Routine Groundwater Monitoring at RCRA Sites. New Mexico Environment Department, February 14, 2003.

NMED, 2005. Resource Conservation and Recovery Act permit, EPA ID No. NM 6213820974. New Mexico Environment Department Hazardous Waste Bureau, December 1, 2005.

NMED, 2009. Tammy Diaz "Proposed Groundwater Sample Collection", Email to David Henry, September 23, 2009.

NMT, 2003. Geology of Fort Wingate Quadrangle, McKinley County, New Mexico, Orin J. Anderson, Charles H. Maxwell, and Spencer G. Lucas, New Mexico Institute of Mining and Technology, Socorro, New Mexico, September 2003.

PMC, 1999. Final Open Burning/Open Detonation Area RCRA Interim Status Closure Plan Phase IB - Characterization and Assessment of Site Conditions for the Ground Water Matrix, FWDA, Gallup, New Mexico.

TPMC, 2006. March 2006 Supplemental Ground Water Investigation – Administration and TNT Leaching Beds Areas, FWDA, Gallup New Mexico.

TPMC, 2008. March 2008 Interim Facility-Wide Ground Water Monitoring Plan, FWDA, Gallup, New Mexico.

USACE, 2008. April 2008 Fort Wingate Depot Activity Facility-Wide Ground Water Periodic Monitoring Report. U.S. Army Corps of Engineers, Albuquerque, New Mexico.

USGS, 2010. Andrew Robertson "USGS Fort Wingate Depot Activity, January 2010 Piezometer Transducer Measurements, Email to David Henry, May 19, 2010.