FORT WINGATE DEPOT ACTIVITY
GALLUP, NEW MEXICO

SUPPLEMENTAL GROUND WATER INVESTIGATION – ADMINISTRATION AND TNT LEACHING BEDS AREAS

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LIST OF ACRONYMS

12DCA	1,2-dichloroethane
13DNB	1,3-dinitrobenzene
24DNT	2,4-dinitrotoluene
24DANT	2,4-diamino-6-nitrotoluene
26DNT	2,6-dinitrotoluene
26DANT	2,6-diamino-4-nitrotoluene
2ADNT	2-amino-4,6-dinitrotoluene
2NT	2-nitrotoluene
3NT	3-nitrotoluene
4ADNT	4-amino-2,6-dinitrotoluene
4NT	4-nitrotoluene
ACP	asbestos concrete pipe
AOC	area of concern
ASTM	American Society for Testing and Materials
BCT	BRAC Cleanup Team
bgs	below ground surface
BIA	Bureau of Indian Affairs
BRAC	Base Realignment and Closure
CD	Compact Disc
CEC	Cation Exchange Capacity
CLP	Contract Laboratory Program
COR	Contracting Officer’s Representative
CY	Calendar Year
DBD	Dry Bulk Density
DNX	hexahydro-3-dinitroso-5-dinitro-1,3,5-triazine
DO	Dissolved Oxygen
DOI	Department of Interior
EDD	Electronic Data Deliverable
Eh	oxidation-reduction potential
EI	Environmental Investigation
°F	Degrees Fahrenheit
FSP	Field Sampling Plan
FWDA	Fort Wingate Depot Activity
GIS	Geographical Information System
HASP	Health and Safety Plan
HMX	cyclotetramethylenetetranitramine
HSA	Hollow Stem Auger

LIST OF ACRONYMS (CONTINUED)

HWB	Hazardous Waste Bureau
IDW	Investigation-Derived Waste
MDA	Missile Defense Agency
MNX	hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine
mph	miles per hour
MSC	Medium Specific Concentration
MTBE	methyl-t-butyl ether
NB	nitrobenzene
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
NTUA	Navajo Tribal Utility Authority
OB/OD	Open Burning/Open Detonation
PPE	Personal Protective Equipment
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QCSR	Quality Control Summary Report
RA	Release Assessment
RCRA	Resource Conservation and Recovery Act
RDX	Cyclotrimethylenetrinitramine
RFI	RCRA Facility Investigation
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCA	1,1,1-trichloroethane
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TEAD	Tooele Army Depot
TNB	1,3,5-trinitrobenzene
TNT	2,4,6-trinitrotoluene
TOC	total organic carbon
TPMC	TerranearPMC, LLC
ug/l	micrograms per liter
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOCs	Volatile Organic Compounds
WP	Work Plan

1.0 INTRODUCTION

This deliverable, the Administration and TNT Leaching Beds Areas Supplemental Ground Water Characterization Report, describes ground water investigation and characterization work performed during calendar years (CYs) 2002 and 2003 at the Administration and TNT Leaching Beds Areas located at Fort Wingate Depot Activity (FWDA), Gallup, New Mexico. The work elements described within this document were conducted by TerranearPMC, LLC (TPMC) (formerly PMC Environmental) of Exton, Pennsylvania. This document ins being prepared to fulfill requirements of Delivery Order No. 0006 under contract DACA63-01-D-0007. Contracting Officer's Representative (COR) and technical oversight responsibilities for the tasks described in this document were provided by the U.S. Army Corps of Engineers (USACE), Fort Worth District.

FWDA had delayed submission of this report pending the issuance of a Resource Conservation and Recovery Act (RCRA) Post-Closure Permit for the Open Burning/Open Detonation (OB/OD) Area at FWDA. The Permit, when finalized, will address RCnRA Corrective Action requirements for the solid waste management units (SWMUs) and areas of concern (AOCs) at FWDA. It was anticipated that the information provided herein would be incorporated into RCRA Facility Investigation (RFI) work plans for FWDA, and that the corrective action requirements will be used to assess the data collected during the field efforts described in this report. The Permit was issued in Draft form in September 2004, and the public comment period was extended until February 2005. A series of meetings and conference calls regarding the September 2004 draft permit were held between April 2005 and August 2005, with NMED, the Army, and other stakeholders working to resolve issues (including the number of sites requiring investigation and/or restoration) regarding the draft permit. These negotiations resulted in a new draft permit, issued 29 August 2005. The public comment period for this draft permit ended 28 October 2005. Currently the Permit is under final review for scheduled issuance during CY 2006.

However, on 5 November 2004, the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) sent a Request for Information to FWDA, which requested information including "a copy of all reports, documents, and analytical results associated with the implementation of any part of the May 21, 2002, Final Work Plan, Ground Water Characterization, Administration and TNT Leaching Beds Areas." Therefore, FWDA decided to finalize this report to present the data collected, without extensive data evaluation or risk assessment. FWDA assumes that data evaluation and/or risk assessment utilizing the data presented herein will be part of a future submittal responding to the specific corrective action requirements for the SWMUs and AOCs within the areas investigated.

1.1 PURPOSE/OBJECTIVE

The purpose of the work described in this report was to gather additional information to address comments and discussions by members of the FWDA

Base Realignment and Closure (BRAC) Cleanup Team (BCT) regarding information presented in the ***Final RCRA Facility Investigation Report for the TNT Leaching Beds Area*** (PMC, 2001b), hereinafter referred to as the TNT Beds RFI Report.

Discussions with the FWDA BCT regarding the conceptual hydrogeologic model of the Administration and TNT Leaching Beds Areas presented in the TNT Beds RFI Report indicated that the possibility existed that the downgradient flow of ground water from the TNT Leaching Beds Area to the north could be split by the influence of a ground water mound that has been shown to exist within the Administration Area. In this scenario, impacted ground water could flow to the west-northwest and/or to the northeast around the Administration Area, and existing downgradient monitoring wells TMW06 and TMW07 would not be properly placed to define the downgradient extent(s) of the impacted ground water. Therefore, additional monitoring wells were required to evaluate this scenario.

In addition, the ground water chemical data presented in the TNT Beds RFI Report indicated that the leading edge of impacted ground water (as indicated principally by detected nitrite/nitrate concentrations) had reached the edge of the permeable sediments of the Rio Puerco valley. Because these sediments are used for domestic water supply in the immediate vicinity of FWDA, additional efforts (monitoring wells and ground water samples) were warranted to determine the current ground water quality within the Rio Puerco sediments in the northern areas of FWDA.

The specific objectives of the characterization effort in and around the Administration and TNT Leaching Beds Areas were to:

- further identify the lateral extent of explosive compounds in ground water in the first unconsolidated water-bearing zone emanating from the TNT Leaching Beds,

- further identify the lateral extent of elevated nitrate/nitrite in ground water in the first unconsolidated water-bearing zone emanating from the TNT Leaching Beds,

- confirm the presence/absence of a chlorinated solvent plume in the Administration Area, and

- install a monitoring well located upgradient of the Administration and TNT Leaching Beds Areas to determine background ground water quality within the permeable sediments of the Rio Puerco Valley.

This Report was prepared as a component of the FWDA Environmental Investigation (EI) Program. Associated documents that address field implementation issues incorporated by reference include the following:

- Work Plan (WP) for the Ground Water Characterization of the Administration and TNT Leaching Beds Areas, FWDA, Gallup, New Mexico (PMC, 2002a);
- Final Low Flow Ground Water Sampling Procedures Addendum to the Final Field Sampling Plan, FWDA, Gallup, New Mexico (PMC, 2001a);
- Final Health and Safety Plan (HASP), FWDA, Gallup, New Mexico (PMC, 1998a);
- Final Field Sampling Plan (FSP), FWDA, Gallup, New Mexico (PMC, 1998b); and
- Final Quality Assurance Project Plan (QAPP), FWDA, Gallup, New Mexico (PMC, 1998c).

1.2 REPORT ORGANIZATION

This report is a one-volume document consisting of seven sections and five supporting appendices. A brief summation of each report section and appendix is detailed below.

2.0 OVERVIEW

2.1 SITE HISTORY

FWDA is an inactive U.S. Army depot whose former mission was to receive, store and ship material and to dispose of obsolete or deteriorated explosives and military munitions. Since 1975, the installation has been under the administrative command of the Tooele Army Depot (TEAD), located near Salt Lake City, Utah. 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 northwestern New Mexico, in McKinley County. The installation is located 8 miles east of Gallup on U.S. Route 66 and approximately 130 miles west of Albuquerque on Interstate 40 (Figure 1). FWDA contains facilities formerly used to operate a reserve storage activity providing for the care, preservation, and minor maintenance of assigned commodities, primarily conventional military munitions. The installation 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.

The installation is almost entirely 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 are Bureau of Indian Affairs (BIA) administered lands. Development north of FWDA includes 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. The town of Fort Wingate, located immediately to the east of FWDA on BIA administered land, was the original Fort Wingate headquarters site. To the south and southeast is the largely undeveloped Cibonse (Figure 2). These major land-use areas include:

- The Administration Area - located in the northern portion of the installation and encompassing approximately 800 acres; contains former office facilities, housing, equipment maintenance facilities, warehouse buildings, and utility support facilities;

- The Workshop Area - located south of the Administration Area and encompassing approximately 700 acres; consisting of an industrial area containing former ammunition maintenance and renovation facilities, the former TNT washout facility, and the TNT Leaching Beds Area;

- The Magazine (Igloo) Area - covering approximately 7,400 acres in the central portion of the installation and encompassing ten Igloo Blocks (A through H, J and K) consisting of 732 earth-covered igloos and 241 earthen revetments previously used for storage of munitions;

- Protection and Buffer Areas - encompassing approximately 4,050 acres consisting of buffer zones surrounding the former magazine and demolition areas; these areas are located adjacent to the eastern, northern, and western boundaries of the installation; and

- The OB/OD Area - located within the west central portion of the installation and encompassing approximately 1,800 acres; the OB/OD Area can be separated into two subareas based on period of operation, the Closed OB/OD Area and the Current OB/OD Area.

FWDA has been undergoing final environmental restoration prior to property transfer/reuse. As part of planned property transfer to the U.S. Department of Interior (DOI), the installation has been divided into reuse parcels (Figure 2) and transfer priorities and schedules have been proposed. Parcels transferred to date include Parcels 1, 15, and 17.

The Administration Area is located in Parcel 11, and the TNT Leaching Beds Area is located in Parcel 21.

2.2 ENVIRONMENTAL SETTING

2.2.1 Climate

Northwestern New Mexico is characterized by a semiarid continental climate. Most precipitation occurs from May through October as localized and brief summer storms. Spring and fall droughts characterize the area.

Mean annual rainfall for the area ranges between 10 and 16 inches, while the recorded average annual precipitation for FWDA is 11 inches. Depending on local elevations, mean annual rainfall fluctuates between 8 and 20 inches. Most of the precipitation occurs as rain or hail in summer thunderstorms, and the remainder results from light winter snow accumulations (M&E, 1992).

The average seasonal temperatures for the area vary with elevation and topographic features. During winter, daily temperatures fluctuate as much as 50 to 70 degrees Fahrenheit (°F) in a 24-hour period. In summer, daily high temperatures are between 85°F and 95°F (M&E, 1992). Average temperatures in winter are about 27°F and in summer 70°F, while extreme temperatures are as low as -30°F in winter and as high as 100°F in summer. There are 100 to 150 frost-free days during the year from the middle of May to the middle of October (M&E, 1992).

The area has generally sunny weather, with the sun shining more than 3000 hours annually. Average relative humidity varies from 50 to 15 percent, during the wet season (fall) and the dry season (spring), respectively (M&E, 1992). During spring, the area experiences strong winds from the west and southwest, with an average wind speed of 12 miles per hour (mph). Strong wind, high temperature, and low relative humidity in the area contribute to high evaporation rates (M&E, 1992).

2.2.2 Geology of the Administration and TNT Leaching Beds Areas

In CY 1997, geologic mapping of portions of FWDA and a fracture trace analysis were conducted by the U.S. Geological Survey (USGS) located in Flagstaff, Arizona. Geologic units exposed at the ground surface throughout much of FWDA were identified. Results of this identification, combined with information from geologic literature, are presented below to provide a detailed description of the geologic and stratigraphic setting of the Administration and TNT Leaching Beds Areas.

2.2.2.1 Geologic Summary

FWDA is underlain primarily by Triassic mudstone and sandstone layers that are tilted gently to the northwest. In the western and southern portions of the installation; however, Jurassic and Cretaceous sandstone and claystone layers are exposed along the Nutria Monocline (the Hogback), which is a steeply west dipping, north trending monoclinal fold.

2.2.2.2 Stratigraphy

Recent alluvial sediments cover much of the land area in the Administration and TNT Leaching Beds Area. These sediments consist predominately of silts and clays, with discontinuous bodies of sand and occasionally gravel. To the north of the developed portion of the Administration Area, the near surface sediments are dominated by the substantially more sandy riverine deposits associated with the Rio Puerco.

The alluvial/riverine deposits of the area of investigation are underlain by the Triassic Petrified Forest Formation, which comprises greater than 75 percent of the bedrock exposed at the surface throughout FWDA (Figures 3 and 4). The Petrified Forest Formation consists primarily of mudstone, claystone, and minor amounts of muddy sandstone. A middle member consisting of a relatively thick, continuous sandstone layer (Sonsela Sandstone Member) separates the upper and lower members.

The Painted Desert Member is the upper member of the Petrified Forest Formation. This member consists of mudstone, siltstone, sandy-mudstone, and lenticular sandstone layers. Sandstone lenses within the Painted Desert Member are thin (generally less than 20 feet thick), laterally discontinuous, and contain high quantities of very fine, muddy matrix. As a result, the apparent permeability of these lenses, and the Painted Desert Member as a whole, is very low. The Painted Desert Member is exposed at the ground surface on the areas of higher ground surface elevations located east, south, and southwest of the Administration and TNT Leaching Beds Areas (Figure 3).

The Sonsela Sandstone Member (middle member of the Petrified Forest Formation) is of variable thickness (20 to 80 feet thick) and is laterally continuous. This unit is a clean, well-sorted, quartzose sandstone that contains very small amounts of matrix and therefore has a high apparent permeability.

Below the Sonsela Sandstone Member is the lower member of the Petrified Forest Formation, the Blue Mesa Member. The lithology and apparent permeability of the Blue Mesa Member is similar to that of the Painted Desert Member.

The Moenkopi Formation, the San Andres Limestone, and the Glorieta Sandstone underlie the Blue Mesa Member. The lower Petrified Forest Formation and the Moenkopi Formation consist of 250 to 300 feet of mudstones and sandstones with a relatively low apparent permeability. Below this is approximately 100 feet of the San Andres Limestone underlain by approximately 120 feet of the Glorieta Sandstone.

Younger Jurassic and Cretaceous sandstone and claystone layers have been eroded in the TNT Leaching Beds Area. These units are exposed from the Hogback to the western FWDA boundary. The Jurassic Entrada Sandstone, Zuni Sandstone, and Morrison Formation account for approximately 1,200 feet of section and consist of massive, cross-bedded sandstones with a high apparent permeability. Above these units is a series of Cretaceous claystones and sandstones including the Dakota Sandstone (approximately 200 feet thick), the Mancos Claystone (approximately 600 feet thick), and the Gallup Sandstone (approximately 200 feet thick).

2.2.2.3 Structural Geology

Bedrock underlying the majority of FWDA dips gently to the northwest at an angle of approximately 5 degrees. The structural orientation of the bedrock has a substantial effect upon the movement of ground water. Area-wide ground water flow generally follows the structural dip (i.e., to the north-northwest).

2.3 ADMINISTRATION AREA

Prior to the efforts described in this report, a number of ground water monitoring wells had been installed in and around the Administration Area (Figure 5) as part of the FWDA EI Program. Results of previous efforts have been reported in various documents. Many of these existing monitoring wells were re-sampled as part of the effort described in this report, and those data are reported herein.

2.4 TNT LEACHING BEDS AREA

A series of field investigations were conducted in the area of the TNT Leaching Beds (Figure 5) from CY 1992 to CY 2001. The objectives of these investigations were to characterize the hydrogeologic setting and potential impacts to the environment caused by the former washout operations, identify potential migration paths and receptors, and identify remedial options for the impacted media.

Previous investigations are discussed in more detail in the TNT Leaching Beds RFI Report (PMC, 2001b) and the ***Phase I RCRA Facility Investigation Report, Buildings 542 and 600 Areas*** (PMC, 2002b)***.***

The U.S. Environmental Protection Agency (USEPA) provided comments on the TNT Leaching Beds RFI Report in a letter dated 19 April 2002. As discussed in Section 1.1, these comments and subsequent BCT discussions were used to plan the efforts described in this report.

Discussions during subsequent BCT meetings provided additional investigation direction with respect to the USEPA comments. The investigation work plans were completed and mutually agreed upon by the members of the BCT.

3.0 GROUND WATER INVESTIGATION

As summarized in Table 1, field investigation of the Administration and TNT Leaching Beds Areas in CYs 2002 and 2003 consisted of the drilling and sampling of soil borings, installation of monitoring wells, slug testing of newly-installed monitoring wells, ground water sampling, and a ground water elevation survey. Each of these activities is described in detail in the following sections.

3.1 SOIL BORING AND MONITORING WELL INSTALLATION

In order to satisfy the characterization program objectives outlined in Section 1.1, eight monitoring well locations were proposed in the 6 December 2001 BCT meeting. Based upon discussions held during this meeting and follow-on discussions during the March and June 2002 BCT meetings, some monitoring well locations were shifted to more effectively monitor localized ground water flow regimes and potential contamination migration pathways (Figure 5). A ninth monitoring well was also added to the program to determine ground water quality in the Rio Puerco Valley sediments prior to flow through the northern limit of the Administration Area. As described in the Work Plan (PMC, 2002a) each of the proposed new monitoring wells was screened within the first unconsolidated water-bearing zone.

In order to determine proper vertical placement of each well screen, exploratory soil borings were completed at each location. The borings were used to identify: geologic materials in the subsurface; the depth ground water was encountered; thickness of any water-bearing zone encountered; and the depth to the first significant confining layer or bedrock unit underlying the first unconsolidated water-bearing zone. Hollow-stem auger (HSA) drilling and split-barrel sampling methodologies were used to advance each of the boreholes. Each borehole was drilled to the point where bedrock and/or sampler refusal was encountered except TMW29, which was drilled to first water only. Soil cores were retrieved via continuous sampling methods during drilling of each boring, and detailed lithologic logs were prepared, as described in the FSP (PMC, 1998b).

A single soil sample was collected from the screened interval of each boring during well installation. These soil samples were analyzed for particle grain size via sieve and hydrometer analysis (American Society for Testing and Materials [ASTM] Method D 422-63), dry bulk density (ASTM Method D 2937), porosity (by calculation), total organic carbon (USEPA modified Method 415.1), and cation exchange capacity (USEPA Method SW-846 9081) to assist in determining contaminant transport properties of the water-bearing zone.

All exploratory boreholes completed as monitoring wells were drilled to bedrock and/or auger refusal except TMW29, which was drilled to first water only. All monitoring wells were screened within the first unconsolidated water-bearing zone (Figure 5). Monitoring well installation rationale is presented in Table 2. Monitoring well completion and subsequent development activities were performed following the methods outlined in the FSP (PMC, 1998b).

3.2 SLUG TESTING

Falling and rising head slug tests were performed at each of the newly-installed monitoring wells. These aquifer tests provide an estimate of the hydrogeologic properties of the water-bearing zone immediately surrounding the screened interval of the well. Several aquifer test data sets of previously installed wells were re-analyzed to insure consistency and to more accurately depict the properties of the water-bearing zones within the northern portion of FWDA. Slug test data sets were analyzed using AQTESOLV 3.1 Software (Hydrosolv, 1998). The methodology used for the analysis of each slug test data set was determined from well specific construction data and aquifer characteristics interpreted from drilling logs.

3.3 INSTALLATION-WIDE GROUND WATER ELEVATION SURVEY

Ground water elevation surveys were conducted during CYs 2002 and 2003 ground water sampling events. As part of this effort, ground water level measurements were collected in October 2002 and April 2003 from all of the monitoring wells located near the TNT Leaching Beds, within the Administration and Workshop Areas, and in the northern portion of FWDA. Contemporaneous sets of water levels were collected during different seasons to facilitate the evaluation of potential seasonal changes in ground water levels and flow direction.

3.4 GROUND WATER SAMPLING

3.4.1 Sampling Locations and Analytical Parameters

Twenty-six existing monitoring wells, the nine newly installed monitoring wells, three FWDA northern boundary wells (Wingate89, Wingate90, and Wingate91), and two off-site water supply wells (Navajo Tribal Utility Authority [NTUA] Well No. 16T-602 [SUPPLYWELL 54] and NTUA Well No. 16T-538UNC [SUPPLYWELL 55]) were sampled in October 2002. These wells were sampled for all or a subset of constituents that included total explosive compounds (expanded list), Target Compound List (TCL) volatile organic compounds (VOCs), TCL pesticides, Target Analyte List (TAL) total and dissolved metals, nitrate/nitrite non-specific, total nitrate, and perchlorate. Table 1 lists the constituents sampled for each well during the October 2002 ground water sampling event.

In April 2003, the same wells were again sampled with the exceptions of Wingate90 and the two off-site water supply wells (SUPPLYWELL 54/NTUA T16-602 and SUPPLYWELL 55/NTUA T16-538UNC), which were not sampled. Well Wingate90 had been determined to be in poor condition and not suitable for continued sampling; access to the NTUA wells was not granted for the April 2003 sampling effort. The ground water samples collected from the wells during April 2003 were analyzed for all or a subset of constituents that included total explosive compounds (expanded list), TCL VOCs, TCL pesticides, TAL total and dissolved metals, nitrate/nitrite non-specific, total nitrate, and perchlorate. Table

1 lists the constituents sampled for each well during the April 2003 ground water sampling event.

Monitoring well pre-sample purging was completed using a centrifugal pump, bladder pump, or bailer methodologies as determined by aquifer recharge rates and total well depth. Pre-sample purge water was collected and containerized for disposal at a permitted off-site facility. Samples were collected with bladder pumps or bailers after water quality parameter stabilization, the required purge volumes were evacuated from the well, or as directed by the USACE Technical Manager if the required purge volume was not obtained.

Field parameters were measured during purging and at the time of sampling. Field parameter measurements included dissolved oxygen (DO), oxidation-reduction potential (Eh), specific conductivity, pH, temperature, and turbidity.

In a few cases, there was insufficient water available from the well for all planned sample fractions and a reduced set of laboratory and/or field parameters were collected as directed by the USACE Technical Manager.

3.4.2 Laboratory Analysis and Data Validation

The methods used for analyzing the collected ground water samples are described in the FSP and QAPP (PMC, 1998b and 1998c). Quality assurance/quality control (QA/QC) samples were collected in accordance with the QAPP (PMC, 1998c) during the characterization efforts. An electronic data deliverable (EDD) in a format compatible with the existing FWDA data management system was produced by DataChem Laboratories.

Analytical laboratory data were validated in accordance with USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review (October 1999) and USEPA CLP National Functional Guidelines for Inorganic Data Review (February 1994), and the FWDA QAPP (PMC, 1998c). Ten percent of the data received full validation. One hundred percent of the data were validated with respect to blank contamination, field duplicate precision, and holding time compliance. Validation results are presented in the QCSR for the Administration and TNT Leaching Beds Areas (PMC, 2002 and 2003) in Appendix A.

3.5 INVESTIGATION-DERIVED WASTE

Five types of IDW were generated during the investigation activities at the Administration and TNT Leaching Beds Areas: soil cuttings, decontamination fluids, monitoring well development water, pre-sample purge water, and disposable sampling and personal protective equipment (PPE).

3.5.1 Soil IDW

Soil cuttings from monitoring well installations were placed in appropriately sized roll-off containers for off-site disposal. Waste disposal profiling was based on analytical results for composite samples collected from each roll-off container. Each roll-off container was sampled for explosive compounds, Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP semi-volatile organic compounds (SVOCs), TCLP metals, and ignitability.

3.5.2 Liquid IDW

Three types of liquid IDW were generated during the monitoring well installation and sampling events: decontamination fluids, monitoring well development water, and monitoring well pre-sample purge water. Decontamination of drilling equipment was conducted over a temporary decontamination structure lined with impervious material. During and at the completion of well installation activities, decontamination fluids were pumped from the decontamination structure into tanks. Development water and pre-sample purge water were collected from each well, transported to a central staging area, and placed in tanks. Each IDW tank was sampled for explosive compounds, RCRA VOCs, RCRA SVOCs, TCLP metals, and ignitability.

3.5.3 Other IDW Disposal

Disposable sampling equipment and PPE were decontaminated and placed into onsite municipal-refuse receptacles for disposal at an off-site facility.

3.6 MAPPING

Monitoring wells located in the Administration and TNT Leaching Beds Areas were installed during several events. These wells were surveyed at the completion of each well installation event, by different methods, and with significant periods between the survey events. The possibility existed for the wells to have been surveyed in different coordinate systems and to different elevation references, thereby giving inaccurate water level elevations and interpreted ground water flow directions for portions of the installation. The USACE Technical Manager directed TPMC to conduct an all-inclusive well survey of the Administration and TNT Leaching Beds Areas to provide accurate and up-to-date information for inclusion in the FWDA Geographical Information System (GIS). All monitoring wells in the Administration and TNT Leaching Beds Areas were resurveyed by a licensed surveyor in April 2003.

4.0 GROUNDWATER INVESTIGATION RESULTS

4.1 SOIL BORING AND MONITORING WELL INSTALLATION RESULTS

Soil boring logs, monitoring well construction diagrams, and well development forms for the borings and wells completed as part of the current investigation are presented in Appendix B. Monitoring well construction details are presented in Table 3. Monitoring well development data are presented in Table 4. A summary description of the subsurface materials encountered and findings derived from each boring are presented below.

4.1.1 TMW20

Borehole TMW20 was completed at a location cross-gradient (west) of the edge of the explosives and elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). TMW20 was completed as a boring only because no free water entered the borehole prior to auger refusal on bedrock at 70.3 feet below ground surface (bgs). A single saturated water-bearing zone was encountered from 56.4 to 57.2 feet bgs within the TMW20 borehole; however, because of the clay above and below the saturated material, the borehole walls were most likely smeared during drilling and the saturated zone was sealed off from the borehole. Borehole TMW20 was abandoned by grouting the boring to the ground surface with a cement-bentonite grout mixture. No soil samples were submitted for laboratory analysis from the TMW20 boring.

A second boring, TMW20A, was completed approximately 10 feet from the TMW20 boring in an attempt to locate the same saturated material encountered in TMW20. TMW20A was drilled to 60 feet bgs; however, no saturated materials were encountered. TMW20A was also completed as a boring only because of the absence of a water-bearing zone at this location. Boring TMW20A was abandoned by grouting the borehole to the ground surface with a cement-bentonite grout mixture. No soil samples were submitted for laboratory analysis from the TMW20A boring.

A third attempt (TMW29) was made to install a monitoring well in the general location of boreholes TMW20 and TMW20A. The results of this exploratory borehole are discussed in detail in Section 4.1.10.

4.1.2 TMW21

Borehole TMW21 was completed at a location cross-gradient (west) of the edge of the explosives and elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). First water was encountered at 48.0 feet bgs within saturated sand and silt deposits with some lesser silt and clay deposits. Auger refusal and competent bedrock were encountered at 72.0 feet bgs. Boring TMW21 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone. The first unconsolidated water bearing zone is approximately 19 feet thick at this location.

4.1.3 TMW22

Borehole TMW22 was completed at a location downgradient (northeast) of the edge of the explosives and elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). First water was encountered at 59.2 feet bgs, within alluvial deposits consisting of varying percentages of sand, silt, and clay. Auger refusal and competent bedrock were encountered at 77.0 feet bgs. Boring TMW22 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone. The first unconsolidated water-bearing zone is approximately 17.8 feet thick at this location.

4.1.4 TMW23

Borehole TMW23 was completed at a location downgradient (northeast) of the edge of the explosives and elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). First water was encountered at 46.4 feet bgs, within alluvial deposits consisting of varying percentages of sand, silt, and clay. Auger refusal and competent bedrock were encountered at 72.0 feet bgs. Boring TMW23 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone. The first unconsolidated water-bearing zone is approximately 25.6 feet thick at this location.

4.1.5 TMW24

Borehole TMW24 was completed at a location downgradient (northeast) of the elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). First water was encountered at 46.9 feet bgs, within alluvial deposits consisting of varying percentages of sand, silt, and clay. Auger refusal and competent bedrock were encountered at 75.0 feet bgs. Boring TMW24 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone, and to further evaluate the potential for contaminant migration to the northeast. The first unconsolidated water-bearing zone is approximately 28.1 feet thick at this location.

4.1.6 TMW25

Borehole TMW25 was completed at a location cross-gradient (west) of the elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). First water was encountered at 42.5 feet bgs, within saturated sand and silt deposits. Auger refusal and competent bedrock were encountered at 74.0 feet bgs. Boring TMW25 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone. The first unconsolidated water-bearing zone is approximately 31.5 feet thick at this location.

4.1.7 TMW26

Borehole TMW26 was completed at a location downgradient (north) of the elevated nitrate/nitrite contamination defined by the pre-2002 ground water monitoring network (Figure 5). First water was encountered at 42.5 feet bgs, within alluvial deposits consisting of varying percentages of sand, silt, and clay. Auger refusal and competent bedrock were encountered at 64.8 feet bgs. Boring TMW26 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone, and to further evaluate the potential for contaminant migration to the north. The first unconsolidated water-bearing zone is approximately 22.3 feet thick at this location.

4.1.8 TMW27

Borehole TMW27 was completed at a location downgradient (northwest) of the elevated nitrate/nitrite contamination defined by the existing ground water monitoring network (Figure 5). First water was encountered at 52.5 feet bgs, within alluvial deposits consisting of varying degrees of sand, silt, and clay. Auger refusal and competent bedrock were encountered at 102.2 feet bgs. Boring TMW27 was completed as a monitoring well to establish and monitor ground water quality conditions in the first unconsolidated water-bearing zone, and determine the presence/absence of off-site contaminant migration. The first unconsolidated water-bearing zone is approximately 49.7 feet thick at this location.

4.1.9 TMW28

Borehole TMW28 was completed at a location upgradient (east) of any known contamination defined by the pre-2002 ground water monitoring network (Figure 5). This monitoring well was completed in the Rio Puerco valley sediments to establish background ground water quality conditions in these deposits upgradient of any potential impacts from the TNT Leaching Beds and Administration Areas. First water was encountered at 27.0 feet bgs, within an alluvial deposit of alternating silty sand and silty clay layers. Auger refusal and competent bedrock were encountered at 72.5 feet bgs. The first unconsolidated water-bearing zone is approximately 45.5 feet thick at this location.

4.1.10 TMW29

Borehole TMW29 was completed in the general area of boreholes TWM20 and TMW20A to define the western edge of the explosives and elevated nitrate/nitrite contamination in ground water. TMW29 was located approximately 200 feet to the east of boreholes TMW20 and TMW20A (Figure 5). First water was encountered at 52.8 feet bgs, within a relatively thin layer of saturated sand and clay deposits.

As previously stated, TMW29 was drilled in a location near the TMW20 borehole. The boring log for TMW20 provided complete documentation of the subsurface materials in this area from the land surface to the top of competent bedrock. As a result, the boring for well TMW29 was completed only to the first water bearing zone and a well was constructed at this depth. Well TMW29 was placed to establish and monitor ground water quality in the first unconsolidated water-bearing zone. The first unconsolidated water-bearing zone is approximately 6.2 feet thick at this location.

4.1.11 Unconsolidated Material Thickness

Contour maps showing bedrock surface elevations (Figure 6) and thickness (isopach) of the unconsolidated materials (Figure 7) were developed using the pre-2002 data as well as the supplemental data generated by the 2002 drilling event. Figure 6 shows several north-trending ridges and troughs in the bedrock surface that appear to extend from surface rock outcrops in the southern portion of the Workshop Area to the Rio Puerco north of the Administration Area. Figure 7 indicates thickening of the unconsolidated materials with greater distance from the rock outcrops in the southern portion of the Workshop Area.

4.2 SLUG TESTING RESULTS

Slug tests were conducted at the newly constructed wells (TMW21, TMW22, TMW23, TMW24, TMW25, TMW26, TMW27, TMW28, and TMW29). Additionally, several previously slug tested wells (TMW06, TMW08, TMW10, and TMW11) were re-analyzed to insure consistency with the revised conceptual hydrogeologic model and aquifer test analysis techniques. Several analysis methods were used as determined by well construction characteristics and analytical method assumptions. Slug test results are summarized in Table 5. Copies of the hydraulic conductivity analyses are provided in Appendix C.

The values reported for TMW06, TMW08, TMW10, TMW11, TMW21, TMW23, TMW24, TMW25, TMW26, TMW27, TMW28, and TMW29 are similar to those expected for fine-grained sand and silt mixtures (Driscoll, 1986). The values reported for TMW22 are similar to those expected for silt and clay mixtures with minor sand (Driscoll, 1986).

4.3 GROUND WATER ELEVATION SURVEY RESULTS

Ground water elevation data were collected during the October 2002 and April 2003 ground water sampling events (Table 6). Potentiometric maps were produced from these data that indicate ground water flow within the first unconsolidated water-bearing zone in the northern portion of FWDA, including the TNT Leaching Beds Area, is generally toward the north-northwest. A ground water mound was confirmed to be present within the Administration Area.

Two ground water elevation scenarios were developed from the data collected during the sampling events. Scenario 1 (Figures 8 and 10) uses an areawide perspective and presents an anomalously high water level (at TMW26) and an anomalously low water level (at TMW25) as isolated points. Scenario 2 (Figures 9 and 11) attempts to merge the anomalous points into the areawide contours, resulting in areas of localized steep gradients. In either scenario, the relatively high ground water levels in the sediments of the Rio Puerco at well TMW28 suggest that hydrogeologic conditions within the sediments of the Rio Puerco represent a hydraulic barrier to the flow of ground water from the TNT Leaching Beds and Administration Areas to areas north of the FWDA boundary. The north-northwestern flow of ground water identified from the TNT Beds appears to be substantially diverted to the northwest-west, essentially merging with the westerly flow of ground water within the Rio Puerco sediments.

The October 2002 ground water potentiometric data are presented in Figures 8 and 9. The April 2003 ground water potentiometric data are presented in Figures 10 and 11 and closely resemble the data from October 2002.

4.3.1 Administration Area Ground Water Mound

Discussions with the FWDA BCT regarding the conceptual hydrogeologic model of the Administration and TNT Leaching Beds Areas presented in the TNT Beds RFI Report (PMC, 2001b) indicated that the possibility existed that the downgradient flow of ground water from the TNT Beds to the north could be split by the influence of a ground water mound that had been shown to exist within the Administration Area. In this scenario, impacted ground water could flow to the west-northwest and/or to the northeast around the Administration Area. As a potential consequence, existing downgradient monitoring wells TMW06 and TMW07 would not be properly placed to define the downgradient extent(s) of the impacted ground water. Therefore, additional monitoring wells were required to evaluate this scenario.

The origin of the ground water mound may be attributable to a number of factors. The natural soils within the Administration Area have been extensively reworked as part of building construction. This process typically results in the upper portions of the soil column being loosened. In addition, granular backfill (sand and/or gravel) is typically placed under the building slabs. The loosened soil and sand/gravel have substantially higher primary permeability than the natural soils; therefore, rainwater has an increased ability to infiltrate and percolate through these soils relative to undisturbed soils. In turn, this would result in the soils of the Administration Area having a greater ability to collect and retain shallow ground water.

An additional factor, and potentially a more significant factor, is the presence of substantial leaks within the water supply system in the Administration Area, and/or specifically associated with the in-ground 100,000 gallon water supply tank (i.e. the “cistern”) east of Building 34. As documented in the 1997 ***Water Line Investigation Report*** (Radian, 1997), most of the installation water lines are comprised of aging asbestos concrete pipe (ACP) or galvanized steel. From TPMC interviews with Mr. Duke Davis, former FWDA Caretaker, polyvinyl chloride (PVC) and cast iron pipe also exist at the facility. The findings of the report indicate the water supply lines at FWDA are in very poor condition, with some lines abandoned because of excessive water loss from leaks. According to Mr. Davis, the majority of the water lines feeding the Workshop Area (to the south of the Administration Area) had been shut off for some time because of leaks. Only two buildings (Buildings 528 and 536) in the Workshop Area still have water supplied to them that is only for fire suppression, which is supplied from the water tanks located northeast of the TNT Leaching Beds Area. Additionally, from conversations with Mr. Davis, it was indicated that leaks were so prominent in the Administration Area that occasionally the cistern would be empty. When the cistern is allowed to empty, it causes the 250,000 gallon tank northeast of the TNT Leaching Beds to also drain into the cistern and ultimately empty.

As mentioned previously, the current investigation was designed to evaluate if the north-northwest movement of explosives/nitrate-impacted ground water derived from the TNT Leaching Beds could be diverted to the northwest and/or northeast by the ground water mound. In this scenario, the pre-2002 monitoring well network may have been incomplete with regard to all possible downgradient contaminant transport directions. In order to address potential contaminant transport to the northwest, monitoring well TMW25 was installed to the west of the Administration Area. In addition, two attempts were made (borings TMW20 and TMW20A) to complete a monitoring well south of the Administration Area and west of the known explosives plume (as detected by the pre-2002 monitoring well network).

At both TMW20 and TMW20A, insufficient ground water was found in the unconsolidated sediments to support completion of a well, although thin zones of moisture were detected. Additionally, (See Section 4.1.11) a bedrock ridge that is evident above ground in the vicinity of Building 542 appears to extend underground from south to north, forming a subsurface restriction to ground water flow to the west in this area. In further support of this conclusion, the ground water elevation at well TMW25 is over 10 feet lower than at well TMW21, suggesting that well TMW25 is located within a different hydrogeologic setting than TMW21, and potentially cut off from the hydrogeologic setting within the TNT Leaching Beds area by the subsurface bedrock ridge.

Ground water transport to the northeast of the Administration Area is discussed in Section 4.5.

4.4 PHYSICAL SOIL TESTING RESULTS

A single soil sample was collected from the depth interval within each boring at which the well screen was to be placed. Soil samples were analyzed for particle grain size via sieve and hydrometer analyses, Dry Bulk Density (DBD), porosity, total organic carbon (TOC), and Cation Exchange Capacity (CEC) to assist in determining water-bearing zone properties and to characterize constituent fate and transport properties of the porous medium comprising the water-bearing zone.

Soil samples obtained for physical testing were collected using the split-barrel method (ASTM D 1586). This sampling method results in, by definition, a “disturbed” sample with respect to certain physical testing parameters; however, the reported results (Table 7) for testing parameters such as porosity were found generally to be consistent with the physical descriptions of the soils recorded on the boring logs. In addition, the range of hydraulic conductivity values determined by the slug test results (Section 4.2) is consistent with the particle grain size results.

4.5 UPDATED HYDROGEOLOGIC CONCEPTUAL MODEL

The hydrogeologic conceptual model developed for the TNT Leaching Beds area is described in detail in the TNT Beds RFI (PMC, 2001b). Data collected from the current investigation will be used to further support and refine that model. A summary of the model is presented in the following text.

<u>Unconsolidated Materials</u>

The unconsolidated materials consist of a series of interbedded silt, clay, and sand sediments ranging from near zero feet to almost 100 feet in thickness. These sediments form a wedge that increases in thickness from south to north through the TNT Leaching Beds and Administration Area study area. The thickest sediments are found near the Rio Puerco Valley. Claystone bedrock generally underlies the unconsolidated materials.

Two water-bearing zones were identified within the unconsolidated materials (first unconsolidated water-bearing zone and second unconsolidated water-bearing zone) in the area of investigation. In the central portion of the study area (i.e., in the area between the TNT Leaching Beds and the Administration Area), a clay layer exists between two thin, well-sorted sand deposits. Ground water was typically encountered in each of these sand deposits. However, the sand deposits and/or the clay layer are not universally present throughout the area of investigation. Where the clay layer is absent, only the first unconsolidated water-bearing zone is present. In locations where the sand deposits are not present, ground water typically is not present in the equivalent depth interval. Wells Wingate89, Wingate90, Wingate91, SUPPLYWELL 54 (NTUA 16T-602), and SUPPLYWELL 55 (NTUA 16T-538UNC) are screened in the Rio Puerco sediments and are considered undifferentiated because they have most likely been screened across both water bearing zones, if both unconsolidated zones exist at those locations.

Ground water in the unconsolidated sediments is derived from the infiltration and percolation of rain/snow-melt water that moves downward through these sediments until it reaches the relatively low permeability claystone bedrock. The ground water accumulates on the claystone surface and moves slowly downgradient along the erosional surface of the claystone (i.e., generally to the north and northwest). Additionally, data indicate that the Rio Puerco is a losing stream (Figures 8, 9, 10, and 11) that acts as a hydraulic barrier, inhibiting ground water movement from the TNT Leaching Beds and Administration Area to the north. Ground water levels in the Rio Puerco sediments appear to deflect the north-northwestern flow of ground water from FWDA to the west-northwest, eventually causing the FWDA-derived ground water to merge into the westerly flow of ground water in the Rio Puerco sediments.

Based upon pre-existing data and the new data generated during the current investigation, the unconsolidated sediments found within the Administration and TNT Leaching Beds Areas appear limited in extent to both the south and the east by bedrock outcrops (i.e. ridges) of low permeability claystone. In all cases, where boreholes were completed near these outcrops/subcrops, shallow ground water tended to pinch out. Additionally, south to north trending bedrock ridge subcrops (Figure 6) appear to limit the extent of shallow ground water to the west of the Administration Area.

Bedrock Materials

Within the predominately claystone bedrock underlying the area of investigation, discrete layers of sandstone have been identified. These sandstone layers are discussed in the following paragraphs.

The third water-bearing zone was identified in 4 borings at depths ranging from 79 to 106 feet bgs where it most often occurred in the first thin sandstone unit (first sandstone water-bearing zone) encountered within a thick interval of claystone. During the drilling process, the claystone was observed to be mostly dry, indicating that little vertical movement of water occurs under current conditions. Although moisture was detected in the sandstone unit at each of these 4 borings, free ground water was recorded in only one of these borings, at a location (monitoring well TMW02) immediately to the west of the TNT Leaching Beds. This sandstone unit was not identified in borings located in the southwest portion of the area of investigation. These data indicate that the first sandstone water-bearing zone is physically discontinuous to the southwest of the TNT Leaching Beds and does not contain quantities of ground water sufficient to recharge a well to the north, east and far south of the TNT Leaching Beds. “Ground water” in these areas exists only as moisture within the sandstone matrix.

A fourth water-bearing zone (second sandstone water-bearing zone) was identified in a lower sandstone unit in areas to the south, east, and west of the TNT Leaching Beds at depths ranging from 35 to 217 feet. This lower sandstone unit stratigraphically lies beneath the first sandstone water-bearing zone and represents the second sandstone water-bearing zone within the thick claystone interval underlying the study area. As noted above, the claystone is largely dry, suggesting that little vertical movement of water occurs under current rainfall conditions.

Both sandstone units outcrop, or subcrop beneath a thin layer of sediment and/or soil in areas to the south of the TNT Leaching Beds. These outcrop/subcrop locations represent areas in which direct recharge to the sandstone units is possible under current conditions.

Based on the information summarized above, cross sections of the area of investigation were developed and are presented in Figure 12.

5.0 CHEMICAL DATA ASSESSMENT

As discussed in Section 1.0, on 5 November 2004, NMED HWB sent a Request for Information to FWDA, which requested information including "a copy of all reports, documents, and analytical results associated with the implementation of any part of the May 21, 2002, Final Work Plan, Ground Water Characterization, Administration and TNT Leaching Beds Areas." Consequently, FWDA decided to finalize this report to present the data collected, without extensive data evaluation or risk assessment. The FWDA RCRA permit will require the development of detailed RFI Work Plans and/or Release Assessments (RA) on a parcel by parcel basis for each SWMU or AOC within a parcel. These work plans will thoroughly assess the available chemical data and propose and describe in detail the need for and type of any additional environmental characterization efforts required to support environmental restoration decisions.

Analytical data will be presented in this report. Although extensive data assessment and risk characterization will not be presented, chemical-specific environmental standards or other threshold values will be used to facilitate delineation of areas impacted by potential releases of waste materials that could be of concern to potential receptors. Mapping of chemical concentrations derived from the current investigation will be compared to that generated by the pre-2002 investigations.

Because it is common for environmental media to contain a suite of metals (associated with the mineral content of the soil and rock materials), a substantial quantity of metals data has been generated. The metals data generated by the current investigation will not be mapped, as mapping of these data, in conjunction with older data, will be conducted during the RFI work plan and/or RA stages of the RCRA Post Closure Permit compliance program.

5.1 GROUND WATER CHARACTERIZATION

Two ground water sampling events were conducted in the Administration and TNT Leaching Beds Areas during CYs 2002 and 2003. Sampling was conducted at monitoring wells in and around the Administration and TNT Leaching Beds Areas and two off-site water supply wells. Four separate water-bearing intervals have been identified in these areas, as follows: 1) first unconsolidated water-bearing zone, 2) second unconsolidated water-bearing zone, 3) first sandstone water-bearing zone, and 4) second sandstone water-bearing zone. Ground water analytical results are discussed by water-bearing zone, and specific wells within a water-bearing zone are discussed by area (see Figure 5) beginning with areas hydraulically upgradient (south), and progressing to areas hydraulically downgradient (north). Water quality data collected during pre-sample purging and field analytical results for each of the sampling events are presented by water-bearing zone at the end of the section.

5.1.1 First Unconsolidated Water-Bearing Zone

The majority of the Administration and TNT Leaching Beds Area monitoring wells are completed in the first unconsolidated water-bearing zone. These wells are located primarily to the north, south, and west of the TNT Leaching Beds. Additionally, Wingate89, Wingate90, and Wingate91 are included in this group even though they are considered undifferentiated unconsolidated water-bearing zone wells. These three wells are thought to be make-up water supply wells used during the construction of Interstate 40, and are completed in the uppermost portions of the Rio Puerco sediments.

Analytical data results from both the October 2002 and April 2003 sampling events are presented in Table 8. Field water quality parameters collected during pre-sample purging are presented in Table 9.

5.1.1.1 Explosive Compounds

Explosive compounds were detected in several monitoring wells in the first unconsolidated water-bearing zone. An expanded explosive compound analytical list was used to further characterize explosive compound breakdown products for use in a monitored natural attenuation remediation scenario. The results are discussed further in the following sections, and the results are illustrated as total explosives isoconcentration maps on Figures 13 and 14. The October 2002 and April 2003 data are show with green contour lines. The blue contour lines in these figures indicates the maximum extent of detected explosives compounds as identified by the pre-2002 investigation results.

Area 1 – Upgradient Areas

As part of previous investigations at the TNT Leaching Beds, a number of monitoring wells were constructed in areas to the south (upgradient) of the beds. However, the geologic setting limited the area in which a suitable well could be located. The first unconsolidated water-bearing zone, present in the subsurface below the TNT Leaching Beds, approaches the land surface and eventually pinches out to the south. As a result, a number of wells were completed along the southern edge of this water-bearing unit in an attempt to characterize the shallow ground water quality upgradient of the Leaching Beds.

<u>TMW01</u>

No explosive compounds were detected in the samples collected from TMW01 during either the October 2002 or the April 2003 sampling events.

<u>TMW11</u>

One explosive compound, cyclotrimethylenetrinitramine (RDX), was detected in the samples collected from TMW11 during both the October 2002 and the April 2003 sampling events (Table 8).

TMW15

No sample was submitted for explosive compounds analysis from TMW15 during the October 2002 sampling event.

No explosive compounds were detected in the sample collected from TMW15 during the April 2003 sampling event.

TMW13

No explosive compounds were detected in the samples collected from TMW13 during either the October 2002 or the April 2003 sampling events.

FW10

One explosive compound, the TNT manufacturing component 2,6-dinitrotoluene (26DNT), was detected in the sample collected from FW10 during the October 2002 sampling event (Table 8).

No explosive compounds were detected in the sample collected from FW10 during the April 2003 sampling event.

Area 1 Summary

The data for explosives from the October 2002 and April 2003 sampling efforts indicate that areas upgradient of the TNT Leaching Beds are, for the most part, unimpacted by the discharge of explosives-laden wastewaters at the TNT Leaching Beds. Well FW10, located immediately adjacent to the pre-1962 leaching beds, was impacted by only one explosive compound. Well TMW11, located to the southwest of the Leaching Beds, was found to contain RDX. However, wells TMW13 and TMW15, located between TMW11 and the Leaching Beds have not been impacted by explosives compounds, suggesting that the RDX detections at TMW11 are not related to the TNT Beds.

Area 2 – Central Area

Previous investigations at the TNT Leaching Beds have indicated that ground water in this area has been significantly impacted by the leaching beds. Data from the October 2002 and April 2003 sampling efforts confirm these observations.

TMW03

A total of 13 explosive compounds were detected in the sample collected from TMW03 during the October 2002 sampling event (Table 8). Three parent explosive compounds (2,4,6-trinitrotoluene [TNT], cyclotetramethylenetetranitramine [HMX], and RDX), two TNT manufacturing components (2,4-Dinitrotoluene [24DNT] and 4-nitrotoluene [4NT]), two TNT photodegradation products (1,3,5-Trinitrobenzene [TNB] and nitrobenzene [NB], and four TNT transformation products (2-Amino-4,6-dinitrotoluene [2ADNT], 4-

amino-dinitrotoluene [4ADNT], 2,4-Diamino-6-nitrotoluene [24DANT], and 2,6-Diamino-4-nitrotoluene [26DANT]) were detected. Two RDX transformation products (Hexahydro-3-dinitroso-5-dinitro-1,3,5-triazine [DNX] and Hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine [MNX]) were also detected in the October 2002 sample.

A total of 14 explosive compounds were detected in the sample collected from TMW03 during the April 2003 sampling event (Table 8). The detected explosives closely resemble and confirm the detections in the October 2002 sample. Two additional TNT manufacturing components (2-Nitrotoluene [2NT] and 3-Nitrotoluene [3NT]), and one additional TNT photodegradation product (1,3-Dintrobenzene [13DNB]) were detected in the April 2003 sample; however, neither of the previously identified RDX transformation products (DNX and MNX) were detected. A duplicate sample was collected in April 2003, and the duplicate sample results closely resemble and confirm detections in the parent sample.

<u>TMW04</u>

A total of 13 explosive compounds were detected in the samples collected from TMW04 during the October 2002 sampling event (Table 8). Three parent explosive compounds (TNT, HMX, and RDX), two TNT manufacturing components (24DNT and 4NT), two TNT photodegradation products (TNB and NB), and four TNT transformation products (2ADNT, 4ADNT, 24DANT, and 26DANT) were detected. Two RDX transformation products (DNX and MNX) were also detected.

A total of 13 explosive compounds were detected in the sample collected from TMW04 during the April 2003 sampling event (Table 8). The detected explosives closely resemble and confirm the detections in the October 2002 sample. Two additional TNT manufacturing components (2NT and 3NT), and one additional TNT photodegradation product (13DNB) were detected in the April 2003 sample; however, neither the previously identified HMX nor the previously identified RDX transformation products (DNX and MNX) were detected.

<u>TMW29</u>

No explosive compounds were detected in the samples collected from TMW29 during either the October 2002 or the April 2003 sampling events.

<u>TMW21</u>

One explosive compound, the RDX transformation product MNX, was detected in the sample collected from TMW21 during the October 2002 sampling event (Table 8).

No explosive compounds were detected or confirmed in the sample collected from TMW21 during the April 2003 sampling event.

TMW22

One explosive compound, the TNT transformation product 26DANT, was detected in the sample collected from TMW22 during the October 2002 sampling event (Table 8).

One explosive compound, RDX, was detected in the sample collected from TMW22 during the April 2003 sampling event (Table 8). The previously identified TNT transformation product, 26DANT was not detected or confirmed in the April 2003 sample.

TMW25

No explosive compounds were detected in the samples collected from TMW25 during either the October 2002 or the April 2003 sampling events.

Area 2 Summary

The general configuration of the central area of the explosives plume was confirmed by the current investigation. The western extent of the plume was found to be essentially the same as that identified by the pre-2002 investigations. The 2002/2003 data indicate that the eastern extent reaches farther to the east and northeast than previously identified.

Area 3 – Northern Area

Data from the pre-2002 investigations indicated that the explosives plume extended in a northerly direction as shown in Figures 13 and 14. This configuration was defined, in part, by chemical ground water samples obtained from pilot borings arranged in concentric arcs moving northward from the TNT Beds. Permanent monitoring wells were constructed on the east, west, northeast and northwest during the current investigation to provide updated delineation data.

TMW06

One explosive compound, the TNT transformation product 26DANT, was detected in the sample collected from TMW06 during the October 2002 sampling event (Table 8).

Two explosive compounds, RDX and the TNT manufacturing component 2NT, were detected in the sample collected from TMW06 during the April 2003 sampling event (Table 8). The previously identified TNT transformation product, 26DANT was not detected or confirmed in the April 2003 sample.

TMW08

No explosive compounds were detected in the samples collected from TMW08 during either the October 2002 or the April 2003 sampling events.

TMW23

A total of eight explosive compounds were detected in the sample collected from TMW23 during the October 2002 sampling event (Table 8). Two parent explosive compounds (TNT and RDX), two TNT manufacturing components (3NT and 4NT), one TNT photodegradation product (NB), and two TNT transformation products (24DANT and 26DANT) were detected in the sample. One RDX transformation product (DNX) was also detected in the October 2002 sample.

A total of nine explosive compounds were detected in the sample collected from TMW23 during the April 2003 sampling event (Table 8). The detected explosives closely resemble and confirm the detections in the October 2002 sample. One additional TNT manufacturing component (2NT) and one additional RDX transformation product (MNX) were detected in the April 2003 sample; however, the previously identified TNT manufacturing component (4NT) was not detected. A duplicate sample was collected in April 2003; the sample results closely resemble and confirm detections in the parent sample.

TMW24

No explosive compounds were detected in the samples collected from TMW24 during either the October 2002 or the April 2003 sampling events.

TWM10

No explosive compounds were detected in the samples collected from TMW10 during either the October 2002 or the April 2003 sampling events. No explosive compounds were detected in the duplicate sample collected in October 2002.

TMW26

No explosive compounds were detected in the samples collected from TMW26 during either the October 2002 or the April 2003 sampling events.

TMW27

No explosive compounds were detected in the samples collected from TMW27 during either the October 2002 or the April 2003 sampling events. No explosive compounds were detected in the duplicate sample collected in October 2002.

Area 3 Summary

The current investigation generally confirmed the limits of the explosives plume to the west as delineated by the pre-2002 investigations. The new data indicate that explosives impacts have migrated farther to the north-northeast (i.e., past wells TMW06, TMW22, and TMW23) than had previously been documented. This finding confirms the hypothesis that the ground water mound present in the Administration Area has an influence on the downgradient movement of the explosives plume, but only in the north-northeast direction. New well TMW24 and pre-2002 well TMW08 were found to be unimpacted; these wells define the current northern limit of the explosives impacts in the uppermost water-bearing zone.

Area 4 – Far Northern Area

FWDA has sampled a number of other wells found to be present in the northern portion of the installation or in areas immediately off-site to the north and northwest. Three wells (Wingate89, Wingate90, and Wingate91) were completed in support of the construction of I-40. Two water supply wells associated with the Navajo Tribal Utility Authority (NTUA 16T-602 and NTUA 16T-538UNC) were also sampled.

Well TMW28 was constructed as part of the current investigation to define the water quality of the ground water within the sediments of the Rio Puerco upstream of any potential influence of ground water from the TNT Beds/Administration Area.

Wingate89

No explosive compounds were detected in the samples collected from Wingate89 during either the October 2002 or the April 2003 sampling events.

Wingate90

No explosive compounds were detected in the sample collected from Wingate90 during the October 2002 sampling event. No explosive compounds were detected in the duplicate sample collected in October 2002.

No sample was submitted for explosive compounds analysis from Wingate90 during the April 2003 sampling event.

Wingate91

No explosive compounds were detected in the samples collected from Wingate91 during either the October 2002 or the April 2003 sampling events.

SUPPLYWELL 54 (NTUA 16T-602)

No explosive compounds were detected in the sample collected from SUPPLYWELL 54 during the October 2002 sampling events.

No sample was submitted for explosive compounds analysis from SUPPLYWELL 54 during the April 2003 sampling event.

SUPPLYWELL 55 (NTUA 16T-538UNC)

No explosive compounds were detected in the sample collected from SUPPLYWELL 55 during the October 2002 sampling events.

No sample was submitted for explosive compounds analysis from SUPPLYWELL 55 during the April 2003 sampling event.

TMW28

No explosive compounds were detected in the samples collected from TMW28 during either the October 2002 or the April 2003 sampling events.

Area 4 Summary

None of the wells in areas north and/or northwest of the Administration Area were found to have been impacted by explosives compounds.

5.1.1.2 Nitrate/Nitrite

Nitrate and/or nitrite were detected in several monitoring wells in the Administration and TNT Leaching Beds Areas. Because nitrite was detected at extremely low levels or undetected during previous sampling events, nitrate and nitrite were collected as a two-part sample: nitrate/nitrite-nonspecific and total nitrate. This sampling strategy was completed to obtain the lowest detectable and most realistic representative values for nitrite. Nitrite values were calculated from the difference of the nitrate/nitrite-nonspecific reported value and the total nitrate reported value.

The nitrate and nitrite results are discussed in detail in the following sections, and the results are illustrated as nitrate and nitrite isoconcentration maps in Figures 15 and 16 for nitrate and Figures 17 and 18 for nitrite.

Area 1 – Upgradient Areas

The pre-2002 investigations indicated that areas upgradient of the TNT Leaching Beds were not impacted by nitrate at concentrations greater than the New Mexico Water Quality Control Commission (NMWQCC) standard of 10,000 micrograms per liter (ug/l). Nitrite was detected at concentrations exceeding adjusted USEPA Region VI Medium Specific Concentration (MSC) of 1,000 ug/l at a single locations (TMW01). Detected concentrations at FW10 approached the NMWQCC standard for nitrate.

TMW01

Nitrate was detected in the samples collected from TMW01 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was detected at a concentration exceeding the MSC in the April 2003 sample but was not detected in the October 2002 sample (Table 8).

TMW11

Nitrate was detected in the samples collected from TMW11 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected during either of the sampling events.

TMW15

Nitrate was detected in the samples collected from TMW15 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected during either of the sampling events.

TMW13

Nitrate was detected in the samples collected from TMW13 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected during either of the sampling events.

FW10

Nitrate was detected in the sample collected from FW10 during the October 2002 sampling event (Table 8). Nitrite was not detected in the October 2002 sample.

No samples for nitrate or nitrite were collected from FW10 during the April 2003 sampling event because of insufficient sample volume.

Area 1 Summary

None of the wells in the upgradient areas were found to have nitrate concentrations greater than regulatory levels. As previous identified, nitrate concentrations at FW10 approached the NMWQCC standard and nitrite concentrations at TMW01 exceeded the MSC.

Area 2 – Central Area

The pre-2002 investigations indicated that elevated concentrations of nitrate and/or nitrite were present in the central portion of the area of investigation. Many of the detected concentrations in this area exceeded regulatory levels.

TMW03

Nitrate was detected in the samples collected from TMW03 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in the October 2002 sample but was detected in the April 2003 sample (Table 8). A duplicate sample was collected in April 2003; nitrate was detected but nitrite was not detected in this duplicate sample (Table 8).

TMW04

Nitrate was detected in the samples collected from TMW04 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was detected in the October 2002 sample but not in the April 2003 sample (Table 8).

TMW29

Nitrate and nitrite were both detected in the samples collected from TMW29 during the October 2002 and April 2003 sampling events (Table 8).

TMW21

Nitrate and nitrite were both detected in the samples collected from TMW21 during the October 2002 and April 2003 sampling events (Table 8).

TMW22

Nitrate and nitrite were both detected in the samples collected from TMW22 during the October 2002 and April 2003 sampling events (Table 8).

TMW25

Nitrate was detected in the samples collected from TMW25 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was detected in the October 2002 sample but not in the April 2003 sample (Table 8).

Area 2 Summary

The current investigation differentiated between nitrate and nitrite. The area impacted by these parameters was similar to that described by the pre-2002 investigations.

Detected concentrations of nitrate generated by the current investigation exceeded the NMWQCC standard at wells TMW03 and TMW04, located immediately to the north of the TNT Beds. Concentrations of nitrite exceeded the adjusted USEPA MSC at several wells in this area.

Area 3 – Northern Area

The pre-2002 investigations indicated that the northern-most extent of nitrate/nitrite concentrations greater than the applicable threshold values was located in the general vicinity of well TMW08 (nitrate in Figures 15 and 16; and nitrite in Figures 17 and 18). The northwestern extent was not defined, as concentrations at wells MW20 and MW22 were greater than the threshold values. In addition, nitrate/nitrite concentrations at the northeastern-most monitoring point (well MW08) were slightly greater than the threshold values.

Additional monitoring wells were constructed as part of the current investigation, and additional samples for nitrate and nitrite were collected from additional existing monitoring wells that had not previously been sampled for nitrate or nitrite.

MW18D

Nitrate and nitrite were not detected in the samples collected from MW18D during either the October 2002 or April 2003 sampling events. Nitrate and nitrite were also not detected in the duplicate sample collected in April 2003.

MW20

Nitrate was detected in the samples collected from MW20 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in the October 2002 sample; however, nitrite was detected in the April 2003 sample (Table 8).

MW22D

Nitrate and nitrite were detected in the samples collected from MW22D during both the October 2002 and April 2003 sampling events (Table 8). A duplicate sample was collected from MW22D in October 2002; the duplicate sample results closely resemble and confirm the detections in the parent sample.

MW22S

Nitrate was detected in the samples collected from MW22S during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in either the October 2002 or April 2003 samples.

MW-1

Nitrate was detected in the samples collected from MW-1 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in the October 2002 sample, but was detected in the April 2003 sample (Table 8).

MW-2

Nitrate was detected in the samples collected from MW-2 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in the October 2002 sample, but was detected in the April 2003 sample (Table 8).

MW-3

Nitrate was detected in the samples collected from MW-3 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in the October 2002 sample, but was detected in the April 2003 sample (Table 8).

TMW06

Nitrate and nitrite were both detected in the samples collected from TMW06 during the October 2002 and April 2003 sampling events (Table 8).

TMW08

Nitrate was detected in the samples collected from TMW08 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in either sample.

The detected nitrate concentrations were less than the NMWQCC standard in both samples.

TMW23

Nitrate was detected in the samples collected from TMW23 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in the October 2002 sample, but was detected in the April 2003 sample (Table 8). A duplicate sample was collected in April 2003; the duplicate sample results closely resemble and confirm the detections in the parent sample.

TMW24

Nitrate and nitrite were not detected in the samples collected from TMW24 during the October 2002 or April 2003 sampling events.

TWM10

Nitrate was detected in the samples collected from TMW10 during both the October 2002 and April 2003 sampling events (Table 8). Nitrite was not detected in either the October 2002 or April 2003 samples. A duplicate sample was collected in October 2002; the duplicate sample results closely resemble and confirm the detections in the parent sample. Nitrite was detected in the October 2002 duplicate sample; however, nitrite was not detected in the parent sample.

TMW26

Nitrate and nitrite were not detected in the samples collected from TMW26 during the October 2002 or April 2003 sampling events.

SMW01

Nitrate and nitrite were not detected in the samples collected from SMW01 during the October 2002 or April 2003 sampling events.

TMW27

Nitrate and nitrite were not detected in the samples collected from TWM27 during the October 2002 or April 2003 sampling events. A duplicate sample was collected in October 2002; nitrate and nitrite were not detected in this duplicate sample.

Area 3 Summary

The nitrate and nitrite concentrations identified by the current investigation generally confirm the data from the pre-2002 investigations. The extent of concentrations greater than the applicable threshold values was found to be farther to the northwest and northeast than previously identified. The northern-most extent of concentrations greater than the threshold values was confirmed to be the general area of wells MW08 and MW10. Nitrate concentrations in these wells were found be slightly lower than those noted in the pre-2002 investigations. The non-detect values identified at wells TMW24, TMW26, SMW01, and TMW27 provide a well defined northern limit to the extent of nitrate and nitrite impacts.

Area 4 – Far Northern Area

Wells Wingate89 and Wingate90 were the only wells situated in the Far Northern Area, as defined by this report, that had been sampled previously for nitrate/nitrite. Detectable levels of nitrate/nitrite were not identified by the pre-2002 investigations.

Wingate89

Nitrate and nitrite were not detected in the samples collected from Wingate89 during the October 2002 or April 2003 sampling events.

Wingate90

Nitrate and nitrite were not detected in the sample collected from Wingate90 during the October 2002 sampling event. A duplicate sample was collected from Wingate90 in October 2002. Nitrate and nitrite were not detected in this duplicate sample.

No samples were collected from Wingate90 during the April 2003 sampling event.

Wingate91

Nitrate and nitrite were not detected in the samples collected from Wingate91 during the October 2002 or April 2003 sampling events.

SUPPLYWELL 54 (NTUA 16T-602)

Nitrate and nitrite were not detected in the samples collected from SUPPLYWELL 54 during the October 2002 sampling event.

No samples were collected from SUPPLYWELL 54 during the April 2003 sampling event.

SUPPLYWELL 55* *(NTUA 16T-538UNC)

Nitrate was detected in the sample collected from SUPPLYWELL 55 during the October 2002 sampling event (Table 8). The detected concentration of nitrate was well below the NMWQCC standard.

Nitrite was not detected in the October 2002 sample.

No samples were collected from SUPPLYWELL 55 during the April 2003 sampling event.

TMW28

Nitrate and nitrite were not detected in the samples collected from TMW28 during the October 2002 or April 2003 sampling events.

Area 4 Summary

Data from the current investigation indicate that the shallow ground water in the Far Northern Area generally has not been impacted by nitrate or nitrite. The one detection of either parameter (nitrate at SUPPLYWELL 55/NTUA 16T-538UNC) was well below the NMWQCC standard. SUPPLYWELL 55/NTUA 16T-538UNC is downgradient (west) of FWDA and the other wells in this portion of the area of investigation, which are located upgradient of SUPPLYWELL 55/NTUA 16T-538UNC, were not found to contain detectable levels of nitrate or nitrite. Therefore, the nitrate detection at SUPPLYWELL 55/NTUA 16T-538UNC does not appear to be associated with activities at FWDA.

5.1.1.3 Perchlorate

Perchlorate was detected in several monitoring wells in the area of investigation. These results represent the first data set for perchlorate in ground water for this area of FWDA. The results are discussed further in the following sections, and the results are illustrated as perchlorate isoconcentration maps on Figures 19 and 20.

As noted in the figures, perchlorate was only detected in the wells (TMW01, TMW11, TMW13, and TMW15) located in areas upgradient of the TNT Leaching Beds. This strongly indicates that the TNT Beds are not a source of ground water contamination by perchlorate.

TMW01

Perchlorate was detected in the samples collected from TMW01 during both the October 2002 and April 2003 sampling events (Table 8).

TMW11

Perchlorate was detected in the sample collected from TMW11 during the October 2002 sampling event (Table 8), but was not detected in the April 2003 sample.

TMW15

Perchlorate was detected in the sample collected from TMW15 during the October 2002 sampling event (Table 8), but was not detected in the April 2003 sample.

TMW13

Perchlorate was detected in the sample collected from TMW13 during the October 2002 sampling event (Table 8), but was not detected in the April 2003.

FW10

Perchlorate was not detected in the samples collected from FW10 during the October 2002 and April 2003 sampling events.

TMW03

Perchlorate was not detected in the samples collected from TMW03 during the October 2002 and April 2003 sampling events. Perchlorate was also not detected in the duplicate sample collected in April 2003.

TMW04

Perchlorate was not detected in the samples collected from TMW04 during the October 2002 and April 2003 sampling events.

TMW29

Perchlorate was not detected in the samples collected from TMW29 during the October 2002 and April 2003 sampling events.

TMW21

Perchlorate was not detected in the samples collected from TMW21 during the October 2002 and April 2003 sampling events.

TMW22

Perchlorate was not detected in the samples collected from TMW22 during the October 2002 and April 2003 sampling events.

TMW25

Perchlorate was not detected in the samples collected from TMW25 during the October 2002 and April 2003 sampling events.

MW18D

Perchlorate was not detected in the samples collected from MW18D during the October 2002 and April 2003 sampling events. Perchlorate was also not detected in the duplicate sample collected in April 2003.

MW20

Perchlorate was not detected in the samples collected from MW20 during the October 2002 and April 2003 sampling events.

MW22D

Perchlorate was not detected in the samples collected from MW22D during the October 2002 and April 2003 sampling events. Perchlorate was also not detected in the duplicate sample collected in October 2002.

MW22S

Perchlorate was not detected in the samples collected from MW22S during the October 2002 and April 2003 sampling events.

MW-1

Perchlorate was not detected in the samples collected from MW-1 during the October 2002 and April 2003 sampling events.

MW-2

Perchlorate was not detected in the samples collected from MW-2 during the October 2002 and April 2003 sampling events.

MW-3

Perchlorate was not detected in the samples collected from MW-3 during the October 2002 and April 2003 sampling events.

TMW06

Perchlorate was not detected in the samples collected from TMW06 during the October 2002 and April 2003 sampling events.

TMW08

Perchlorate was not detected in the samples collected from TMW08 during the October 2002 and April 2003 sampling events.

TMW23

Perchlorate was not detected in the samples collected from TMW23 during the October 2002 and April 2003 sampling events. Perchlorate was also not detected in the duplicate sample collected in April 2003.

TMW24

Perchlorate was not detected in the samples collected from TMW24 during the October 2002 and April 2003 sampling events.

TWM10

Perchlorate was not detected in the samples collected from TMW10 during the October 2002 and April 2003 sampling events. Perchlorate was also not detected in the duplicate sample collected in October 2002.

TMW26

Perchlorate was not detected in the samples collected from TMW26 during the October 2002 and April 2003 sampling events.

SMW01

Perchlorate was not detected in the samples collected from SMW01 during the October 2002 and April 2003 sampling events.

TMW27

Perchlorate was not detected in the samples collected from TMW27 during the October 2002 and April 2003 sampling events. Perchlorate was also not detected in the duplicate sample collected in October 2002.

Wingate89

Perchlorate was not detected in the sample collected from Wingate89 during the October 2002 and April 2003 sampling events.

Wingate90

Perchlorate was not detected in the sample collected from Wingate90 during the October 2002 sampling event. Perchlorate was also not detected in the duplicate sample collected in October 2002.

No samples were collected from Wingate90 in April 2003.

Wingate91

Perchlorate was not detected in the samples collected from Wingate91 during the October 2002 and April 2003 sampling events.

SUPPLYWELL 54* *(NTUA 16T-602)

Perchlorate was not detected in the sample collected from SUPPLYWELL 54 during the October 2002 sampling event.

No samples were collected from SUPPLYWELL 54 during the April 2003 sampling event.

SUPPLYWELL 55* *(NTUA 16T-538UNC)

Perchlorate was not detected in the sample collected from SUPPLYWELL 55 during the October 2002 sampling event.

No samples were collected from SUPPLYWELL 55 during in April 2003.

TMW28

Perchlorate was not detected in the samples collected from TMW28 during the October 2002 and April 2003 sampling events.

Perchlorate Summary

The data indicate that the TNT Leaching Beds have not been a source of ground water contamination by perchlorate. The source of the detected perchlorate appears to be located within the area designated as the Workshop Area (portions of Parcels 6, 21 and 22).

5.1.1.4 Volatile Organic Compounds

A select number of wells, primarily in the Administration Area and in areas downgradient (north and northwest) of the Administration Area were sampled for VOCs as part of the current investigation. The rationale supporting this effort focused on the possibility that maintenance and other light industrial processes known to have been conducted within the Administration Area may have resulted in releases of spent solvents and other hydrocarbon-based compounds.

VOCs were detected in several wells in the area of investigation. The results are discussed further in the following sections. 1,2-dichloroethane (12DCA) and toluene were the only VOCs that were consistently detected in more than two monitoring wells during the investigation. The 12DCA results are illustrated as 12DCA isoconcentration maps on Figures 21 and 22. Because toluene was not regularly detected, it was mapped as a presence/absence detection map instead of an isoconcentration map (Figure 23).

Area 1 – Upgradient Areas

No wells in the upgradient areas were sampled for VOCs as part of the current investigation.

Area 2 – Central Area

TMW21

VOCs were not detected in the sample collected from TMW21 during the October 2002 sampling event; however, a single VOC, toluene, was detected in the April 2003 sample (Table 8).

TMW22

VOCs were not detected in the samples collected from TMW22 during the October 2002 or April 2003 sampling events.

TMW25

VOCs were not detected in the samples collected from TMW25 during the October 2002 sampling event; however, toluene, was detected in the April 2003 sample (Table 8).

TMW29

VOCs were not detected in the samples collected from TMW29 during the October 2002 or April 2003 sampling events.

Area 3 – Northern Area

MW18D

A single VOC, 12DCA, was detected in the samples collected from MW18D during the October 2002 and April 2003 sampling events (Table 8).

A duplicate sample was collected from MW18D in April 2003. The duplicate sample results closely resemble and confirm the detections in the parent sample.

MW20

A single VOC, 12DCA, was detected in the samples collected from MW20 during both the October 2002 and April 2003 sampling events (Table 8). Two additional VOCs (bromomethane and toluene) were detected in the April 2003 sample (Table 8).

MW22D

A single VOC, 12DCA, was detected in the samples collected from MW22D during the October 2002 and April 2003 sampling events (Table 8). VOCs were not detected in the duplicate sample collected in October 2002.

MW22S

A single VOC, 12DCA, was detected in the samples collected from MW22S during the October 2002 and April 2003 sampling events (Table 8). Two additional VOCs (1,1,1-Trichloroethane [TCA] and methyl-t-butyl ether[MTBE]) were detected in the April 2003 sample (Table 8)

MW-1

A single VOC, 12DCA, was detected in the samples collected from MW-1 during the October 2002 and April 2003 sampling events (Table 8). Additionally, toluene was detected in the October 2002 sample (Table 8).

MW-2

A single VOC, 12DCA, was detected in the samples collected from MW-2 during the October 2002 and April 2003 sampling events (Table 8). Additionally, toluene was detected in the October 2002 sample (Table 8).

MW-3

VOCs were not detected in the samples collected from MW-3 during the October 2002 and April 2003 sampling events.

TMW08

VOCs were not detected in the sample collected from TMW08 during the October 2002 sampling event. A single VOC, toluene, was detected in the sample collected from TMW08 in April 2003 (Table 8).

TMW23

VOCs were not detected in the samples collected from TMW23 during the October 2002 and April 2003 sampling events. VOCs were also not detected in the duplicate sample collected in April 2003.

TMW24

VOCs were not detected in the samples collected from TMW24 during the October 2002 and April 2003 sampling events.

TWM10

VOCs were not detected in the sample collected from TMW10 during the October 2002 sampling event. VOCs were also not detected in the duplicate sample collected in October 2002.

A single VOC, toluene, was detected in the April 2003 sample (Table 8).

TMW26

A single VOC, toluene, was detected in the sample collected from TMW26 during the October 2002 sampling event (Table 8). VOCs were not detected in the April 2003 sample.

TMW27

A single VOC, toluene, was detected in the sample collected from TMW27 during the October 2002 sampling event (Table 8). A duplicate sample was collected in October 2002. The duplicate sample results closely resemble and confirm the detections in the parent sample.

VOCs were not detected in the April 2003 sample.

Area 3 Summary

The detectable levels of 12DCA were found to be clustered in two areas immediately adjacent to two former underground tank locations. Approximately 50% of the detected levels were greater than the NMWQCC standard of 10 ug/L.

Toluene was detected in 7 monitoring wells, most of which are located adjacent to or downgradient of former underground tank locations. All detected concentrations were at least 2 to 3 orders of magnitude less than the NMWQCC standard of 750 ug/L.

Area 4 – Far Northern Area

As described in the following sections, VOCs were not detected in the wells located within the designated Far Northern Area.

Wingate89

VOCs were not detected in the samples collected from Wingate89 during the October 2002 and April 2003 sampling events.

Wingate90

VOCs were not detected in the sample collected from Wingate90 during the October 2002 sampling event. VOCs were also not detected in the duplicate sample collected in October 2002.

No samples were collected in April 2003.

Wingate91

VOCs were not detected in the samples collected from Wingate91 during the October 2002 and April 2003 sampling events.

SUPPLYWELL 54 (NTUA 16T-602)

VOCs were not detected in the sample collected from SupplyWell 54 during the October 2002 sampling event.

No samples were collected from SupplyWell 54 in April 2003.

SUPPLYWELL 55 (NTUA 16T-538UNC)

VOCs were not detected in the sample collected from SupplyWell 55 during the October 2002 sampling event.

No samples were collected from SupplyWell 55 in April 2003.

TMW28

VOCs were not detected in the samples collected from TMW28 during the October 2002 and April 2003 sampling events.

5.1.1.5 Pesticides

Pesticides were detected in a number of wells in the Administration Area. The results are discussed further in the following sections. The results are illustrated as total pesticides isoconcentration maps on Figures 24 and 25.

TMW25

No pesticide sample was collected from TMW25 during the October 2002 sampling event. Pesticides were not detected in the April 2003 sample.

MW18D

Pesticides were not detected in the samples collected from MW18D during the October 2002 and April 2003 sampling events.

A duplicate sample was collected from MW18D during in April 2003. A single pesticide, lindane, was detected (Table 8).

MW20

Two pesticides (DDE and methoxychlor) were detected in the sample collected from MW20 during the October 2002 sampling event (Table 8). Two pesticides (endosulfan II and heptachlor epoxide) were detected in the April 2003 sample.

MW22D

Pesticides were not detected in the sample collected from MW22D during the October 2002 sampling event. Two pesticides (endosulfan sulfate and lindane) were detected in the April 2003 sample (Table 8).

MW22S

Two pesticides (DDE and methoxychlor) were detected in the sample collected from MW22S during the October 2002 sampling event (Table 8). Three pesticides (endrin ketone, heptachlor epoxide, and lindane) were detected in the April 2003 sample.

MW-1

Four pesticides (DDE, DDT, lindane, and methoxychlor) were detected in the sample collected from MW-1 during the October 2002 sampling event (Table 8). A single pesticide, endosulfan II, was detected in the April 2003 sample.

MW-2

Pesticides were not detected in the sample collected from MW-2 during the October 2002 sampling event. Three pesticides (beta-BHC, DDT, and endosulfan sulfate) were detected in the April 2003 sample (Table 8).

MW-3

A single pesticide, DDE, was detected in the sample collected from MW-3 during the October 2002 sampling event (Table 8). Pesticides were not detected in the April 2003 sample.

TMW08

A single pesticide, endrin ketone, was detected in the sample collected from TMW08 during the October 2002 sampling event (Table 8). Two pesticides (endosulfan II and endosulfan sulfate) were detected in the April 2003 sample.

TMW23

No sample was collected for pesticides from TMW23 during the October 2002 sampling event.

Three pesticides (DDT, heptachlor epoxide, and lindane) were detected in the April 2003 sample (Table 8). A duplicate sample was collected in April 2003. Two of the three pesticides (heptachlor epoxide and lindane) detected in the parent sample were also detected in the duplicate sample; DDT was not detected. Additionally, beta-BHC was detected in the April 2003 duplicate sample.

TMW24

No sample was collected for pesticides from TMW24 during the October 2002 sampling event.

Two pesticides (beta-BHC and lindane) were detected in the April 2003 sample (Table 8).

TMW10

Pesticides were not detected in the sample collected from TMW10 during the October 2002 sampling event. A single pesticide, endrin ketone, was detected in the duplicate sample collected in October 2002 (Table 8).

Pesticides were not detected in the April 2003 sample.

TMW26

No sample was collected for pesticides from TMW26 during the October 2002 sampling event.

Five pesticides (DDT, endosulfan I, endosulfan II, endosulfan sulfate, and endrin) were detected in the April 2003 sample (Table 8).

SMW01

No sample was collected for pesticides from SMW01 during the October 2002 sampling event.

Pesticides were not detected in the April 2003 sample.

Pesticides Summary

The pesticide data indicate that ground water underlying the many buildings and structures within the Administration Area has been impacted by trace levels of various pesticide compounds. The data do not indicate if these impacts are associated with the approved application of pesticides or are related to releases from pesticide storage or mixing sites.

5.1.1.6 Metals

A total of 14 wells (9 newly completed wells and 5 existing wells) were sampled for metals as part of the current investigation. These wells were located within Area 2 - Central Area (TMW21, TMW22, TMW25, and TMW29), Area 3 – Northern Area (TMW23, TMW24, TMW26, and TMW27) and in Area 4 - Far Northern Area (Wingate89, Wingate90, Wingate91, SUPPLYWELL 54, SUPPLYWELL 55, and TMW28), as defined by this report. A number of metals were detected at each of the monitoring wells. As a result, this report presents a substantial quantity of metals data.

As discussed in Section 5.0, this report will present the metals data without any substantial assessment. Complete assessment of the metals data will be presented as part of the RFI work plan or RA process to be completed in compliance with the conditions of the pending RCRA Closure Permit for FWDA.

Area 2 – Central Area

TMW29

A total of 17 metals (aluminum, arsenic, barium, beryllium, calcium, chromium, cobalt, iron, lead, magnesium, manganese, potassium, selenium, sodium, thallium, vanadium, and zinc) were detected in the total metals sample fraction collected from TMW29 during the October 2002 sampling event (Table 8). A total of 13 metals (aluminum, arsenic, barium, calcium, chromium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

Nineteen metals were detected in the total metals sample fraction collected from TMW29 during the April 2003 sampling event (Table 8). The total metal constituents detected in the April 2003 sample were the same as the total metals detected in October 2002 with two additional total metals (copper and nickel). A total of 14 metals were detected in the dissolved metals sample fraction collected in April 2003. The dissolved metals detected in the April 2003 sample were nearly the same as the dissolved metals detected in October 2002. Two additional dissolved metals (lead and thallium) were detected in the April 2003 sample. The previously identified dissolved metal, chromium, was not detected in the April 2003 sample.

TMW21

A total of 13 metals (aluminum, arsenic, barium, calcium, cobalt, iron, lead, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the total metals sample fraction collected from TMW21 during the October 2002 sampling event (Table 8). Ten metals (arsenic, barium, calcium, cobalt, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A total of 12 metals were detected in the total metals sample fraction collected from TMW21 during the April 2003 sampling event (Table 8). The total metals detected in the April 2003 sample were nearly the same as the total metals detected in October 2002. One additional total metal, zinc, was also detected in the sample collected in April 2003. The previously identified total metals, lead and potassium, were not detected in the April 2003 sample. Eleven metals were detected in the dissolved metals sample in April 2003. The dissolved metals detected in the April 2003 sample were nearly the same at the dissolved metals detected in October 2002. Two additional dissolved metals (aluminum and zinc) were detected in the April 2003 sample. The previously identified dissolved metal, potassium, was not detected or confirmed in the April 2003 sample.

TMW22

A total of 12 metals (aluminum, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, thallium, and vanadium) were detected in the total metals sample fraction collected from TMW22 during the

October 2002 sampling event (Table 8). Twelve metals (aluminum, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A total of 20 metals were detected in the total metals sample fraction collected from TMW22 during the April 2003 sampling event (Table 8). The total metals detected in the April 2003 sample were similar to the detections in the October 2002 sample. Eight additional total metals (arsenic, beryllium, chromium, copper, lead, mercury, nickel, and zinc) were also detected in the April 2003 sample. Sixteen metals were detected in the dissolved metals sample collected in April 2003. The dissolved metals detected in the April 2003 sample were nearly the same as the dissolved metals detected during in October 2002. Four additional dissolved metals (beryllium, copper, lead, and zinc) were also detected in the April 2003 sample.

TMW25

A total of 13 metals (aluminum, arsenic, barium, calcium, cobalt, copper, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the total metals sample fraction collected from TMW25 during the October 2002 sampling event (Table 8). Eleven metals (arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A total of nine metals were detected in the total metals sample fraction collected from TMW25 during the April 2003 sampling event (Table 8). Two additional total metals (lead and zinc) were also detected in the April 2003 sample. Six previously identified total metals (arsenic, copper, iron, potassium, selenium, and vanadium) were not detected in the April 2003 sample. Nine metals were detected in the dissolved metals sample fraction collected from TMW25 during the April 2003 sampling event. Three additional dissolved metals (aluminum, lead, and zinc) were detected in the April 2003 sample. Five previously identified dissolved metals (arsenic, iron, potassium, selenium, and vanadium) were not detected in the April 2003 sample.

Area 3 – Northern Area

TMW23

A total of 14 metals (aluminum, arsenic, barium, calcium, cobalt, iron, lead, magnesium, manganese, potassium, selenium, sodium, thallium, and vanadium) were detected in the total metals sample fraction collected from TMW23 during the October 2002 sampling event (Table 8). Fourteen metals (arsenic, barium, cadmium, calcium, cobalt, copper, iron, magnesium, manganese, potassium, selenium, sodium, vanadium, and zinc) were detected in the dissolved metals sample collected in October 2002.

A total of 20 metal constituents were detected in the total metals sample fraction collected from TMW23 during the April 2003 sampling event (Table 8). Seven additional total metals (beryllium, chromium, copper, mercury, nickel, silver, and zinc) were also detected in the April 2003 sample. One previously identified total metal, selenium, was not detected in the April 2003 sample. Ten metals were detected in the dissolved metals sample fraction collected from TMW23 during the April 2003 sampling event. One additional dissolved metal, antimony, was detected in the April 2003 sample. Five previously identified dissolved metals (arsenic, cadmium, copper, iron, and vanadium) were not detected in the April 2003 sample.

A duplicate sample was collected from TMW23 in April 2003. A total of 20 metals were detected in the total metals duplicate sample fraction of this duplicate sample (Table 8). The total metals detected in the duplicate sample closely resemble and confirm the detections in the parent sample. A total of 11 metals were detected in the dissolved metals duplicate sample fraction collected from TWM23 in April 2003. The dissolved metals detected in the duplicate sample closely resemble and confirm the detections in the parent sample. Two additional dissolved metals (lead and vanadium) were also detected in the duplicate sample collected in April 2003. One previously identified dissolved metal, antimony, was not detected in the April 2003 duplicate sample.

TMW24

A total of 13 metals (aluminum, antimony, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the total metals sample fraction collected from TMW24 during the October 2002 sampling event (Table 8). Thirteen metals (antimony, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, vanadium, and zinc) were detected in the dissolved metals sample fraction collected in October 2002.

A total of 17 metals were detected in the total metals sample fraction collected from TMW24 during the April 2003 sampling event (Table 8). The total metals detected in this sample were similar to the detections in the October 2002 sample. Six additional total metals (beryllium, chromium, copper, lead, silver, and zinc) were also detected in the April 2003 sample. Two previously identified total metals (antimony and selenium) were not detected in the April 2003 sample. A total of 15 metals were detected in the dissolved metals sample fraction collected from TMW24 during the April 2003 sampling event. The dissolved metals detected in this sample were similar to the detections in the October 2002 sample. Four additional dissolved metals (aluminum, beryllium, copper, and lead) were also detected in the April 2003 sample. Two previously identified dissolved metals (antimony and arsenic) were not detected or confirmed in the April 2003 sample.

TMW26

A total of 12 metals (aluminum, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the total metals sample fraction collected from TMW26 during the October 2002 sampling event (Table 8). Twelve metals (aluminum, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample fraction collected in October 2002.

A total of 18 metals were detected in the total metals sample fraction collected from TMW26 during the April 2003 sampling event (Table 8). The total metals detected in this sample were similar to the detections in the October 2002 sample. Six additional total metals (beryllium, chromium, copper, lead, nickel, and zinc) were also detected in the April 2003 sample. A total of 13 metals were detected in the dissolved metals sample fraction collected from TMW26 during the April 2003 sampling event. The dissolved metals detected in this sample were similar to the detections in the October 2002 sample. Three additional dissolved metals (copper, lead, and zinc) were also detected in the April 2003 sample. Two previously identified dissolved metals (arsenic and selenium) were not detected or confirmed in the April 2003 sample.

TMW27

A total of 11 metals (aluminum, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the total metals sample fraction collected from TMW27 during the October 2002 sampling event (Table 8). Ten metals (arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A duplicate sample was collected from TMW27 in October 2002. A total of 12 metals (aluminum, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the total metals duplicate sample collected in October 2002 (Table 8). The total metals detected in this duplicate sample closely resemble and confirm the detections in the parent sample. A total of 10 metals (arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the dissolved metals duplicate sample collected from TWM27 in October 2002. The dissolved metals detected in this duplicate sample closely resemble and confirm the detections in the parent sample.

A total of 13 metals were detected in the total metals sample fraction collected from TMW27 during the April 2003 sampling event (Table 8). The total metals detected in this sample were similar to the detections in the October 2002 sample. Four additional total metals (lead, mercury, thallium, and zinc) were also detected in the April 2003 sample. Two previously identified total metals (potassium and vanadium) were not detected in the April 2003 sample. A total of ten metals were detected in the dissolved metals sample collected from TMW27 during the April 2003 sampling event. The dissolved metals detected in this sample were similar to the detections in the October 2002 sample. Three additional dissolved metals (lead, mercury, and zinc) were also detected in the April 2003 sample. Three previously identified dissolved metals (iron, potassium, and vanadium) were not detected or confirmed in the April 2003 sample.

Area 4 – Far Northern Area

<u>Wingate89</u>

A total of 16 metals were detected in the total metals sample fraction collected from Wingate89 during the October 2002 sampling event (Table 8). Ten metals (arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the dissolved metals sample.

A total of 15 metals were detected in the total metals sample collected from Wingate89 during the April 2003 sampling event (Table 8). The total metals detected in this sample were similar to the detections in the sample collected in October 2002. One additional total metal, thallium, was also detected in the April 2003 sample. Two previously identified total metals (arsenic and chromium) were not detected in the April 2003 sample. A total of 11 metals were detected in the dissolved metals sample collected in April 2003 sampling event. The dissolved metals detected in this sample were similar to the detections in the October 2002 sample. Three additional dissolved metals (aluminum, lead, sodium, and zinc) were also detected in the April 2003 sample. Two previously identified dissolved metals (arsenic and vanadium) were not detected or confirmed in the April 2003 sample.

<u>Wingate90</u>

A total of 14 metals were detected in the total metals sample fraction collected from Wingate90 during the October 2002 sampling event (Table 8). Nine metals (barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the dissolved metals sample fraction collected in October 2002.

A duplicate sample was collected from Wingate90 during the October 2002 sampling event. Fourteen metals were detected in this total metals duplicate sample (Table 8). The total metals detected in this duplicate sample closely resemble and confirm the detections in the parent sample. One additional total metal, cadmium, was also detected in this duplicate sample. One previously identified total metal, beryllium, was not detected in the duplicate sample. Nine metals were detected in the dissolved metals duplicate sample collected in October 2002. The dissolved metals detected in this duplicate sample closely resemble and confirm the detections in the parent sample. One additional dissolved metal, antimony, was also detected in the duplicate sample. One previously identified dissolved metal, iron, was not detected or confirmed in the duplicate sample.

No samples were collected from Wingate90 during the April 2003 sampling event.

Wingate91

A total of 10 metals (arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the total metals sample fraction collected from Wingate91 during the October 2002 sampling event (Table 8). Eleven metals (arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A total of 13 metals were detected in the total metals sample collected from Wingate91 during the April 2003 sampling event (Table 8). The total metals detected in the April 2003 sample were similar to the detections in the October 2002 sample. Four additional total metals (antimony, lead, thallium, and zinc) were also detected in the April 2003 sample. One previously identified total metal, vanadium, was not detected in the April 2003 sample. Eleven metals were detected in the dissolved metals sample collected in April 2003. The dissolved metals detected in this sample were similar to the detections in the October 2002 sample. Two additional dissolved metals (lead and zinc) were also detected in the April 2003 sample. Two previously identified dissolved metals (selenium and vanadium) were not detected in the April 2003 sample.

SUPPLYWELL 54 (NTUA 16T-602)

A total of 13 metals (barium, calcium, cobalt, copper, iron, lead, magnesium, manganese, potassium, selenium, sodium, vanadium, and zinc) were detected in the total metals sample fraction collected from SUPPLYWELL 54 during the October 2002 sampling event (Table 8). Eleven metals (barium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, sodium, vanadium, and zinc) were detected in the dissolved metals sample collected in October 2002.

No samples were collected from SUPPLYWELL 54 during the April 2003 sampling event.

SUPPLYWELL 55 (NTUA 16T-538UNC)

A total of 10 metals (barium, calcium, cobalt, magnesium, manganese, potassium, selenium, sodium, vanadium, and zinc) were detected in the total metals sample fraction collected from SUPPLYWELL 55 during the October 2002 sampling event (Table 8). The same ten metals (barium, calcium, cobalt, magnesium, manganese, potassium, selenium, sodium, vanadium, and zinc) were detected in the dissolved metals sample fraction collected in October 2002.

No samples were collected from SUPPLYWELL 55 during the April 2003 sampling event.

TMW28

A total of 14 metals were detected in the total metals sample fraction collected from TMW28 during the October 2002 sampling event (Table 8). Eleven metals (antimony, arsenic, barium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A total of 11 metals were detected in the total metals sample collected from TMW28 during the April 2003 sampling event (Table 8). The total metals detected in the sample collected in April 2003 were similar to the detections in the October 2002 sample. One additional total metal, zinc, was also detected in the April 2003 sample. Four previously identified total metals (antimony, arsenic, beryllium, and potassium) were not detected in the April 2003 sample. Eight metals were detected in the dissolved metals sample collected in April 2003. The dissolved metals detected in the April 2003 sample were similar to the detections in the October 2002 sample. Two additional dissolved metals (aluminum and lead) were also detected in the April 2003 sample. Five previously identified dissolved metals (antimony, arsenic, iron, potassium, and vanadium) were not detected in the April 2003 sample.

5.1.1.7 Field Parameters

Final field parameter results collected during pre-sample purging for the October 2002 and April 2003 sampling events are provided in Table 9.

5.1.2 Second Unconsolidated Water-Bearing Zone

The pilot boring program at the TNT Leaching Beds, as described in the RFI Report (PMC, 2001b) identified that the second unconsolidated water-bearing zone was of very limited areal extent. As a result, only a single well (TMW07) was completed in this water-bearing zone. TMW07 and the second unconsolidated water-bearing zone are located northwest of the TNT Leaching Beds, adjacent to the southeast corner of the Administration Area.

Analytical data results from both the October 2002 and April 2003 sampling events are presented in Table 10. Field water quality parameters collected during pre-sample purging are presented in Table 11.

5.1.2.1 Explosive Compounds

TMW07

One explosive compound, the RDX transformation product MNX, was detected in the sample collected from TMW07 during the October 2002 sampling event (Table 10).

Two explosive compounds were detected in the sample collected from TMW07 during the April 2003 sampling event. One RDX transformation product (DNX) and one TNT photodegradation product (TNB) were detected in this sample (Table 10). The previously identified RDX transformation product, MNX, was not detected in the April 2003 sample.

5.1.2.2 Nitrate/Nitrite

<u>TMW07</u>

Nitrate and nitrite were detected in the sample collected from TMW07 during the October 2002 sampling event (Table 10). The detected concentrations were at least one order of magnitude less than regulatory levels.

Neither nitrate nor nitrite were detected in the April 2003 sample.

5.1.2.3 Perchlorate

<u>TMW07</u>

Perchlorate was not detected in the samples collected from TMW07 during the October 2002 and April 2003 sampling events.

5.1.2.4 Volatile Organic Compounds

<u>TMW07</u>

No samples were collected for VOC analysis from TMW07 during the October 2002 and April 2003 sampling events.

5.1.2.5 Pesticides

<u>TMW07</u>

No samples were collected for pesticide analysis from TMW07 during the October 2002 and April 2003 sampling events.

5.1.2.6 Metals

<u>TMW07</u>

No samples were collected for metal analysis from TMW07 during the October 2002 and April 2003 sampling events.

5.1.2.7 Field Parameters

Final field parameter results collected during pre-sample purging during the October 2002 and April 2003 sampling events are provided in Table 11.

5.1.3 First Sandstone Water-Bearing Zone

The pilot boring program at the TNT Leaching Beds, as described in the RFI Report (PMC, 2001b) identified that the first sandstone water-bearing zone was of very limited areal extent. As a result, only a single well (TMW02) was completed in this geologic unit. TMW02 is located west of the TNT Leaching Beds.

Analytical data results from both the October 2002 and April 2003 sampling events are presented in Table 12. Field water quality parameters collected during pre-sample purging are presented in Table 13.

5.1.3.1 Explosive Compounds

<u>TMW02</u>

A total of three explosive compounds were detected in the sample collected from TMW02 during the October 2002 sampling event (Table 12). One TNT photodegradation product (NB) and two TNT transformation products (4ADNT and 26DANT) were detected in this sample.

A total of five explosive compounds were detected in the sample collected from TMW02 during the April 2003 sampling event (Table 12).

One previously detected explosive compound (26DANT) was detected again in the April 2003 sample. The previously identified TNT photodegradation product (NB) and the TNT transformation product (4ADNT) were not detected in the April 2003 sample.

Two parent explosive compounds (TNT and RDX) and two TNT manufacturing components (2NT and 3NT) were detected only in the April 2003 sample.

5.1.3.2 Nitrate/Nitrite

<u>TMW02</u>

Nitrate was detected in the samples collected from TMW02 during the October 2002 and April 2003 sampling events (Table 12). Both detected concentrations were greater than the NMWQCC standard.

Nitrite was not detected in the samples collected from TMW02 during either the October 2002 or the April 2003 sampling event.

5.1.3.3 Perchlorate

<u>TMW02</u>

Perchlorate was not detected in the samples collected from TMW02 during the October 2002 and April 2003 sampling events.

5.1.3.4 Volatile Organic Compounds

TMW02

No samples were collected for VOCs from TMW02 during the October 2002 and April 2003 sampling events.

5.1.3.5 Pesticides

TMW02

No samples were collected for pesticides from TMW02 during the October 2002 and April 2003 sampling events.

5.1.3.6 Metals

TMW02

No samples were collected for metals from TMW02 during the October 2002 and April 2003 sampling events.

5.1.3.7 Field Parameters

Final field parameter results collected during pre-sample purging during the October 2002 and April 2003 sampling events are provided in Table 13.

5.1.4 Second Sandstone Water-Bearing Zone

Six wells (TMW05, TMW14A, TMW16, TMW17, TMW18, and TMW19) have been completed in the second sandstone water-bearing zone. Generally, these wells are located south and west of the TNT Leaching Beds. Previous ground water sampling data indicate that these areas are upgradient and/or cross-gradient to the primary area of impacts derived from historical operation of the TNT Leaching Beds.

Analytical data results from both the October 2002 and April 2003 sampling events are presented in Table 14. Field water quality parameters collected during pre-sample purging are presented in Table 15.

5.1.4.1 Explosive Compounds

Of the six wells completed in the second sandstone zone, only wells TMW05 and TMW14A were sampled for explosive compounds as part of the current investigation.

TMW05

No explosive compounds were detected in the samples collected from TMW05 during the October 2002 and April 2003 sampling events.

TMW14A

No explosive compounds were detected in the sample collected from TMW14A during the October 2002 sampling event.

A single explosive compound (the TNT manufacturing component, 24DNT) was detected in the sample collected from TMW14A during the April 2003 sampling event (Table 14).

5.1.4.2 Nitrate/Nitrite

Of the six wells completed in the second sandstone zone, only wells TMW05 and TMW14A were sampled for nitrate and nitrite as part of the current investigation.

TMW05

Nitrate was detected in the samples collected from TMW05 during both the October 2002 and the April 2003 sampling events (Table 14). The nitrate concentration detected in April 2003 was greater than the NMWQCC standard.

Nitrite was also detected in the sample collected from TMW05 during the April 2003 sampling event.

TMW14A

Nitrate and nitrite were not detected in the samples collected from TMW14A during the October 2002 and April 2003 sampling events.

5.1.4.3 Perchlorate

All six wells completed in the second sandstone zone were sampled for perchlorate.

TMW05

Perchlorate was detected in the samples collected from TMW05 during both the October 2002 and the April 2003 sampling events (Table 14). The detected concentration was greater than any of the environmental threshold values for perchlorate in ground water currently under consideration.

TMW14A

Perchlorate was not detected in the samples collected from TMW14A during the October 2002 and April 2003 sampling events.

TMW16

Perchlorate was not detected in the samples collected from TMW16 during the October 2002 and April 2003 sampling events.

TMW17

Perchlorate was not detected in the samples collected from TMW17 during the October 2002 and April 2003 sampling events.

TMW18

Perchlorate was not detected in the samples collected from TMW18 during the October 2002 and April 2003 sampling events.

TMW19

Perchlorate was not detected in the samples collected from TMW19 during the October 2002 and April 2003 sampling events.

5.1.4.4 Volatile Organic Compounds

Three of the six wells completed in the second sandstone zone were sampled for VOCs.

TMW14A

A single VOC, carbon disulfide, was detected in the sample collected from TMW14A during the October 2002 sampling event (Table 14).

No VOCs were detected in the sample collected from TMW14A during the April 2003 sampling event.

TMW16

No samples were submitted for VOC analysis from TMW16 during the October 2002 sampling event.

A single VOC, carbon disulfide, was detected in the sample collected from TMW16 during the April 2003 sampling event (Table 14).

TMW17

No samples were submitted for VOC analysis from TMW17 during the October 2002 sampling event.

A single VOC, carbon disulfide, was detected in the sample collected from TMW17 during the April 2003 sampling event (Table 14).

5.1.4.5 Pesticides

No samples were submitted for pesticide analysis from the second sandstone water-bearing zone during the October 2002 and April 2003 sampling events.

5.1.4.6 Metals

Of the six wells completed in the second sandstone zone, only well TMW14A was sampled for metals as part of the current investigation.

<u>TMW14A</u>

A total of 12 metals were detected in the total metals sample fraction collected from TMW14A during the October 2002 sampling event (Table 14). Nine metals (arsenic, barium, calcium, magnesium, manganese, potassium, selenium, sodium, and vanadium) were detected in the dissolved metals sample collected in October 2002.

A total of 15 metals were detected in the total metals sample fraction collected from TMW14A during the April 2003 sampling event (Table 14). The total metals detected in the April 2003 sample were similar to the detections in the October 2002 sample. Three additional total metals (beryllium, lead, and zinc) were also detected in the April 2003 sample (Table 14). Twelve metals were detected in the dissolved metals sample collected from TMW14A during the April 2003 sampling event (Table 14). The dissolved metals detected in the April 2003 sample were similar to the detections in the October 2002 sample. Three additional dissolved metals (cobalt, lead, and zinc) were also detected in the April 2003 sample (Table 14).

A duplicate sample was collected during the April 2003 sampling event. The total metals detected in the duplicate sample closely resemble and confirm the detections in the parent sample. Two additional total metals (antimony and copper) were also detected in this duplicate sample (Table 14). One previously identified total metal (beryllium) was not detected in the duplicate sample. The dissolved metals detected in the duplicate sample closely resemble and confirm the detections in the parent sample. One additional dissolved metal (antimony) was also detected in the duplicate (Table 14). Two previously identified dissolved metals (lead and potassium) were not detected or confirmed in the duplicate sample.

5.1.4.7 Field Parameters

Final field parameter results collected during pre-sample purging during the October 2002 and April 2003 sampling events are provided in Table 15.

5.2 INVESTIGATION DERIVED WASTE (IDW) ANALYTICAL RESULTS

5.2.1 Soil IDW

Two composite soil IDW characterization samples were collected from roll-off containers filled with drill cuttings. Results for these samples were compared to the RCRA TCLP maximum concentration values to determine if the soil cuttings were hazardous (USEPA, 1993). Soil IDW results are presented in Table 16.

No TCLP VOCs or explosive compounds were detected in the samples collected from the containerized soil.

Two TCLP SVOCs were detected in a single sample collected from the containerized soil. Both 1,4-dichlorobenzene and hexachlorobutadiene were detected in the roll-off container sample ROC01. Both SVOCs were detected at a concentration less their respective RCRA toxicity characteristic maximum concentration value. No SVOCs were detected in sample ROC02.

One TCLP metal was detected in both the samples collected from the containerized soil. Barium was detected in both samples at a concentration less than the RCRA toxicity characteristic maximum concentration value.

Based upon the soil IDW analytical results, soil generated during monitoring well installation activities was determined to be non-regulated and non-hazardous material and was disposed of in Waste Management's Rio Rancho, New Mexico Landfill as special waste. A copy of the waste manifests for the roll-off containers is provided in Appendix D.

5.2.2 Liquid IDW

Four liquid IDW characterization samples were collected from tanks containing decontamination fluids, monitoring well development water, and monitoring well pre-sample purge water. Results for these samples were compared to RCRA toxicity characteristic maximum concentration values to determine if the liquid IDW was hazardous (USEPA, 1993). Liquid IDW results are presented in Table 17.

Two VOCs were detected in the liquid IDW samples collected. One VOC (2-butanone) was detected in sample TANK03, and one VOC (tetrachloroethene) was detected in sample TANK06. Maximum concentration values for the RCRA toxicity characteristic do not exist for 2-butanone. Tetrachloroethene was detected at a concentration less than the RCRA toxicity characteristic maximum concentration value.

No RCRA SVOCs were detected in the samples collected.

Six explosive compounds were detected in the samples collected from the liquid IDW. Two explosive compounds (26DNT and 4ADNT) were detected in the TANK03 and TANK04 samples. Maximum concentration values for the RCRA toxicity characteristic do not exist for 26DNT or 4ADNT. One explosive compound, NB, was detected in three of the samples (TANK03, TANK04, and TANK06) collected. NB was detected at a concentration less than the RCRA toxicity characteristic maximum concentration value. Three explosive compounds (TNT, 4NT, and RDX) were detected in a single sample (TANK06) collected. Maximum concentration values for the RCRA toxicity characteristic do not exist for TNT, 4NT, or RDX.

Two RCRA metals (barium and chromium) were detected in the samples collected from the liquid IDW. All of the detected concentrations were less than their respective RCRA toxicity characteristic maximum concentration value.

Based upon the liquid IDW analytical results, the liquid IDW was determined to be non-hazardous and non-regulated. The liquid IDW was transported to and disposed of at Clean Harbor's Aragonite, Utah waste facility. A copy of the waste manifest for the liquid IDW disposal is provided in Appendix D.

6.0 CONCLUSIONS

6.1 SUMMARY OF GROUND WATER CONTAMINATION

The pre-2002 investigations had described a pattern of distribution for a number of chemical constituents (explosive compounds and nitrate/nitrite) associated with the operation of the former TNT Leaching Beds. The current investigation provided additional data that confirmed and/or expanded upon the delineation of the previously identified constituents and provided new data for constituents that previously had not been investigated (i.e., perchlorate).

6.1.1 First Unconsolidated Water-Bearing Zone

Thirty wells, including two off-site supply wells, are screened in the first unconsolidated water-bearing zone (Figure 5). Several explosive compounds, nitrate, nitrite, perchlorate, VOCs, and metal constituents were detected in the samples collected during the October 2002 and April 2003 sampling events (Table 8).

The presence and distribution of detected explosives compounds in ground water was confirmed and further defined by the data generated by the current investigation (Figures 13 and 14). The highest concentrations of explosive compounds were found in an area extending from the TNT Leaching Beds to the area east of the Administration Area (Figures 13 and 14). Explosives were not detected at the monitoring wells at the northern limit of the developed Administration Area or in wells located within the sediments of the Rio Puerco (including off-site supply wells). These data indicate that there is no off-site migration of explosives impacted ground water, and that no off-site receptors are currently at risk.

The data confirm that the ground water mound located in the central portion of the Administration Area does divert the flow of ground water impacted by explosive compounds to the northeast, of the Administration Area. A similar diversion to the northwest of the Administration Area was not identified.

The distribution of detected nitrate concentrations in ground water identified by the current investigation was generally similar to that described by the pre-2002 investigations (Figures 15 and 16). The highest concentrations of nitrate were identified in an area extending from the TNT Leaching Beds to the area just north of the Administration Area (Figures 15 and 16). A small area within the Administration Area had lower detections of nitrate than in the immediate surrounding areas during each of the two sampling events. These low nitrate detections may be attributable to dilution caused by the ground water elevation high (mound) located in the Administration Area (Figures 8, 9, 10, and 11). The ground water mound may be at least partially the result of a relatively large, as well as long-term, leak from the water storage tank located in the Administration Area near Building 34. Nitrate was not detected in the monitoring wells north of the Administration Area and closest to the Rio Puerco. The current data indicate the area impacted by nitrate extends farther to the east and west of the

Administration Area than previously defined. The presence of the ground water mound in the Administration Area may cause the nitrate impacts to spread out in the east-west direction through the Administration Area. The non-detects recorded in wells at the northern limit of the developed Administration Area indicate that off-site migration of nitrate in the first unconsolidated water-bearing zone is not occurring. Detectable levels (but still well below the NMWQCC standard) of nitrate were identified in one off-site water supply well (SUPPLYWELL 55/NTUA 16T 538-UNC) located north and west of the installation (Figure 15) in October 2002. However, wells located upgradient of this well (i.e., between this well and FWDA) were not found to contain detectable levels of nitrate, indicating that a source of nitrate not associated with the FWDA Administration and TNT Leaching Beds Areas exists somewhere in the vicinity of SUPPLYWELL 55/NTUA 16T-538UNC.

The presence and distribution of detected nitrite concentrations in ground water was confirmed and further defined by the current investigation (Figures 17 and 18). The highest concentrations of nitrite were identified in an area extending from the TNT Leaching Beds Area to the area just north of the Administration Area. A small area within the Administration Area had low level detections of nitrite. As explained above, these low level detections are most likely attributable to dilution from a known large potable water leak in the Administration Area. Nitrite was not detected in the wells located north of the Administration Area and closest to the Rio Puerco. These data indicate that off-site migration of nitrite in the first unconsolidated water-bearing zone is not occurring.

Perchlorate was detected at wells located to the south and southwest of the TNT Leaching Beds (Figures 19 and 20). These locations are up- or crossgradient of the TNT Leaching Beds Area. Therefore, the TNT Beds do not appear to be a source of perchlorate impacts to the ground water. There is no off-site migration of perchlorate in the first unconsolidated water-bearing zone from FWDA.

VOCs were detected at several wells in the Administration and TNT Leaching Beds Areas during this investigation. Most VOCs were detected in only one round of ground water sampling and not confirmed in the second ground water sampling event. However, both 12DCA and toluene were detected in several monitoring wells in the Administration Area during both ground water sampling events (Figures 21, 22, and 23). The highest concentrations of 12DCA and toluene are located within the central portion of the Administration Area. 12DCA and toluene were not detected in the wells located north of the Administration Area and closest to the Rio Puerco. This indicates that there is no off-site migration of 12DCA or toluene in the first unconsolidated water-bearing zone from FWDA.

Pesticides were detected at several wells in the vicinity of the Administration Area during the October 2002 ground water sampling event. Several additional wells were sampled for pesticides during the April 2003 sampling event to provide more data to determine the lateral extent of pesticide ground water contamination. The distribution of detected pesticide concentrations in ground water was defined and confirmed through the completion of both sampling events

(Figures 24 and 25). The highest concentration of total pesticides is located within the central portion of the Administration Area. The data do not indicate if the distribution of detected pesticides is the result of approved application of pesticides or associated with releases from pesticide storage or mixing areas.

Metals were detected at all wells within the area of investigation. The implications of the detection of metals in ground water will be comprehensively evaluated during the development of RFI work plans and RA reports to be completed in response to the requirements of the RCRA Permit for FWDA, currently in preparation.

6.1.2 Second Unconsolidated Water-Bearing Zone

A single well, TMW07, is screened within the second unconsolidated water-bearing zone (Figure 5). Only one monitoring well is located in this interval because of the limited areal extent of the water-bearing zone. Several explosive compounds, nitrate, and nitrite were detected in the sample collected from TMW07 during the October 2002 and April 2003 sampling events (Table 10). The data available to date suggest that migration of constituents in this water bearing unit is limited by the discontinuous nature of the unit.

6.1.3 First Sandstone Water-Bearing Zone

Only one monitoring well (TMW02) has been completed in this interval because of the limited areal extent of the water-bearing zone (Figure 5). Several explosive compounds and nitrate were detected in the sample collected from TMW02 during the October 2002 and April 2003 sampling events (Table 12). TMW02 is located west of the TNT Leaching Beds. The data available to date suggest that migration of constituents in this water bearing unit is limited by the discontinuous nature of the unit.

6.1.4 Second Sandstone Water-Bearing Zone

Six wells (TMW05, TMW14A, TMW16, TMW17, TMW18, and TMW19) are screened within the second sandstone water-bearing zone (Figure 5). A single explosive compound, nitrate, nitrite, perchlorate, one VOC, and several metals were detected in the samples collected from the second sandstone water-bearing zone during the October 2002 and April 2003 sampling events (Table 14). Although this unit has been identified over a larger area than the first sandstone water-bearing unit, the data available to date indicate that it is also of limited extent. Therefore, the migration of constituents within and beyond this unit may be limited.

6.2 TNT LEACHING BED GEOLOGY AND HYDROGEOLOGIC MODEL

6.2.1 Unconsolidated Water-Bearing Zones

Based upon pre-existing data and the new data generated by the current investigation, movement of ground water within the unconsolidated sediments (first and second unconsolidated water-bearing zones) found within the Administration and TNT Leaching Beds Areas appears to be limited by a number of physical factors. Bedrock outcrops (questas) consisting of low permeability claystone (Figure 6) are present to the east and south of the area of investigation. In all cases, boreholes completed near these outcrops/subcrops, identified that shallow ground water pinched out. In addition, north-south trending bedrock subcrops (Figure 6) appear to limit the extent of shallow ground water to the west of the area of investigation.

Ground water elevation measurements at well TMW28 generated by the current investigation indicate that the ground water level in the Rio Puerco sediments at TMW28 is approximately thirty feet higher than at wells completed in the same sediments farther to the west. TMW28 is constructed to the north of a large bedrock outcrop; this bedrock high point would be expected to continue in the subsurface, potentially forming a low permeability dam across the more permeable riverbed sediments. Ground water upstream (east) of this subsurface structure would be expected to accumulate behind a bedrock dam of this nature.

Alternately, local sediment structure in the immediate vicinity of TMW28 could result in the formation of a locally perched ground water zone. However, subsurface geologic information generated by the drilling of the monitoring wells in the Rio Puerco sediments do not indicate the presence of any perched zones of this nature.

The net effect of high ground water level at TMW28 is that the ground water within the Rio Puerco sediments acts as a hydraulic barrier, substantially inhibiting the northerly flow of ground water from FWDA. Ground water flow, which is generally northward within the TNT Beds and Administration Area, merges over a short distance with the westerly flow of ground water in the Rio Puerco sediments.

During the technical discussions within the FWDA BCT that generated the current investigation, it was noted that contaminants within the ground water that may migrate toward the Administration Area could be split into two plumes in response to the ground water mound present within the Administration Area. This scenario would result in a gap in the monitoring well network for ground water potentially moving to the west-northwest of the Administration Area. To address this possibility, monitoring well TMW25 was completed to the west of the Administration Area. The geologic data generated by the drilling of well TMW25 and borings TMW20 and TMW20A to the south of the Administration Area, indicate that a bedrock ridge exists that trends north-south from the area of Building 542 toward the Administration Area. The bedrock high exists in the subsurface to the southwest of the Administration Area, and appears to form a hydraulic barrier to ground water flow to the west-northwest.

6.2.2 Sandstone Water-Bearing Zones

The first sandstone water-bearing zone appears to be discontinuous, limited in areal extent, and contains limited amounts of ground water as suggested by the current data. Only one well, TMW02, is located in the first sandstone water-bearing zone.

The second sandstone water-bearing zone has been mapped somewhat continuously and regularly across the southwestern portion of the area of investigation. The data available to date suggest that ground water, and impacts to ground water in this geologic unit, are limited to the area in which the unit has been mapped.

7.0 REFERENCES

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PMC, 2001b. Final RCRA Facility Investigation Report, TNT Leaching Beds Area, Fort Wingate Depot Activity. PMC Environmental, 26 September 2001.

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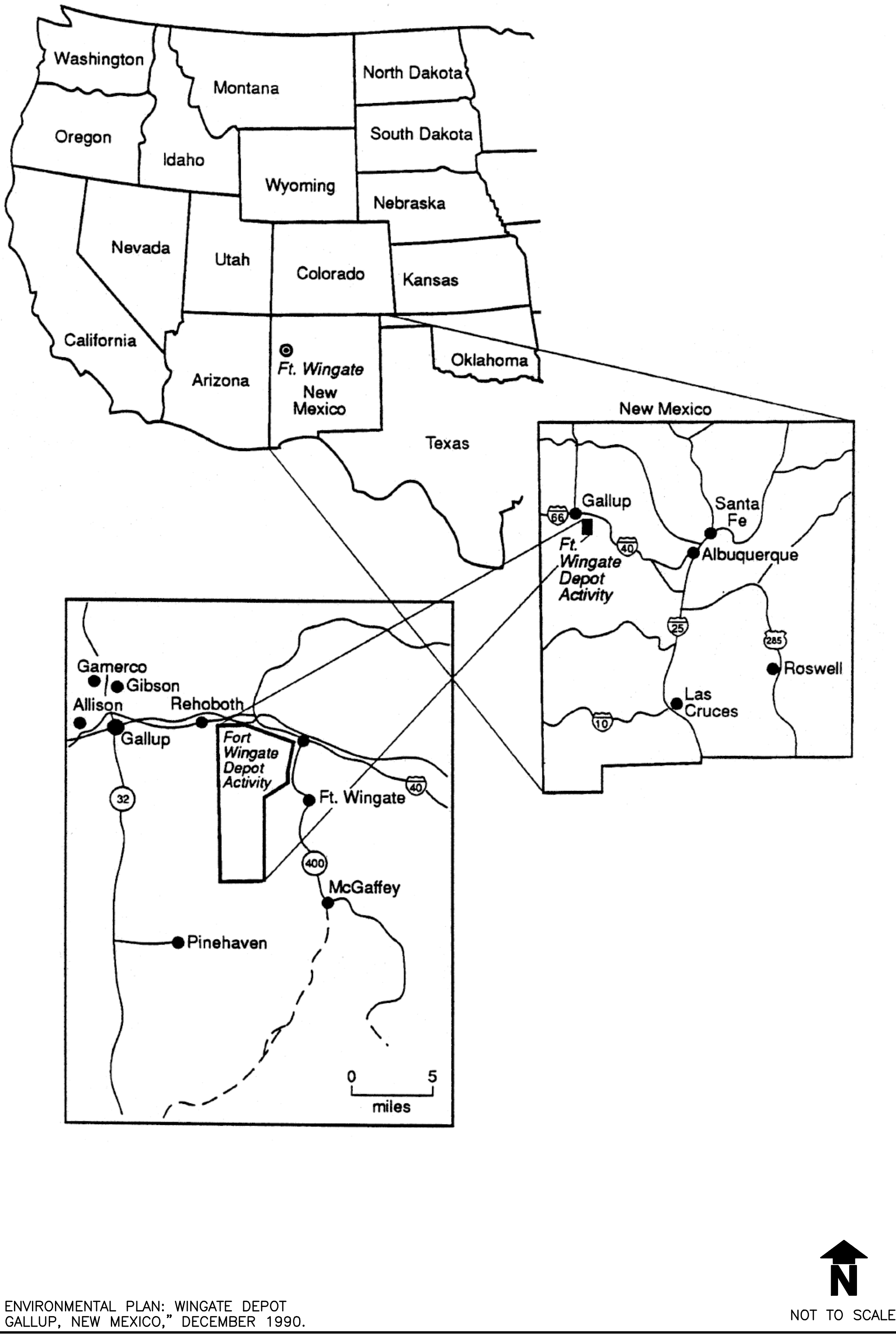
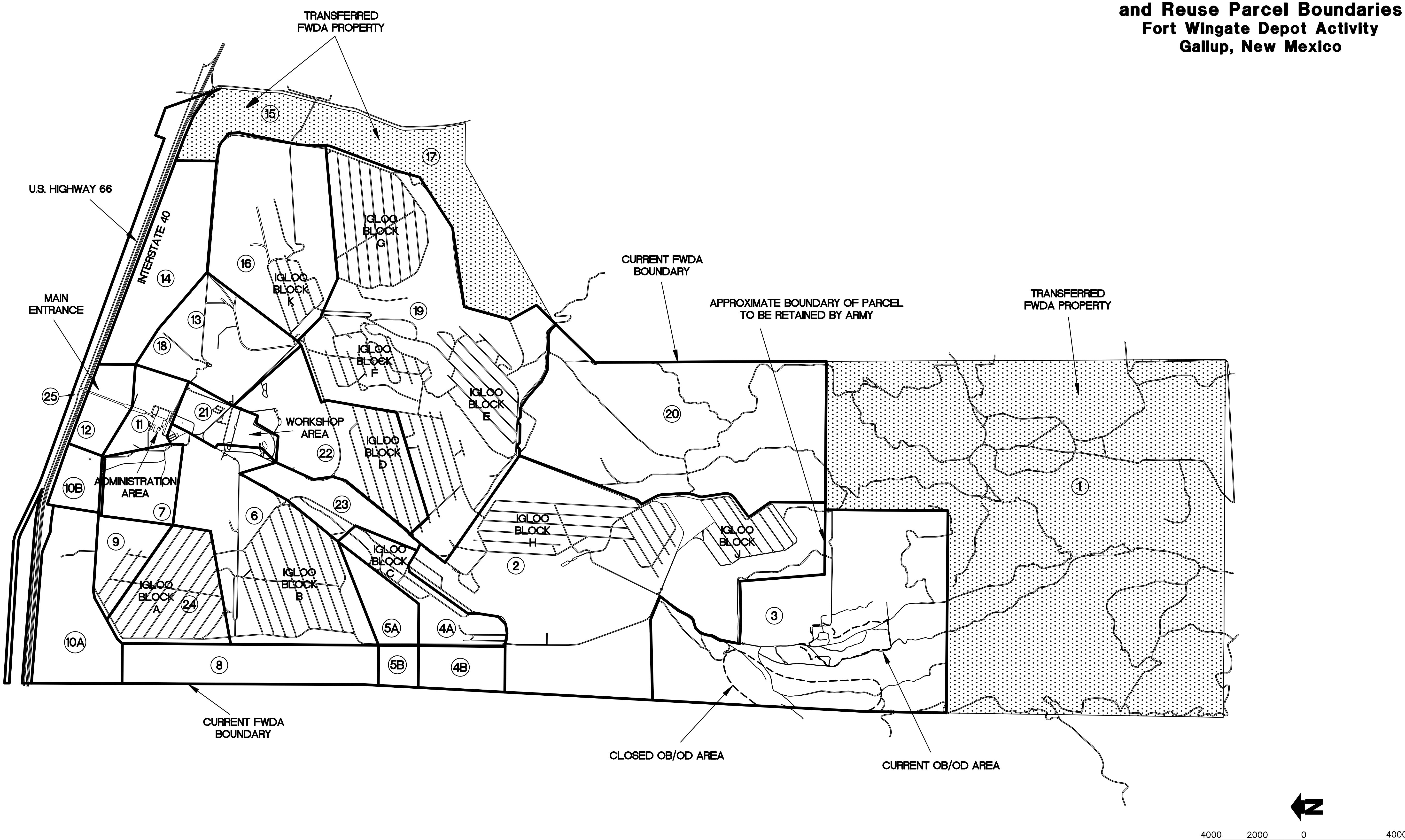
USEPA, 1993. Toxicity Characteristics, Code of Federal Regulations 40 Section 261.30.

Figure 1
Installation Location
Fort Wingate Depot Activity
Gallup, New Mexico



SOURCE: "MASTER ENVIRONMENTAL PLAN: WINGATE DEPOT ACTIVITY, GALLUP, NEW MEXICO," DECEMBER 1990.

Figure 2
Historical Land Use and Reuse Parcel Boundaries
Fort Wingate Depot Activity
Gallup, New Mexico



4000 2000 0 4000
SCALE IN FEET

TerranearPMC

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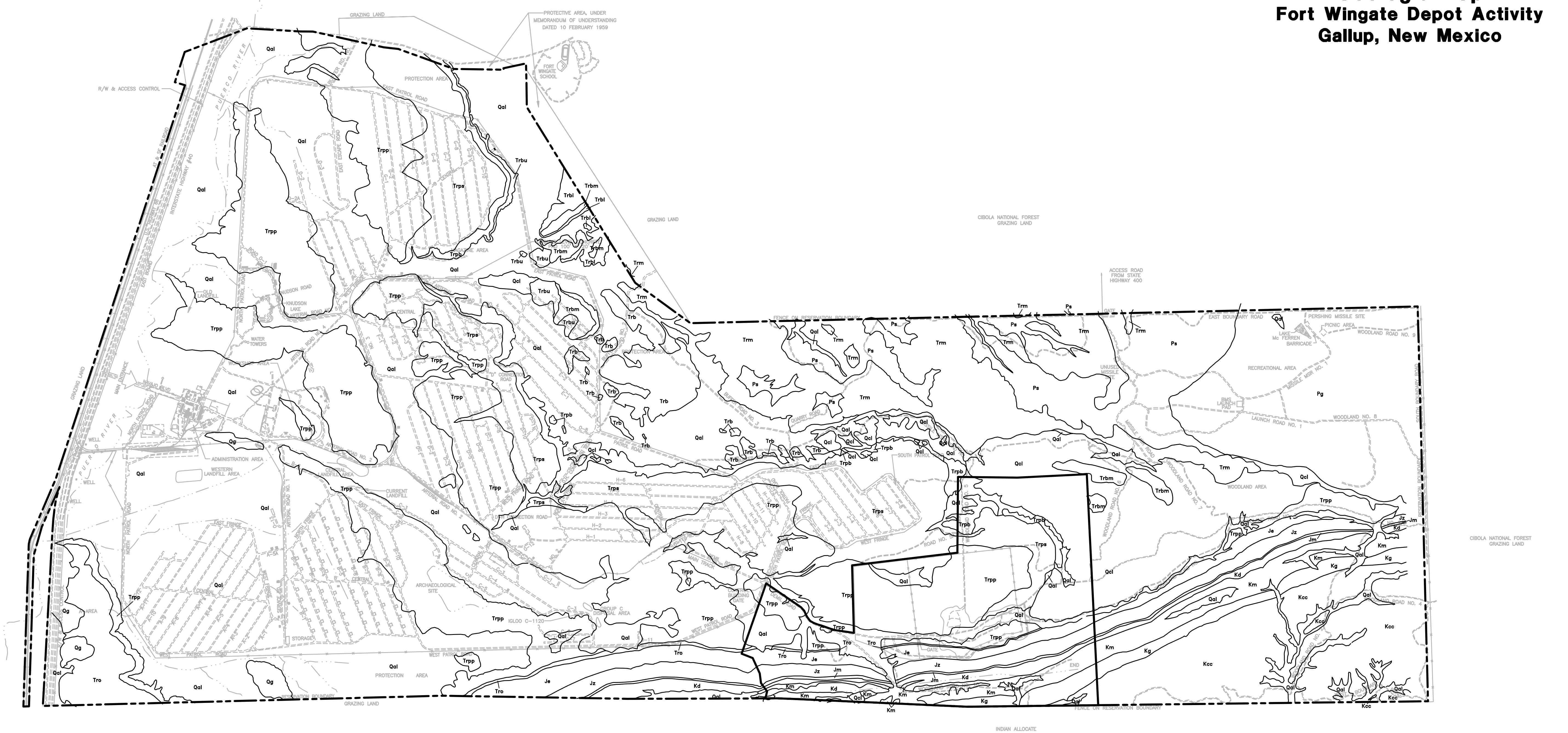
Figure 3
Geologic Map
Fort Wingate Depot Activity
Gallup, New Mexico



LEGEND

(dash-dot line)	INSTALLATION BOUNDARY
(solid line)	APPROXIMATE BOUNDARY OF OB/OD AREA TO BE RETAINED BY ARMY
Qal	QUATERNARY ALLUVIAL DEPOSITS
Qcl	QUATERNARY COLLUVIAL DEPOSITS
Qg	QUATERNARY GRAVEL
Kcc	CREVASSE CANYON FORMATION
Kg	GALLUP SANDSTONE
Km	MANCOS SHALE
Kd	DAKOTA SANDSTONE
Jm	MORRISON FORMATION
Jz	ZUNI SANDSTONE
Je	ENTRADA SANDSTONE
Tro	OWL ROCK FORMATION
Trpp	PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER
Trps	PETRIFIED FOREST FORMATION, SONSELA SANDSTONE MEMBER
Trpb	PETRIFIED FOREST FORMATION, BLUE MESA MEMBER
Trb	BLUEWATER CREEK FORMATION
Trbu	BLUEWATER CREEK FORMATION, UPPER MEMBER
Trbm	BLUEWATER CREEK FORMATION MCGAFFEY MEMBER
Trbl	BLUEWATER CREEK FORMATION LOWER MEMBER
Trm	SHINARUMP FORMATION AND MOENKOPI FORMATION DIVIDED
Psa	SAN ADREAS LIMESTONE
Pg	GLORIETA SANDSTONE

NOTES

1. BASE MAP SCANNED FROM FORT WINGATE DEPOT ACTIVITY GENERAL SITE MAP, JULY 1986, U.S. ARMY CORPS OF ENGINEERS.
2. 2 SOURCES OF MAPS OVERLAIN, ACTUAL DISTANCES APPROXIMATE FOR PRESENTATION PURPOSES.

4000 2000 0 4000

CALE IN FEET

TerranearPMC

33006.90/11.14.05–DST/A202–1B

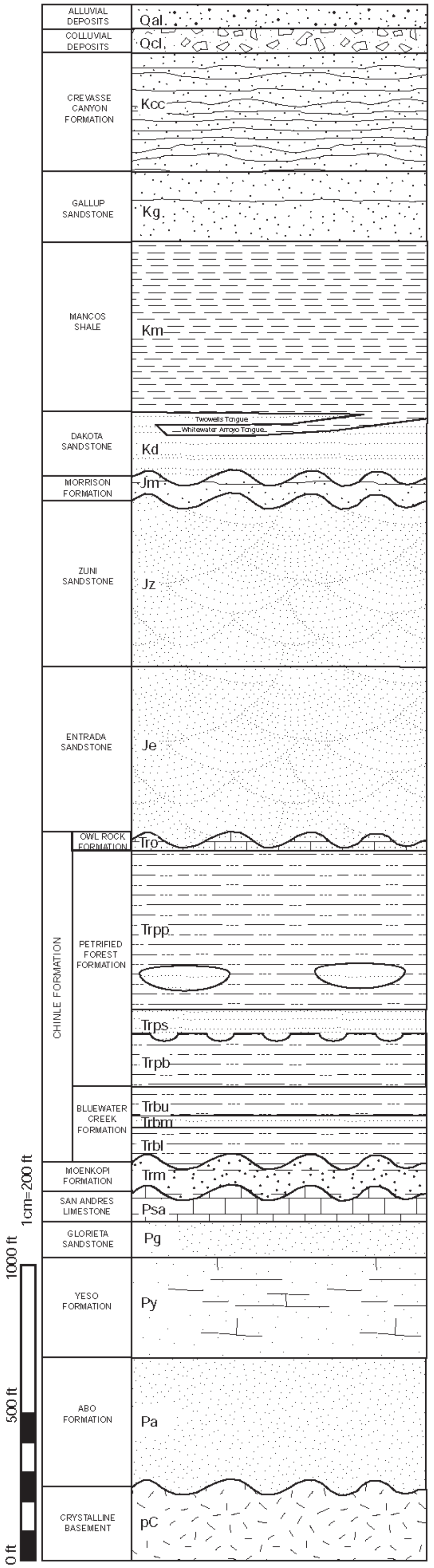


Figure 4
Stratigraphic Column
Fort Wingate Depot Activity
Gallup, New Mexico

Description of Units

Qal - Alluvial deposits (Quaternary); sand, gravel, and clay in young valleys and drainages

Qcl - Colluvial deposits (Quaternary); land-slides, and cobble deposits in young valleys and on steep slopes

Kcc - Crevasse Canyon Formation (Upper Cretaceus, 88 Ma); mudstone, shale, very fine- to medium-grained sandstone, carbonaceous shale, and thin lenticular coal beds; outcrops in southwest corner only; <400 feet thick

Kg - Gallup Sandstone (Upper Cretaceus, 90 Ma); tan to pale-orange, medium-grained, well-sorted calcareous-sandstone, silty-sandstone, and coaly-carbonaceous layers; three prominent ridge forming sandstone layers (<20') are separated by silty, and carbonaceous intervals (<80'); sandstone layers have only minor amounts of cement and minimal matrix material resulting in high apparent permeability; <220 feet thick

Km - Mancos Shale (Upper Middle Cretaceus, 97-90 Ma); light- to dark-gray and mudstone, silty-mudstone, and shale; minor amounts of lenticular sandy-siltstone, limestone, and calcerous-sandstone present in upper portions; sandy layers have abundant cement and ultrafine matrix resulting in very low apparent-permeability; the Whitewater Arroyo Tongue of the Mancos Shale is intertounged with and underlies the Twowells Tongue of the Dakota Sandstone, abundant fossil corrals and cephalopods in Whitewater Arroyo Tongue; <600 feet thick excluding the Whitewater Arroyo Tongue which varies in thickness from 0-80 feet thick

Kd - Dakota Sandstone (Upper Middle Cretaceus, 97-90 Ma); tan to pale-yellow, fine- to medium-grained, sub-angular to well-rounded, grain-supported sandstone; small amounts of matrix and grain-support result in a very high apparent-permeability; Twowells Tongue of Dakota Sandstone is intertongued with and overlies the Whitewater Arroyo Tongue of the Mancos Shale; basal contact of Dakota Sandstone unconformably overlies an irregular erosional surface developed in the Morrison Formation; <230-310 feet thick including the Whitewater Arroyo Tongue

Jm - Morrison Formation (Upper Jurassic, 160-145 Ma); grayish-white to pale-orange, subangular to well rounded, fine- to coarse-grained sandstone and conglomeratic-sandstone; trough cross stratification locally; clay-rich fine-grained intervals present near upper contact; highly variable apparent-permeability; variable thickness possibly due to bedding-plane slip along monoclinal fold axis; <65 feet thick in northern part of base, thinning to <20 feet to the south

Jz - Zuni Sandstone (Middle Jurassic, 170-165 Ma); white, pink, and reddish-orange, well-rounded, clast-supported, fine- to very-fine-grained sandstone and silty-sandstone; horizontal color banding common; crossbedding in relatively thin sets (compared to Entrada Sandstone); siltier intervals correlate to shallow slopes and cleaner interval correlate to steep slopes; very-high apparent-permeability; <620 feet thick

Je - Entrada Sandstone (Middle Jurassic, 170-165 Ma); red, and pinkish-gray, moderately rounded, matrix supported, fine- to medium-grained sandstone; large-scale crossbedding; less competent than Zuni Sandstone; calcareous cement; very-high apparent-permeability; <650 feet thick

Tro - Owl Rock Formation (Upper Triassic, 225-210 Ma); white, grayish-pink, and orange, crystalline-limestone, sandy-limestone, and calcerous-sandstone; variable thickness possibly due to bedding-plane slip along monoclinal fold axis; <30 feet thick

Trpp - Petrified Forest Formation, Painted Desert Member (Middle Triassic, 225-210 Ma); purplish-red, orangish-red and rust colored, mudstone, siltstone, sandstone, and sandstone-conglomerate; sandstone intervals (<20') have tabular and trough cross beds, abundant ultrafine matrix, and are generally dirty resulting in low apparent-permeability; abundant 1-2cm greenish gray calcrete nodules present forming a distinctive mottled or speckled surface; shallow (<6') channel deposits with intraformational conglomerates containing mudstone and carbonate clasts; lenticular bodies of sandstone with similar lithology to the Sonsela Sandstone are laterally discontinuous; <600 feet thick

Trps - Petrified Forest Formation, Sonsela Sandstone Member (Middle Triassic, 225-210 Ma); yellow, tan, and olive-colored, well rounded, clast-supported, medium- to coarse-grained sandstone and conglomeratic sandstone; conglomeratic intervals containing intraformational (mudstone, carbonate) and extraformational (chert, quartzite) clasts; thin crossbedding common; minimal matrix and grain-support result in very-high apparent-permeability; <100 feet thick, highly variable thickness typical of large-scale channel deposits

Trpb - Petrified Forest Formation, Blue Mesa Member (Middle Triassic, 230-225 Ma); purple, and purplish-red, mudstone, and muddy-sandstone; mudstones are smectitic; light-gray sandy-smectitic-siltstone interval (<8') serves as marker bed for the base of the Petrified Forest Formation; high quantity of ultrafine matrix results in a very-low apparent-permeability; petrified wood very common in upper portions; <280 feet thick

Trbu - Bluewater Creek Formation, Upper Member (Upper Triassic, 230-225 Ma); pinkish-gray to reddish-brown siltstone and mudstone; calcrete nodules present locally; high silt and ultrafine matrix result in low apparent-permeability; <100 feet thick

Trbm - Bluewater Creek Formation, McGaffey Member (Upper Triassic, 230-225 Ma); white, pale-red and gray, medium-grained, ripple-laminated sandstone; color banding common; basal interval has carbonate-clast-conglomerate; calcareous cement; high apparent-permeability; <80 feet thick, highly variable thickness typical of large-scale channel deposits, locally not recognized

Trbl - Bluewater Creek Formation, Lower Member (Middle to Upper Triassic, 240-225 Ma); yellowish-gray, and reddish-brown mudstone and siltstone; calcrete nodules are present locally; low apparent-permeability; <115 feet thick

Trm - Shinarump Formation and Moenkopi Formation Undivided (Middle Triassic, 240-225 Ma); Shinarump Formation is purple and reddish-gray, motled chert- and quartzite-pebble-conglomerate and congloeratic-sandstone with reddish-brown matrix; Moenkopi is red, tan, and black calcareous-mottled-sandstone and calcareous-mudstone; massive to thinly-laminated and ripple-laminated siltstone and very fine-grained sandstones; 30-200 feet thick combined

Psa - San Andres Limestone (Middle Permian, 275-250 Ma); gray and white, fossiliferous, crystalline-limestone and dolomitic-limestone; locally absent due to karsting; <165 feet thick

Pg - Glorieta Sandstone (280-275 Ma); grayish-orange to orange, well-sorted, moderate- to well-rounded, fine- to medium-grained quartzose-sandstone; horizontal and low-angle crossbedding locally; <130 feet thick

Py - Yeso Formation (280-275 Ma); dark-orange to reddish-orange, very fine-grained gypsiferous-sandstone and silty-sandstone; three light-gray, dolomitic, carbonate beds (7') present in formation; <375 feet thick

Pa - Abo Formation (280-275 Ma); grayish-red, very fine-grained silty-sandstone; non-calcerous; flat-bedded; basal 3-12' are arkosic; <450 feet thick

pC - Precambrian Basement; typically granitic- to dioritic- igneous and metamorphic rocks

Reference: Thorstenson, D.J., and Beard, L.S., U.S. Geological Survey, 2000.

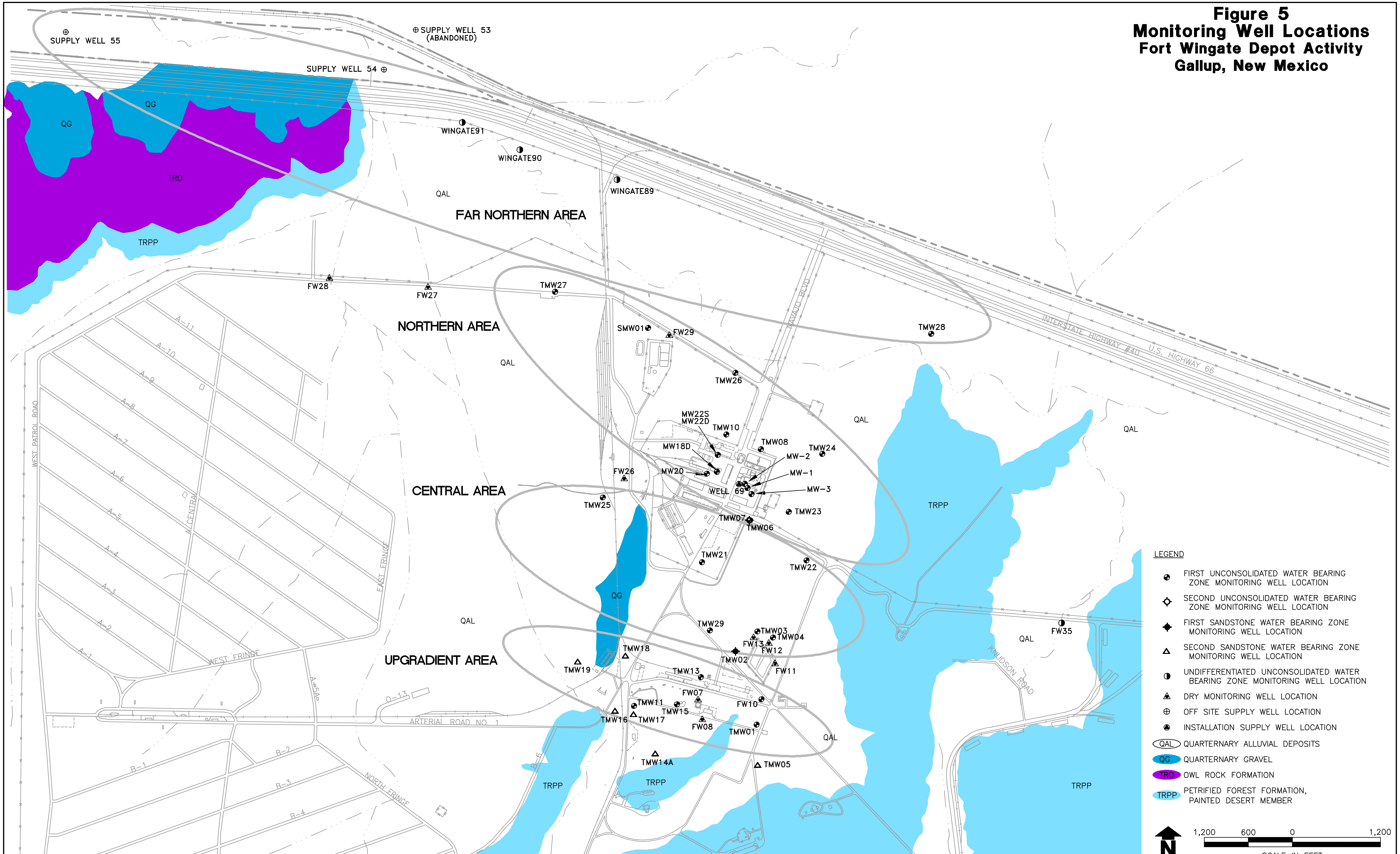
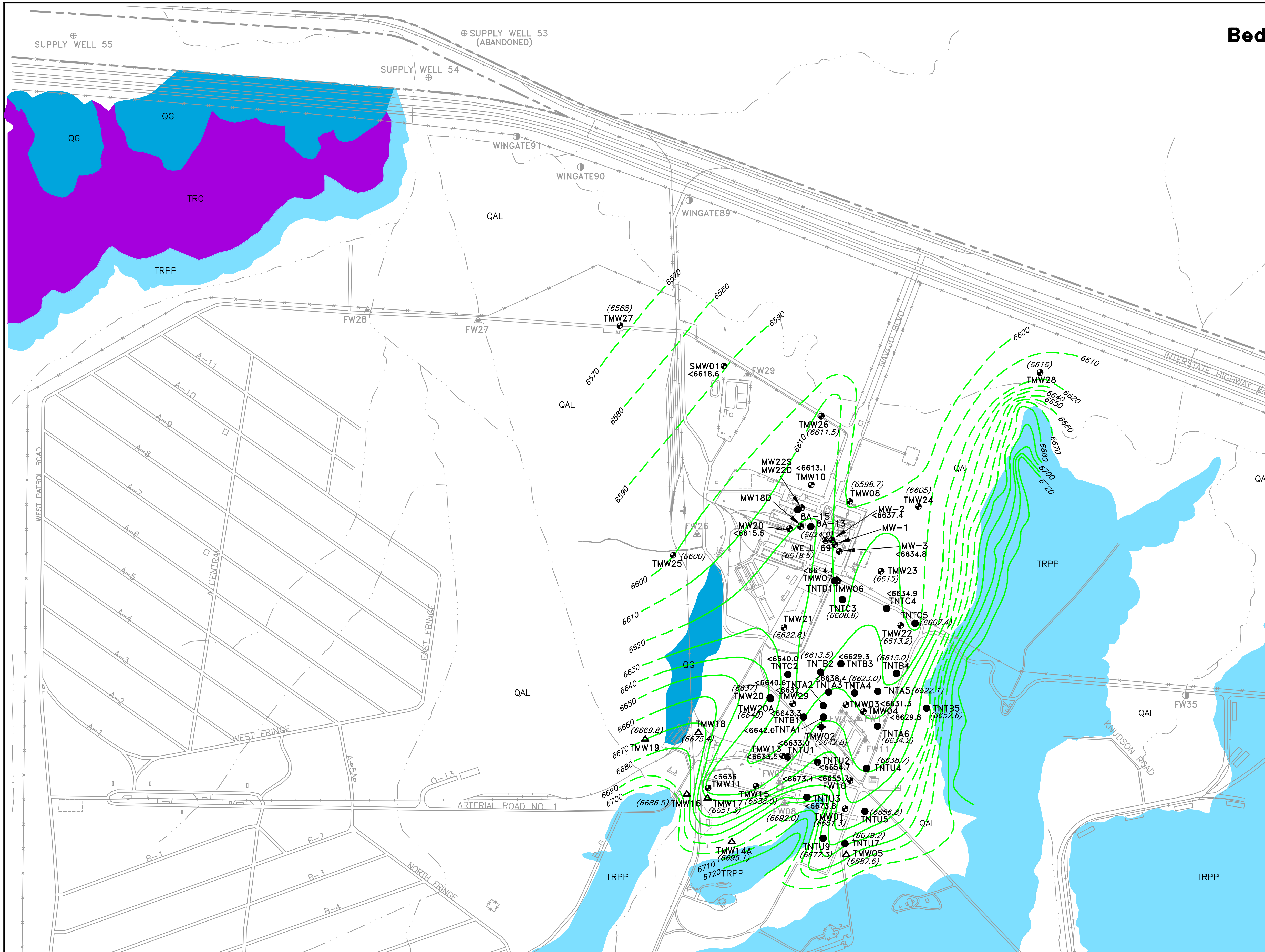


Figure 5
Monitoring Well Locations
Fort Wingate Depot Activity
Gallup, New Mexico
FAR NORTHERN AREA
NORTHERN AREA
CENTRAL AREA
UPGRADIENT AREA
LEGEND
FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
DRY MONITORING WELL LOCATION
OFF SITE SUPPLY WELL LOCATION
INSTALLATION SUPPLY WELL LOCATION
QAL QUARTERNARY ALLUVIAL DEPOSITS
QG QUARTERNARY GRAVEL
TRO OWL ROCK FORMATION
TRPP PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER
1,200 600 0 1,200
SCALE IN FEET
N

Figure 6
Bedrock Surface Elevation Map
Fort Wingate Depot Activity
Gallup, New Mexico



LEGEND

- FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
- SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
- FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
- SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
- UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
- DRY MONITORING WELL LOCATION
- OFF SITE SUPPLY WELL LOCATION
- INSTALLATION SUPPLY WELL LOCATION
- BORING LOCATION
- BEDROCK SURFACE ELEVATION CONTOUR (INTERVAL 10 FEET) (DASHED WHERE INFERRED)
- (6568) BEDROCK SURFACE ELEVATION
- <6638.4 BEDROCK SURFACE NOT ENCOUNTERED
- QAL QUARTERNARY ALLUVIAL DEPOSITS
- QG QUARTERNARY GRAVEL
- TRO OWL ROCK FORMATION
- TRPP PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER BEDROCK OUTCROP

N

1,200 600 0 1,200
SCALE IN FEET

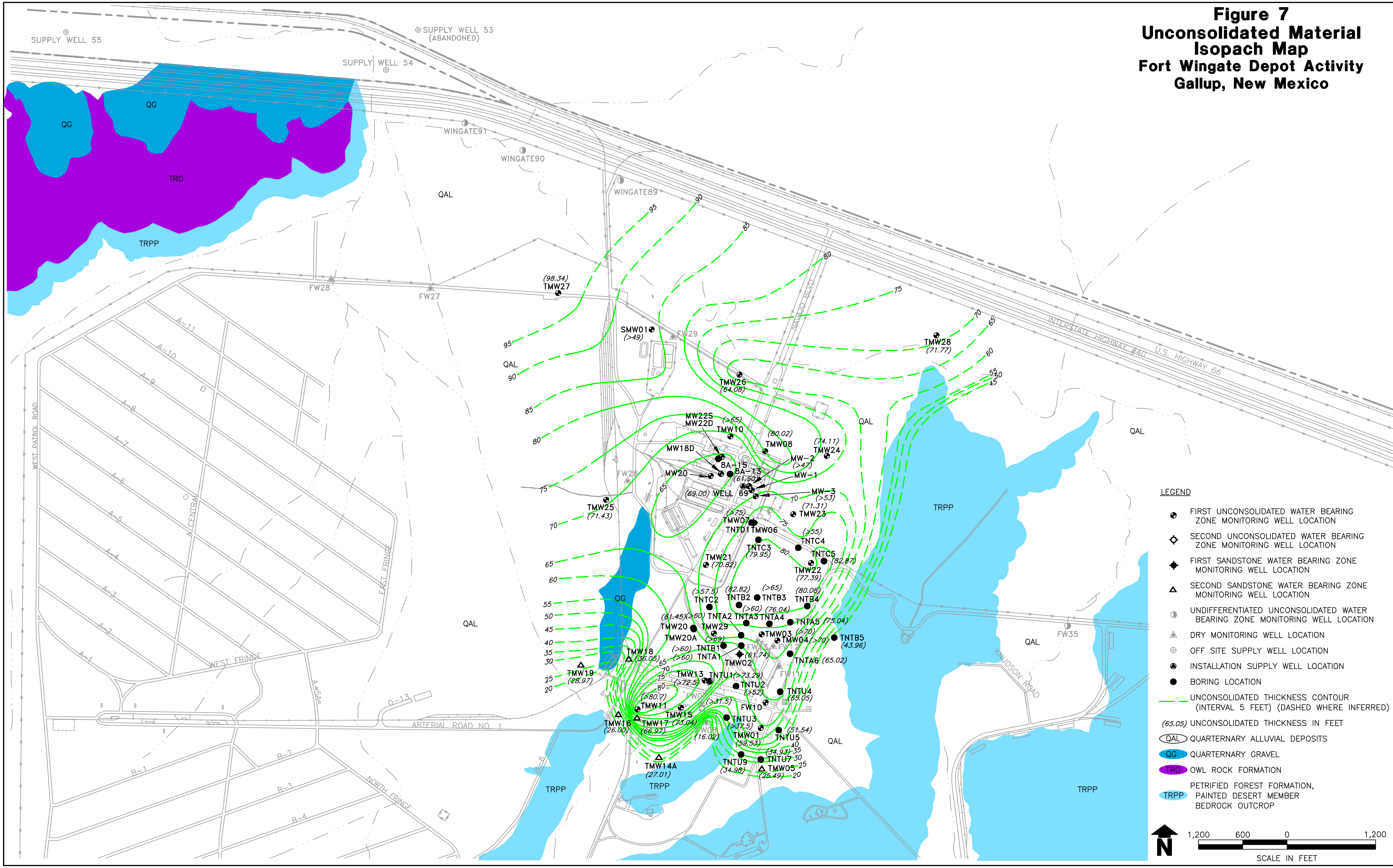
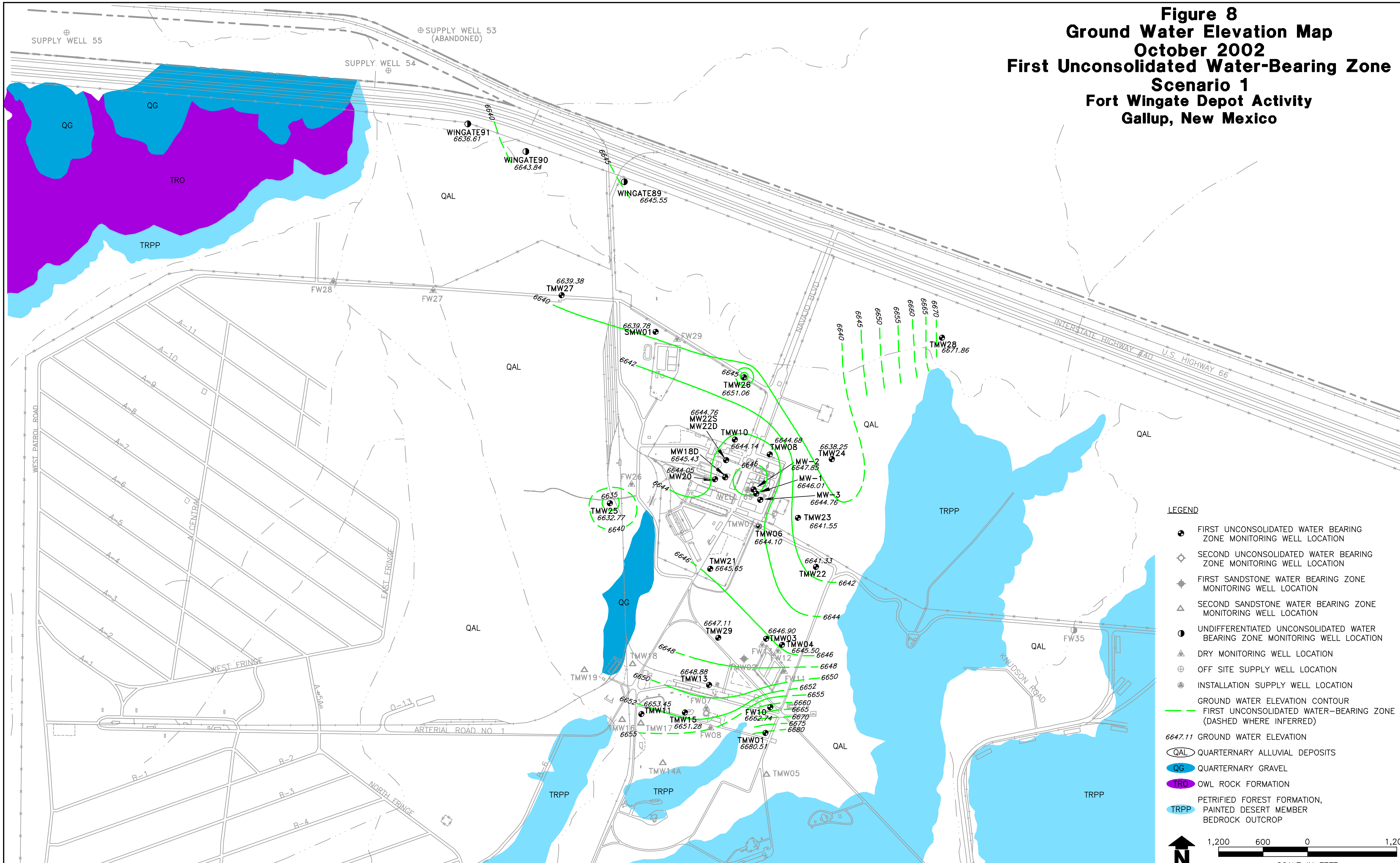


Figure 7
Unconsolidated Material
Isopach Map
Fort Wingate Depot Activity
Gallup, New Mexico
LEGEND
FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
DRY MONITORING WELL LOCATION
OFF SITE SUPPLY WELL LOCATION
INSTALLATION SUPPLY WELL LOCATION
BORING LOCATION
UNCONSOLIDATED THICKNESS CONTOUR (INTERVAL 5 FEET) (DASHED WHERE INFERRED)
(65.05) UNCONSOLIDATED THICKNESS IN FEET
QAL QUARTERNARY ALLUVIAL DEPOSITS
QG QUARTERNARY GRAVEL
TRO OWL ROCK FORMATION
TRPP PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER BEDROCK OUTCROP
N
1,200 600 0 1,200
SCALE IN FEET
SUPPLY WELL 55
SUPPLY WELL 53 (ABANDONED)
SUPPLY WELL 54
WINGATE91
WINGATE90
WINGATE89
INTERSTATE HIGHWAY #40
U.S. HIGHWAY 66
WEST PATROL ROAD
ARTERIAL ROAD NO. 1
KNUDSON ROAD
NORTH FRINGE
WEST FRINGE
EAST FRINGE
(98.34) TMW27
SMW01 (>49)
TMW28 (71.77)
TMW26 (64.08)
TMW25 (71.43)
TMW19 (28.97)
TMW18 (36.05)
TMW16 (26.00)
TMW17 (66.97)
TMW14A (27.01)
TMW05 (25.49)
TNTB5 (43.96)
TNTA6 (65.02)
TNTU4 (65.05)
TMW21 (70.82)
TMW22 (77.39)
TMW23 (71.31)
TMW24 (74.11)
TMW08 (80.02)
(69.00) WELL 69

Figure 8
Ground Water Elevation Map
October 2002
First Unconsolidated Water-Bearing Zone
Scenario 1
Fort Wingate Depot Activity
Gallup, New Mexico



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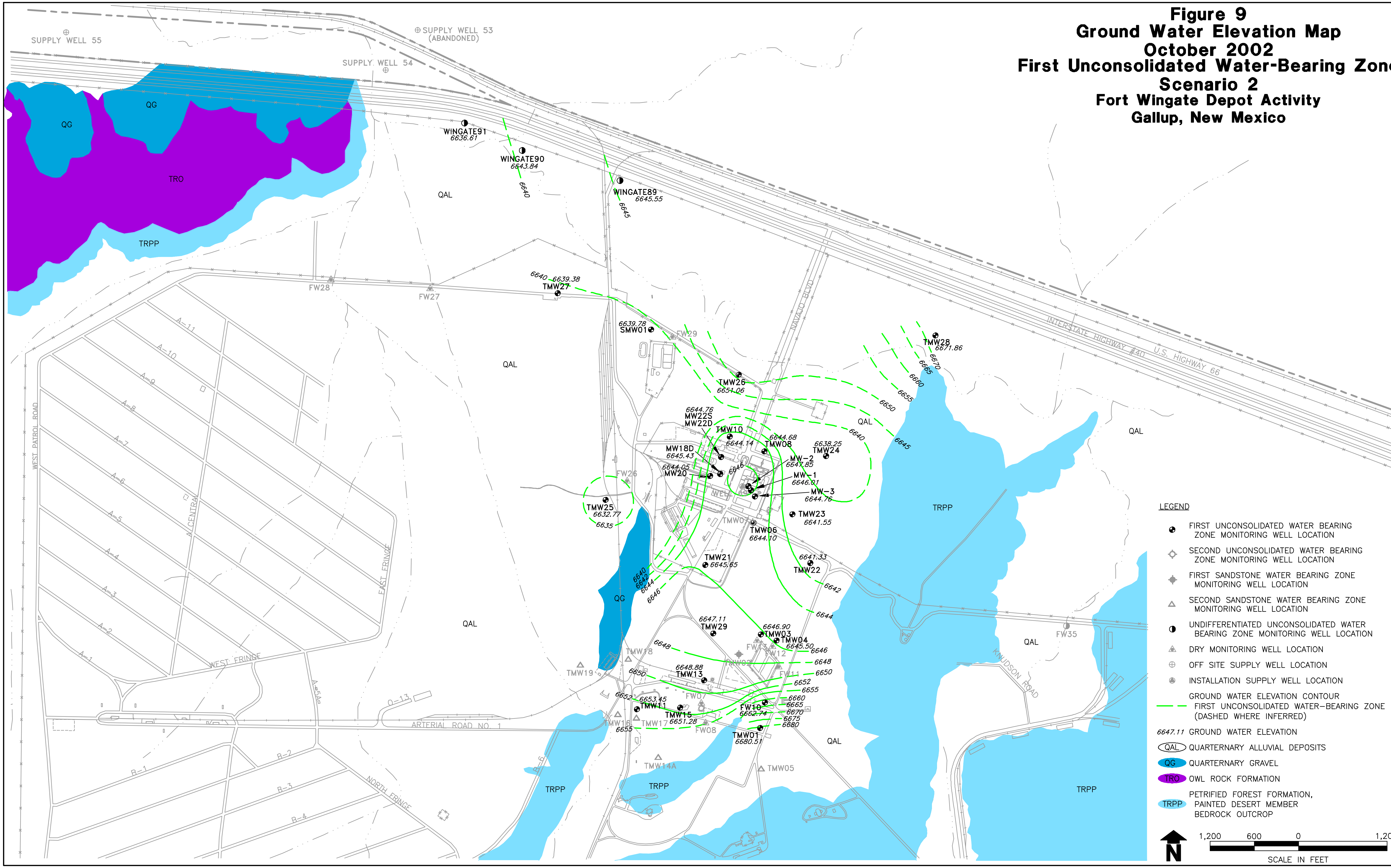


Figure 9
Ground Water Elevation Map
October 2002
First Unconsolidated Water-Bearing Zone
Scenario 2
Fort Wingate Depot Activity
Gallup, New Mexico
LEGEND
FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
DRY MONITORING WELL LOCATION
OFF SITE SUPPLY WELL LOCATION
INSTALLATION SUPPLY WELL LOCATION
GROUND WATER ELEVATION CONTOUR FIRST UNCONSOLIDATED WATER-BEARING ZONE (DASHED WHERE INFERRED)
6647.11 GROUND WATER ELEVATION
QAL QUARTERNARY ALLUVIAL DEPOSITS
QG QUARTERNARY GRAVEL
TRO OWL ROCK FORMATION
TRPP PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER BEDROCK OUTCROP
1,200 600 0 1,200
SCALE IN FEET
N
SUPPLY WELL 55
SUPPLY WELL 54
SUPPLY WELL 53 (ABANDONED)
INTERSTATE HIGHWAY #40
U.S. HIGHWAY 66
WINGATE91 6636.61
WINGATE90 6643.84
WINGATE89 6645.55
TMW27 6639.38
SMW01 6639.78
TMW26 6651.06
TMW28 6671.86
MW22S MW22D 6644.76
TMW10 6644.14
TMW08 6644.68
TMW24 6638.25
MW18D 6645.43
MW20 6644.05
MW-2 6647.85
MW-1 6646.01
MW-3 6644.76
TMW25 6632.77
TMW23 6641.55
TMW06 6644.10
TMW21 6645.65
TMW22 6641.33
TMW29 6647.11
TMW03 6646.90
TMW04 6645.50
TMW13 6648.88
TMW11 6653.45
TMW15 6651.28
FW10 6662.74
TMW01 6680.51
WEST PATROL ROAD
WEST FRINGE
EAST FRINGE
NORTH FRINGE
CENTRAL
ARTERIAL ROAD NO. 1
NAVAJO BLVD
KNUDSON ROAD

Figure 10
Ground Water Elevation Map
April 2003
First Unconsolidated Water-Bearing Zone
Scenario 1
Fort Wingate Depot Activity
Gallup, New Mexico

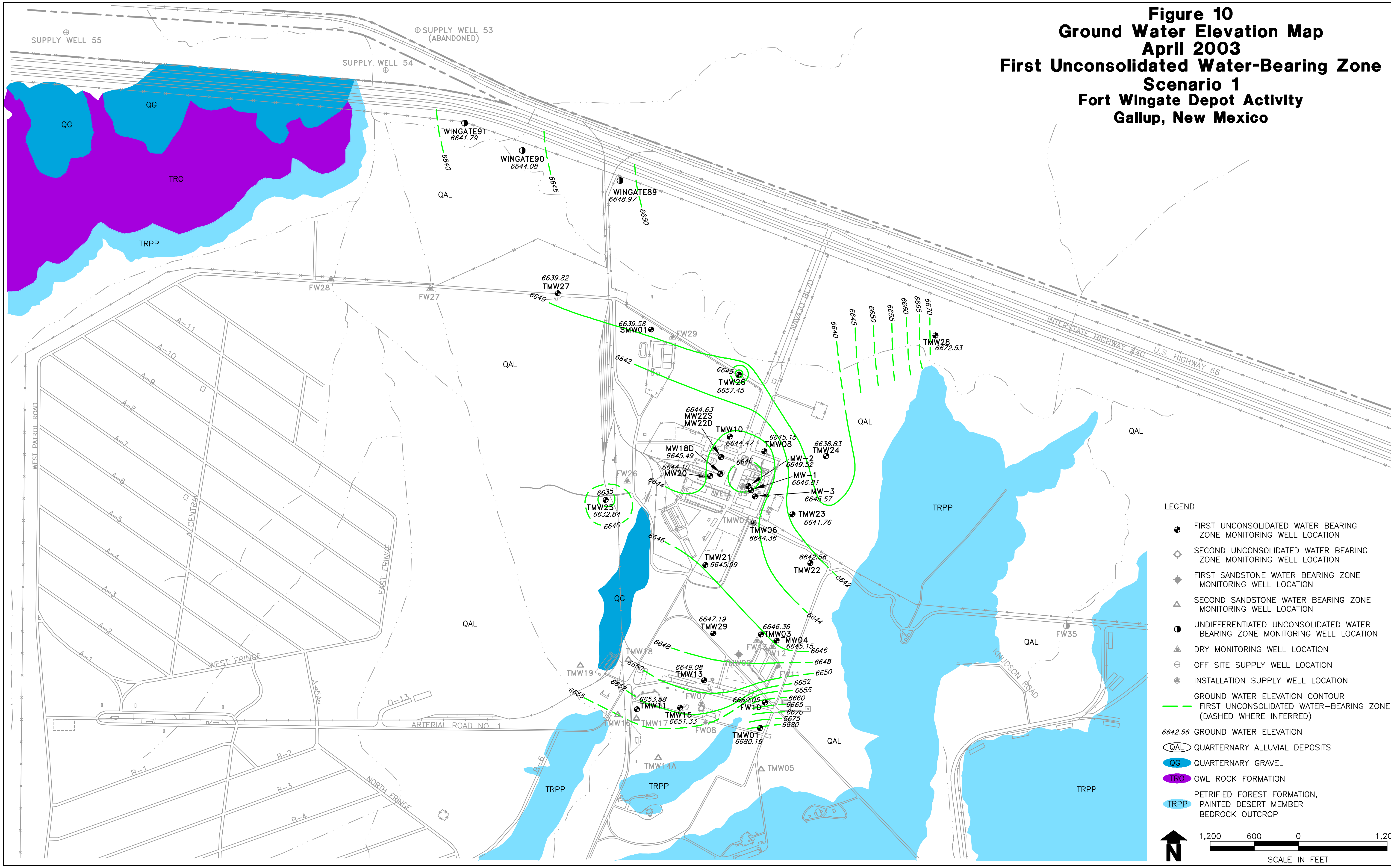
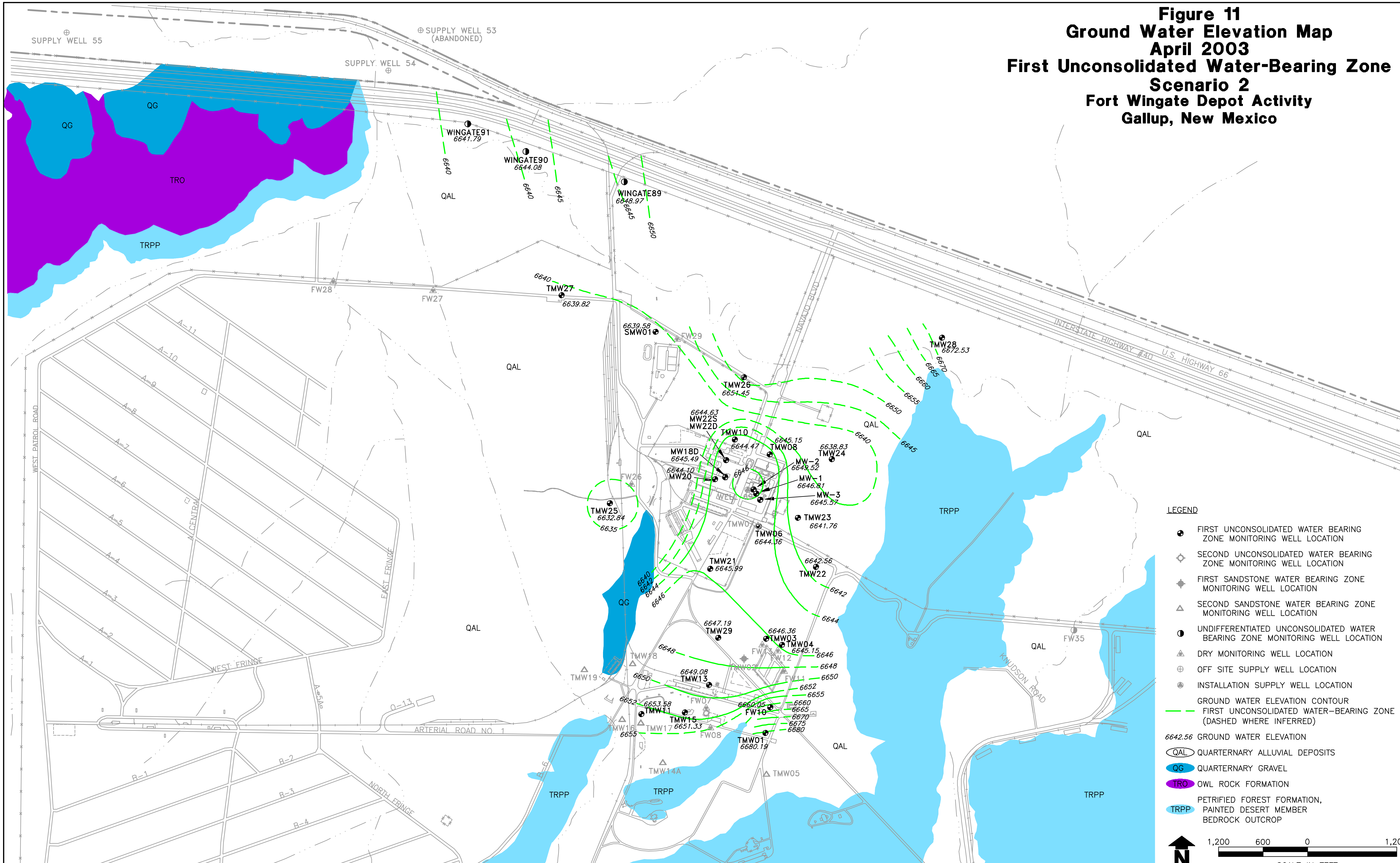
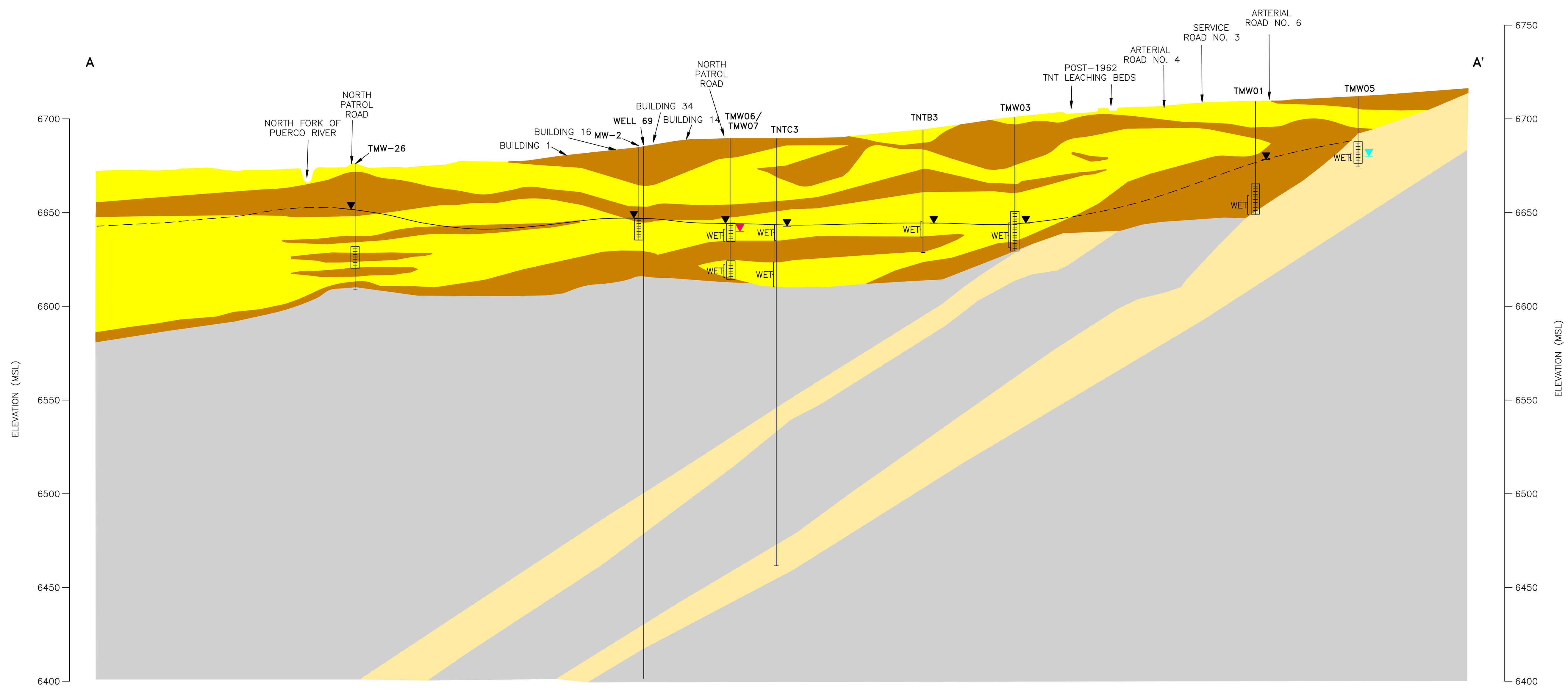
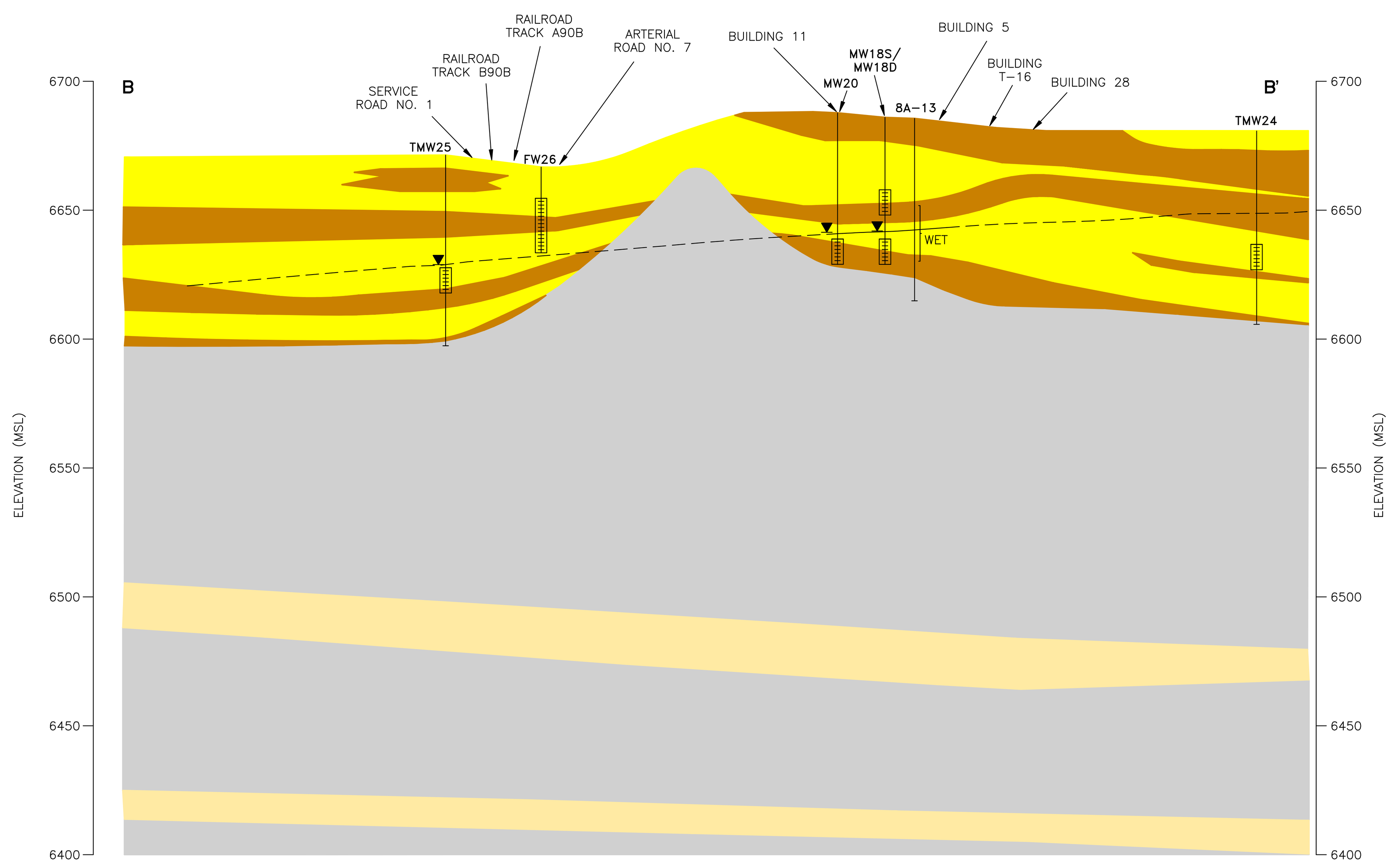
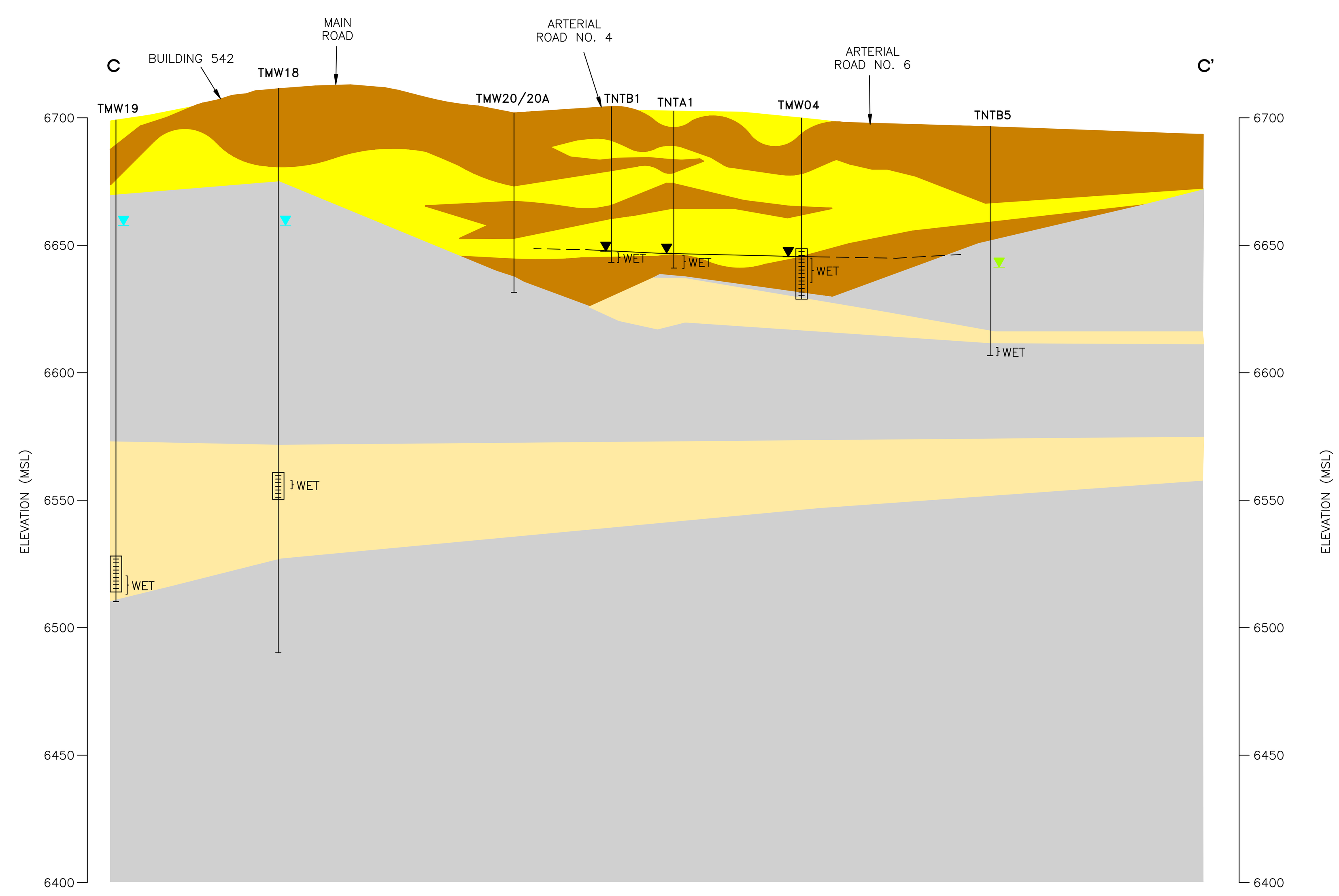


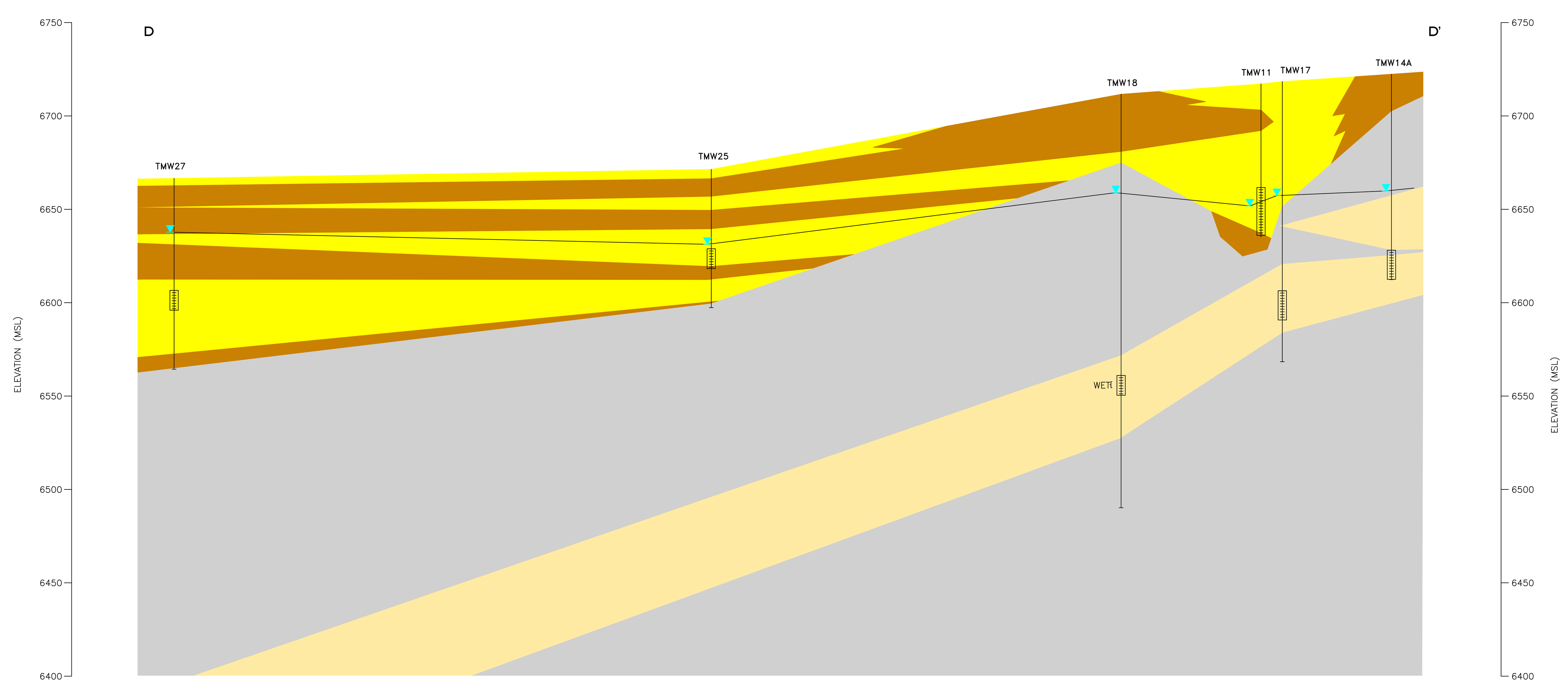
Figure 11
Ground Water Elevation Map
April 2003
First Unconsolidated Water-Bearing Zone
Scenario 2
Fort Wingate Depot Activity
Gallup, New Mexico

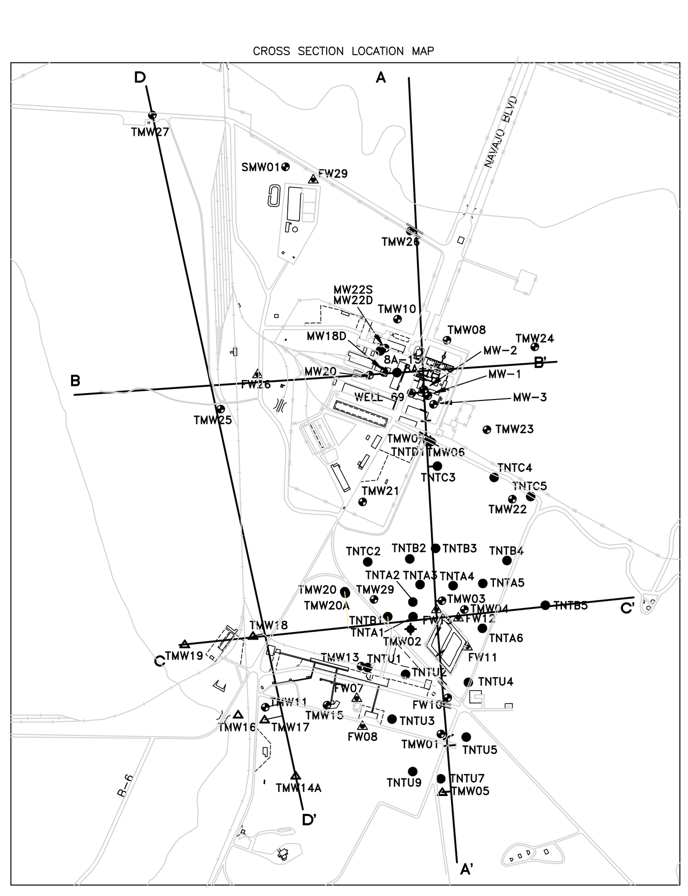












LEGEND

- FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
- SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
- FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
- SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
- UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
- DRY MONITORING WELL LOCATION
- OFF SITE SUPPLY WELL LOCATION
- INSTALLATION SUPPLY WELL LOCATION
- BORING LOCATION

N

1,200 600 0 1,200

SCALE IN FEET

LEGEND

- SAND (SILTY SAND, CLAYEY SAND, AND SAND)
- CLAY (SANDY CLAY, SILTY CLAY, CLAYEY SILT, AND SILT)
- SANDSTONE (SANDSTONE, SILTY SANDSTONE, AND CONGLOMERATE)
- CLAYSTONE (CLAYSTONE, MUDSTONE, AND SILTSTONE)
- STATIC WATER ELEVATION – 1ST UNCONSOLIDATED WATER-BEARING ZONE
- STATIC WATER ELEVATION – 2ND UNCONSOLIDATED WATER-BEARING ZONE
- STATIC WATER ELEVATION – 2ND SANDSTONE WATER-BEARING ZONE
- STATIC WATER ELEVATION – INTERMEDIATE SANDSTONE WATER-BEARING ZONE

VERTICAL EXAGGERATION = 10X

400 200 0 400 800

SCALE IN FEET

REV. NO.	DATE	DESCRIPTION OF REVISION	REV. BY	ENG	CHKD BY	APPVD BY

PROJECT MANAGER: S. DEETER | DRAWN BY: D. TAYLOR | DATE: 11.14.05

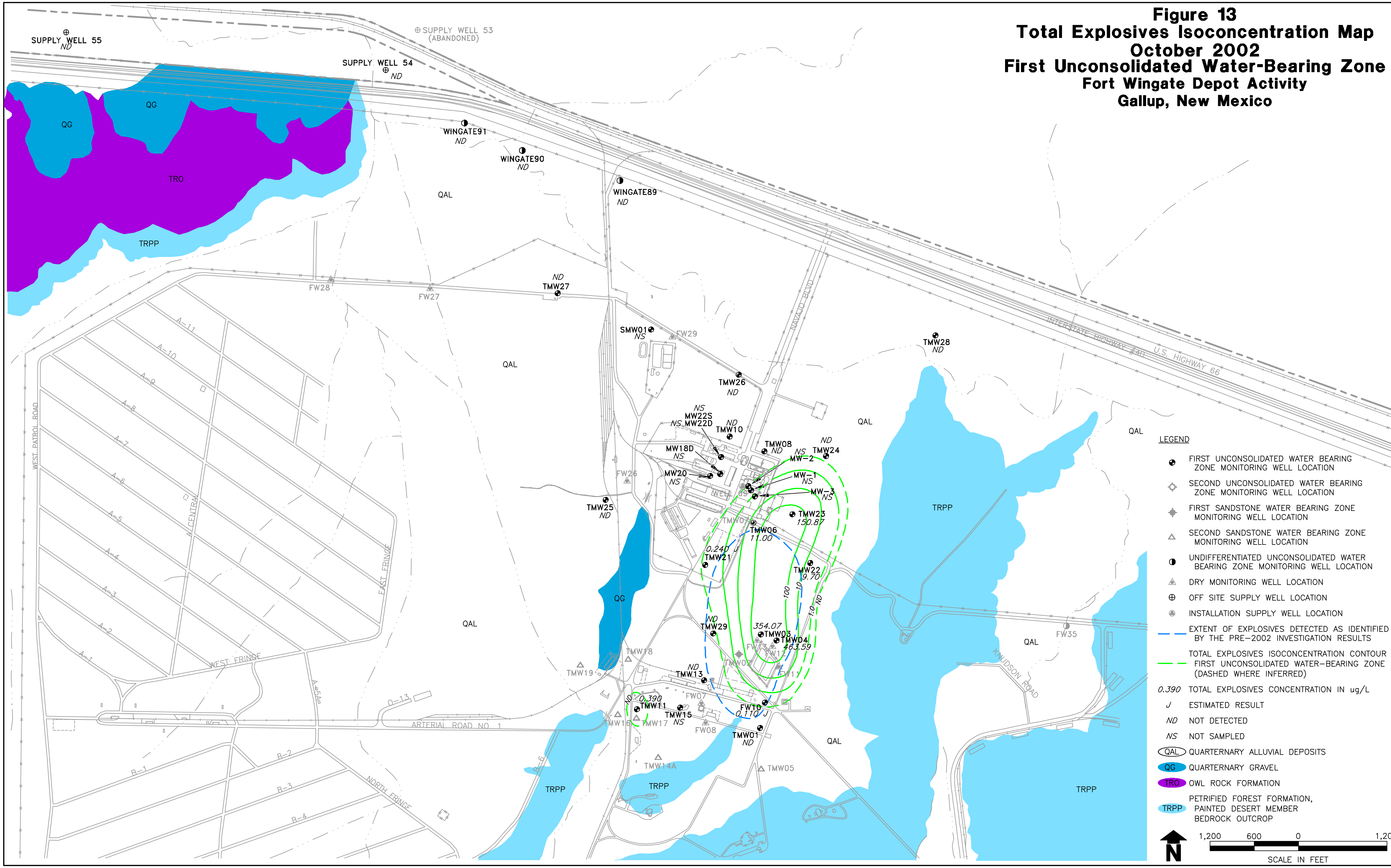
TerranearPMC
WHITELAND BUSINESS PARK
835 SPRINGDALE DRIVE, SUITE 201
EXTON, PA 19341-2843
(610) 862-5000 PHONE
(610) 862-5050 FAX

Figure 12
Cross Sections A-A', B-B', C-C', and D-D'

Fort Wingate Depot Activity
Gallup, New Mexico
United States Army
Tooele Army Depot, Utah

PROJECT NO.	FILE NO.	CHKD:	DRAWING NUMBER	REV. NO.
33006		ENG.	90E401	0
		APPVD:	SCALE: 1" = 400'	

Figure 13
Total Explosives Isoconcentration Map
October 2002
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico



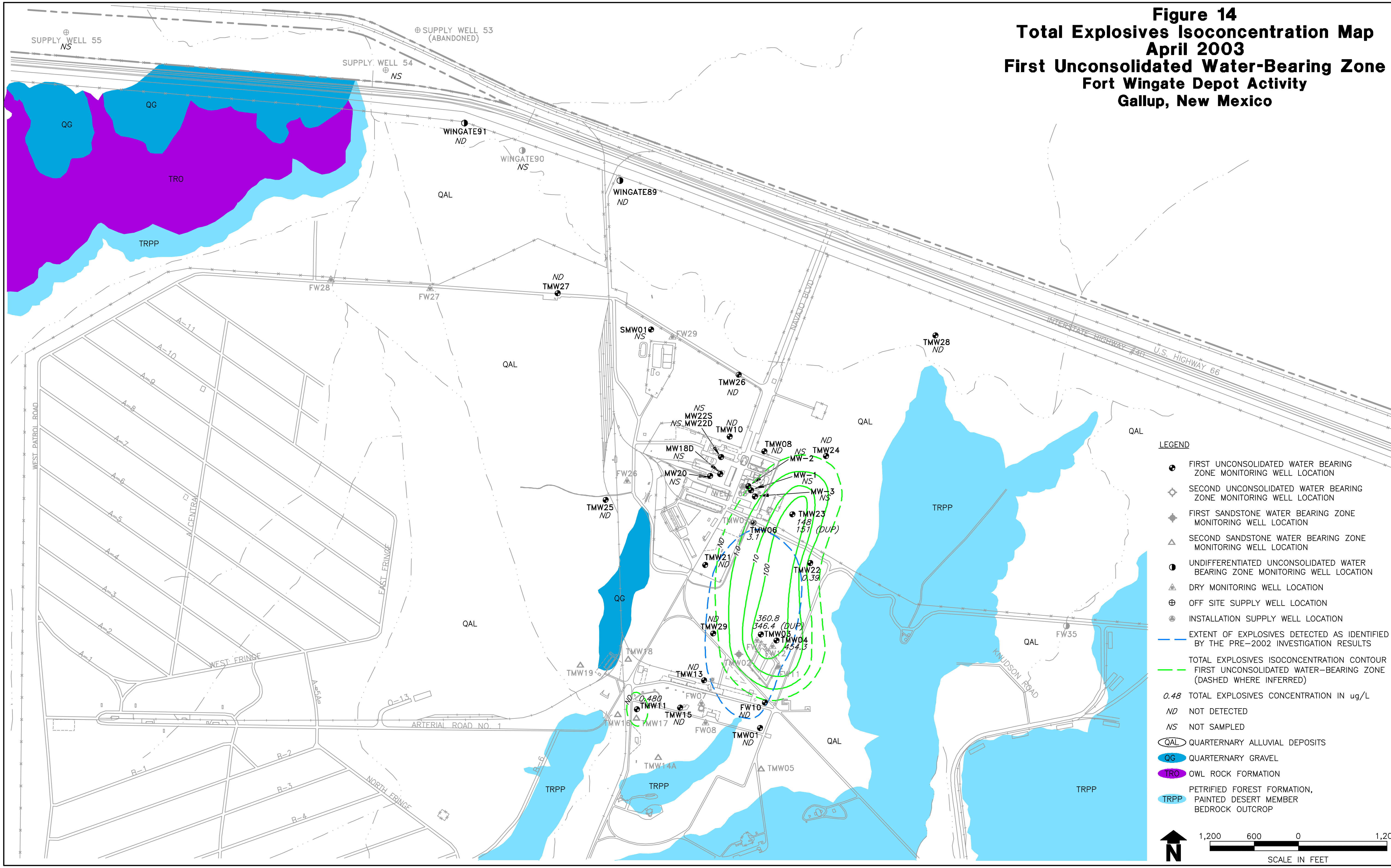
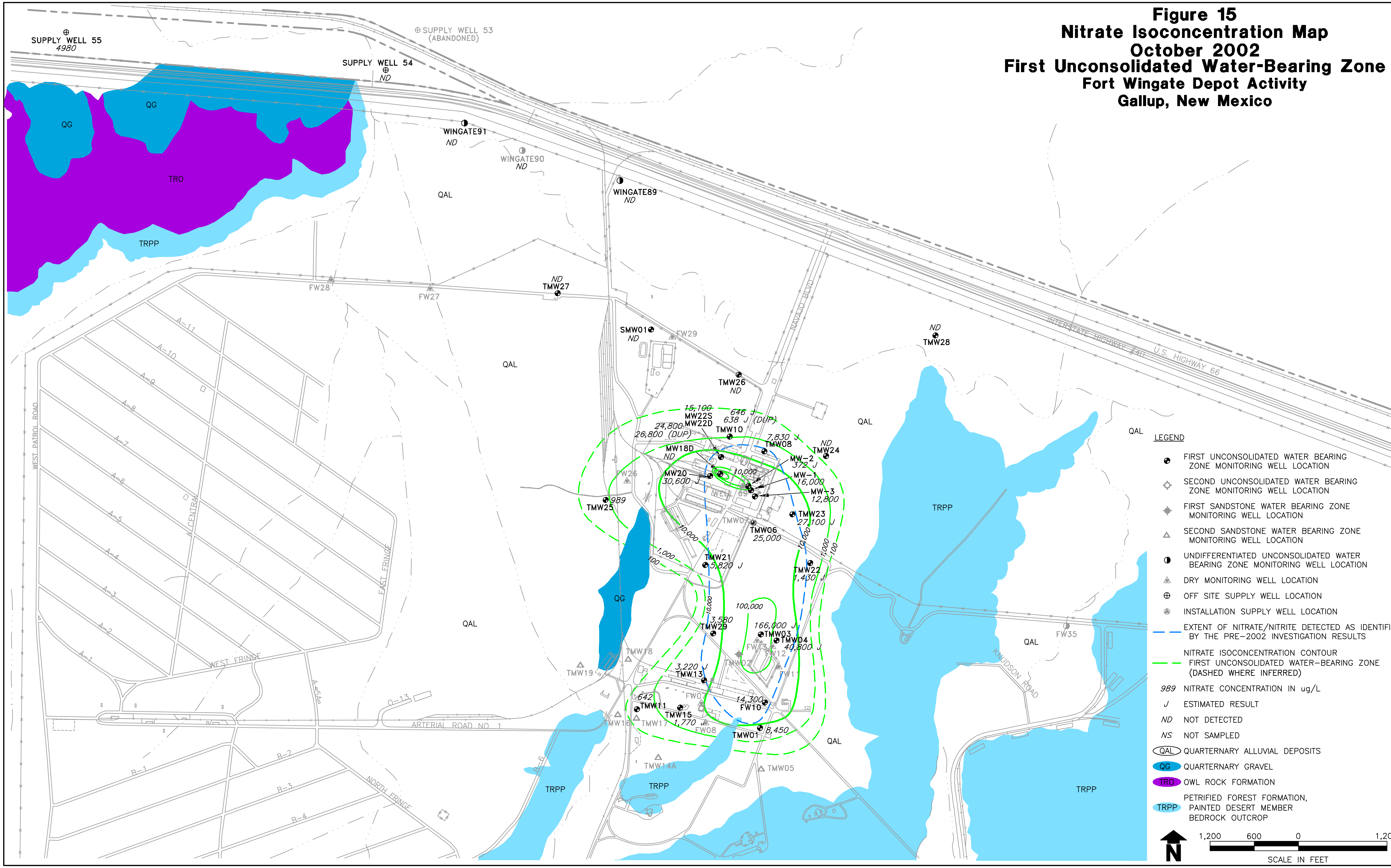


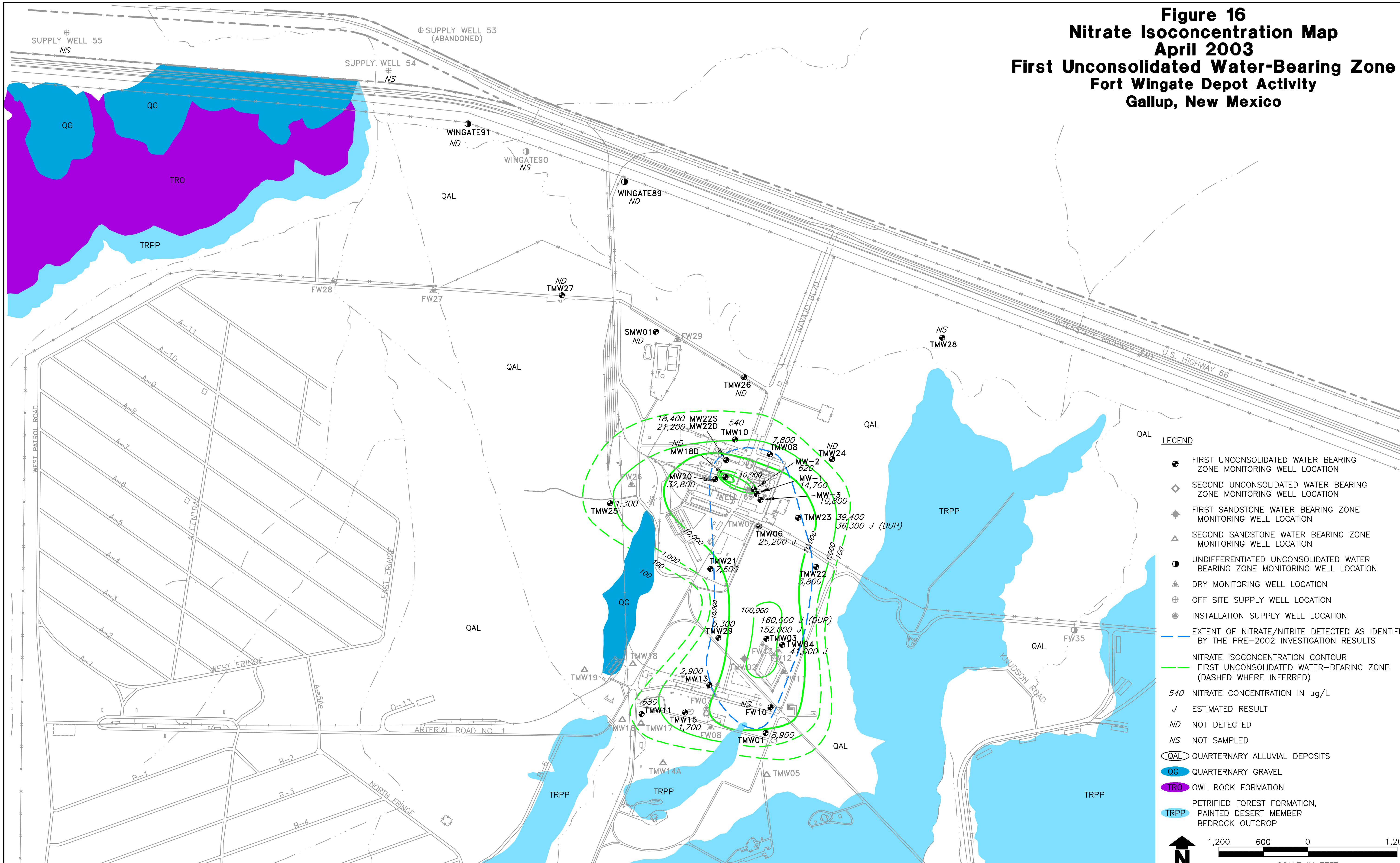
Figure 14
Total Explosives Isoconcentration Map
April 2003
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico
LEGEND
FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
DRY MONITORING WELL LOCATION
OFF SITE SUPPLY WELL LOCATION
INSTALLATION SUPPLY WELL LOCATION
EXTENT OF EXPLOSIVES DETECTED AS IDENTIFIED BY THE PRE-2002 INVESTIGATION RESULTS
TOTAL EXPLOSIVES ISOCONCENTRATION CONTOUR FIRST UNCONSOLIDATED WATER-BEARING ZONE (DASHED WHERE INFERRED)
0.48 TOTAL EXPLOSIVES CONCENTRATION IN ug/L
ND NOT DETECTED
NS NOT SAMPLED
QAL QUATERNARY ALLUVIAL DEPOSITS
QG QUATERNARY GRAVEL
TRO OWL ROCK FORMATION
TRPP PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER BEDROCK OUTCROP
1,200 600 0 1,200
SCALE IN FEET
N
SUPPLY WELL 55
NS
SUPPLY WELL 54
NS
SUPPLY WELL 53 (ABANDONED)
WINGATE91
ND
WINGATE90
NS
WINGATE89
ND
TMW27
ND
SMW01
NS
TMW26
ND
TMW28
ND
TMW10
ND
MW22S
MW22D
NS
MW18D
NS
MW20
NS
TMW08
ND
TMW24
ND
MW-2
MW-1
NS
MW-3
NS
TMW25
ND
TMW23
148
151 (DUP)
TMW06
3.1
TMW21
ND
TMW22
0.39
TMW29
ND
360.8
346.4 (DUP)
TMW03
TMW04
454.3
TMW13
ND
TMW11
0.480
TMW15
ND
FW10
ND
TMW01
ND
TMW05
TMW14A
TMW16
TMW17
TMW18
TMW19
FW26
FW27
FW28
FW29
FW35
FW07
FW08
10
100
INTERSTATE HIGHWAY 40
U.S. HIGHWAY 66
NAVAJO BLVD
KNUDSON ROAD
ARTERIAL ROAD NO. 1
WEST PATROL ROAD
WEST FRINGE
EAST FRINGE
NORTH FRINGE
QAL
QG
TRO
TRPP



TerranearPMC

33006.90/11.15.05-DST/I203-4C

Figure 16
Nitrate Isoconcentration Map
April 2003
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico



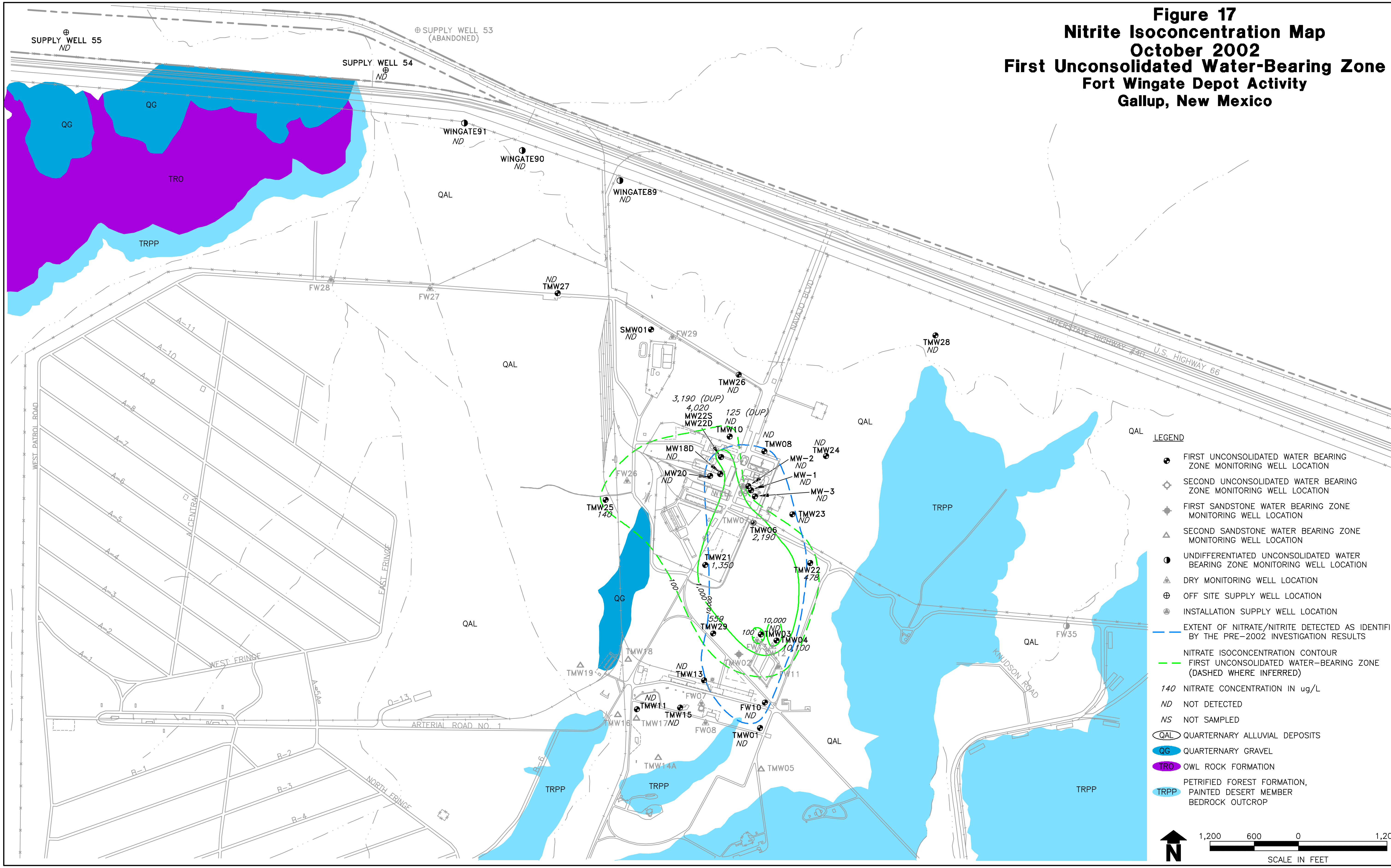


Figure 17
Nitrite Isoconcentration Map
October 2002
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico
SUPPLY WELL 55
ND
SUPPLY WELL 54
ND
SUPPLY WELL 53
(ABANDONED)
WINGATE91
ND
WINGATE90
ND
WINGATE89
ND
QG
TRO
TRPP
QAL
FW28
FW27
ND
TMW27
SMW01
ND
FW29
TMW26
ND
3,190 (DUP)
4,020
MW22S
MW22D
125 (DUP)
ND
TMW10
ND
TMW08
ND
TMW24
MW18D
ND
MW-2
ND
MW20
ND
MW-1
ND
MW-3
ND
FW26
TMW25
140
TMW07
TMW23
ND
TMW06
2,190
TMW21
1,350
TMW22
478
100
10,000
559
TMW29
10,000
100
ND
TMW03
TMW04
10,100
TMW18
TMW19
ND
TMW13
TMW02
TW11
ND
TMW11
TMW15
ND
FW07
FW10
ND
TMW16
TMW17
FW08
TMW01
ND
TMW14A
TMW05
FW35
NAVAJO BLVD
INTERSTATE HIGHWAY I-40
U.S. HIGHWAY 66
WEST PATROL ROAD
CENTRAL
EAST FRINGE
WEST FRINGE
ARTERIAL ROAD NO. 1
NORTH FRINGE
KNUDSON ROAD
A-11
A-10
A-9
A-8
A-7
A-6
A-5
A-4
A-3
A-2
A-1
B-1
B-2
B-3
B-4
LEGEND
FIRST UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
SECOND UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
FIRST SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
SECOND SANDSTONE WATER BEARING ZONE MONITORING WELL LOCATION
UNDIFFERENTIATED UNCONSOLIDATED WATER BEARING ZONE MONITORING WELL LOCATION
DRY MONITORING WELL LOCATION
OFF SITE SUPPLY WELL LOCATION
INSTALLATION SUPPLY WELL LOCATION
EXTENT OF NITRATE/NITRITE DETECTED AS IDENTIFIED BY THE PRE-2002 INVESTIGATION RESULTS
NITRATE ISOCONCENTRATION CONTOUR FIRST UNCONSOLIDATED WATER-BEARING ZONE (DASHED WHERE INFERRED)
140 NITRATE CONCENTRATION IN ug/L
ND NOT DETECTED
NS NOT SAMPLED
QAL QUARTERNARY ALLUVIAL DEPOSITS
QG QUARTERNARY GRAVEL
TRO OWL ROCK FORMATION
TRPP PETRIFIED FOREST FORMATION, PAINTED DESERT MEMBER BEDROCK OUTCROP
1,200
600
0
1,200
SCALE IN FEET
N

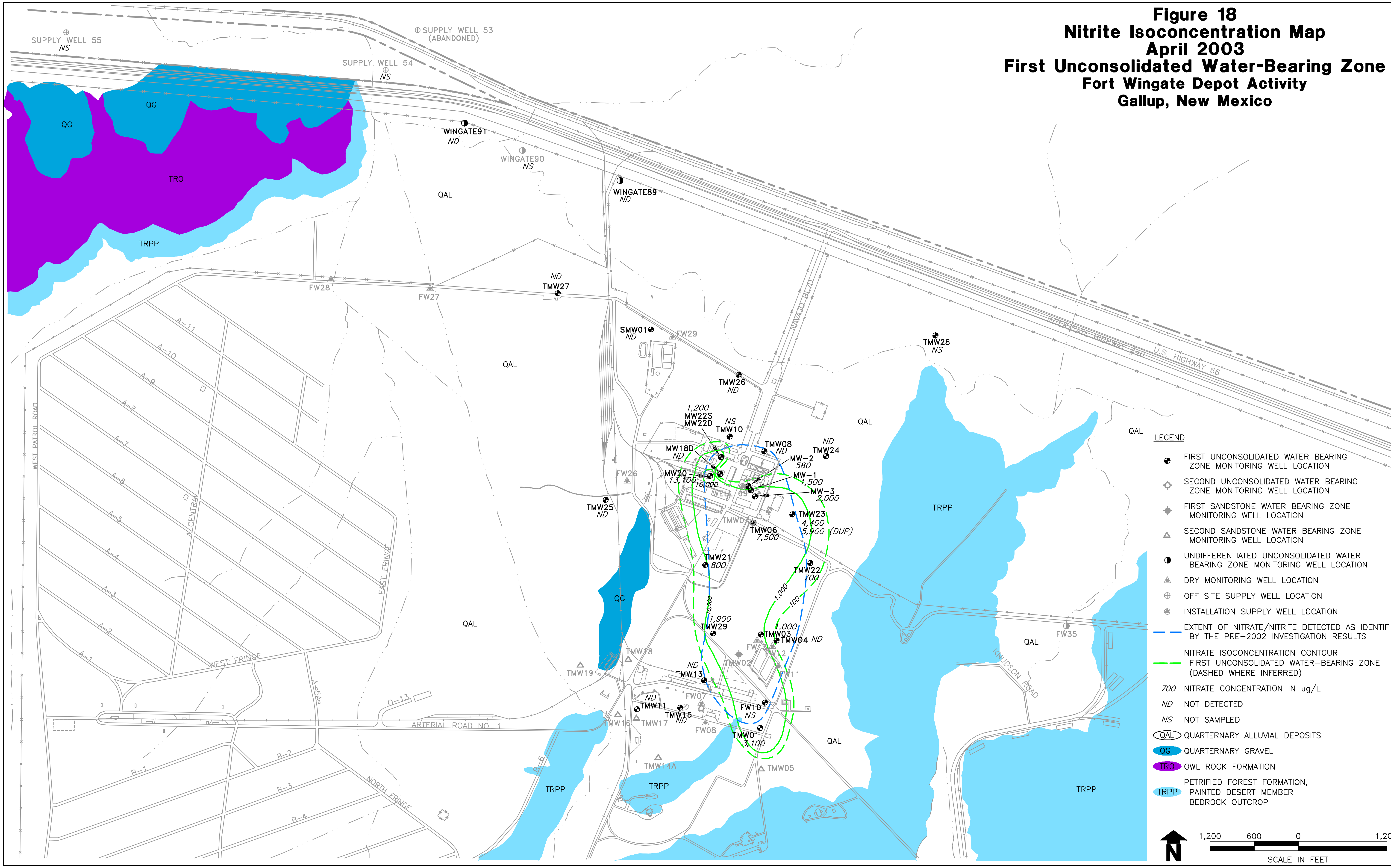
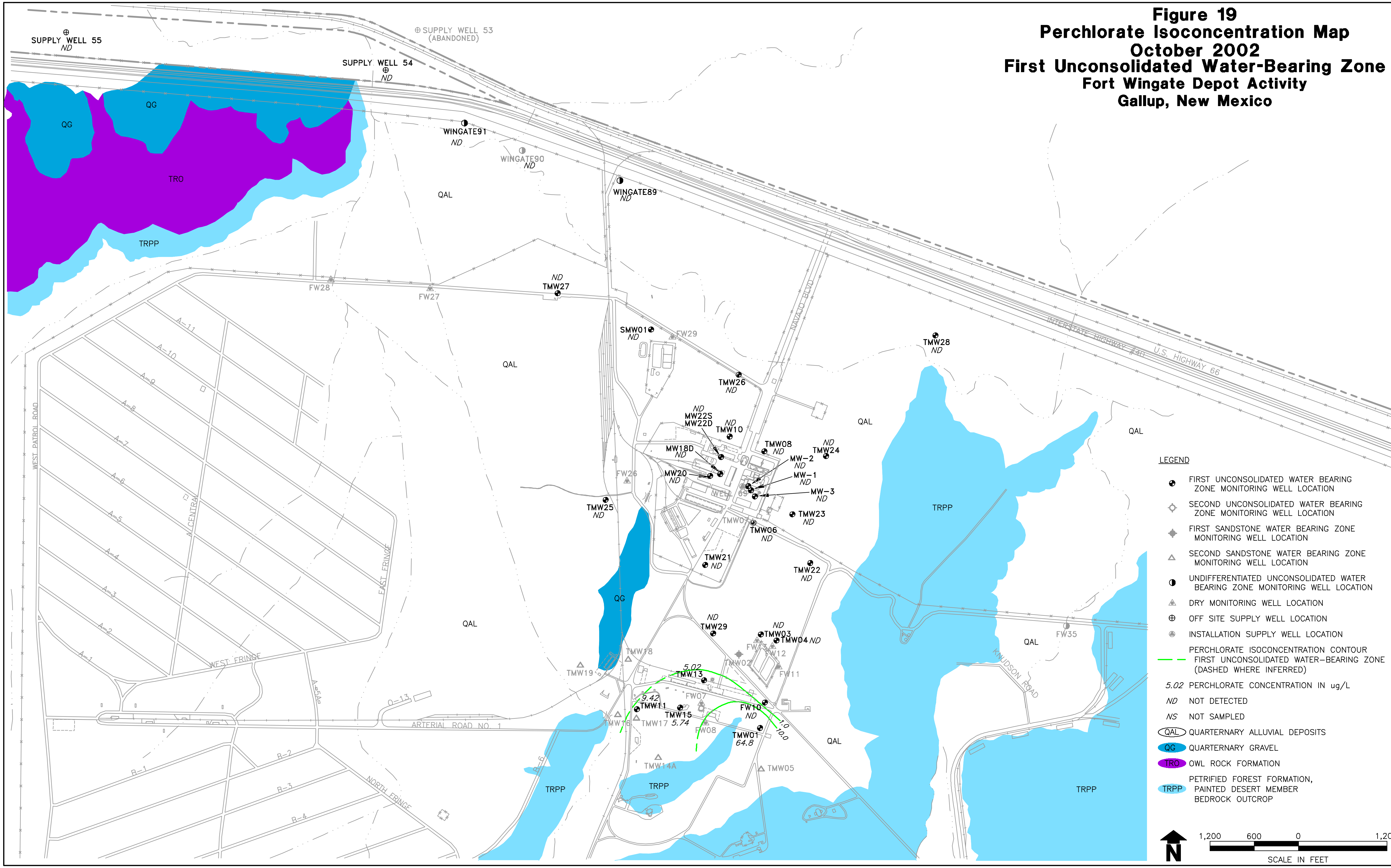
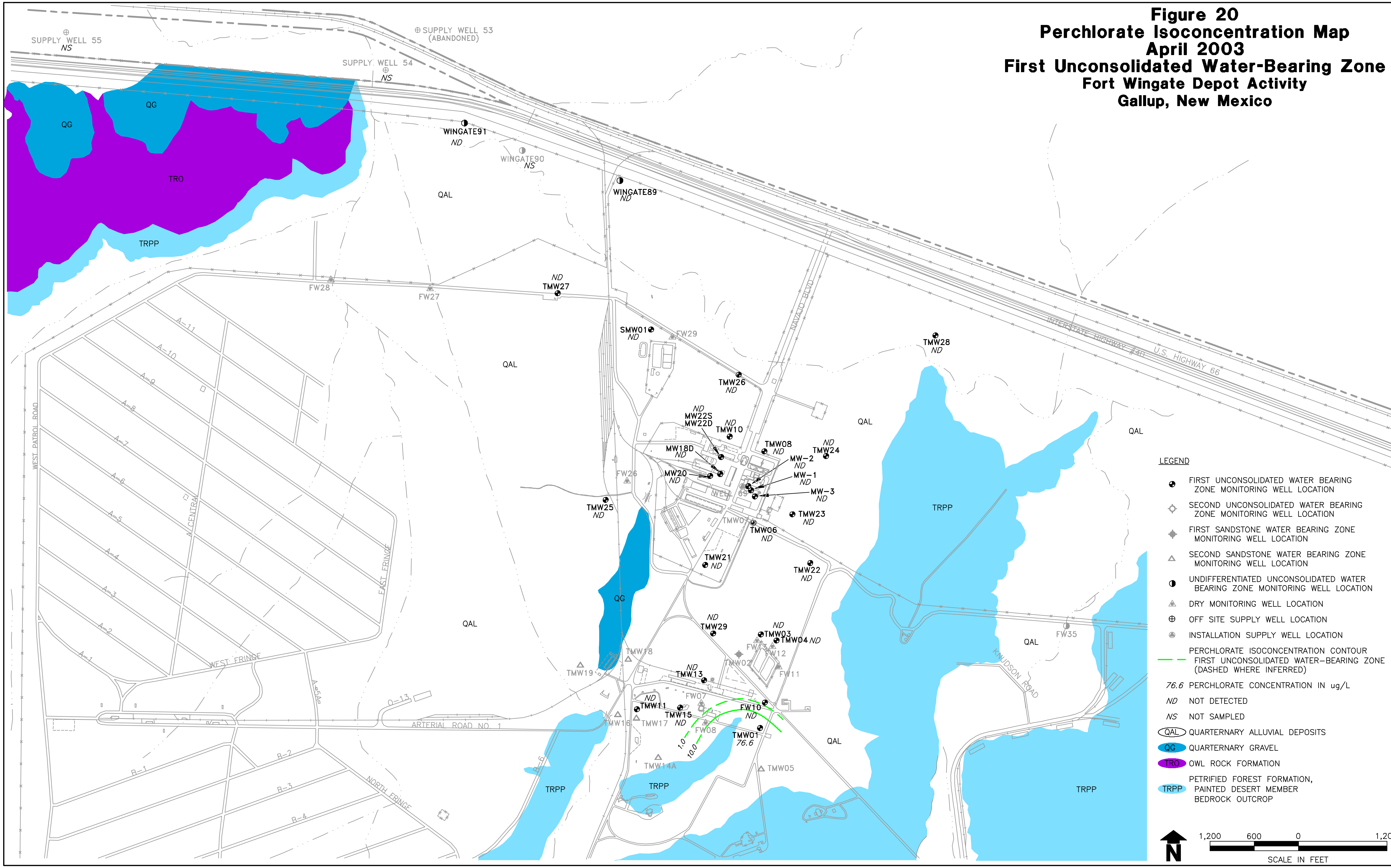


Figure 18
Nitrite Isoconcentration Map
April 2003
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico

Figure 19
Perchlorate Isoconcentration Map
October 2002
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico





TerranearPMC

33006.90/11.15.05-DST/I203-6C

Figure 21
1,2-Dichloroethane Isoconcentration Map
October 2002
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico

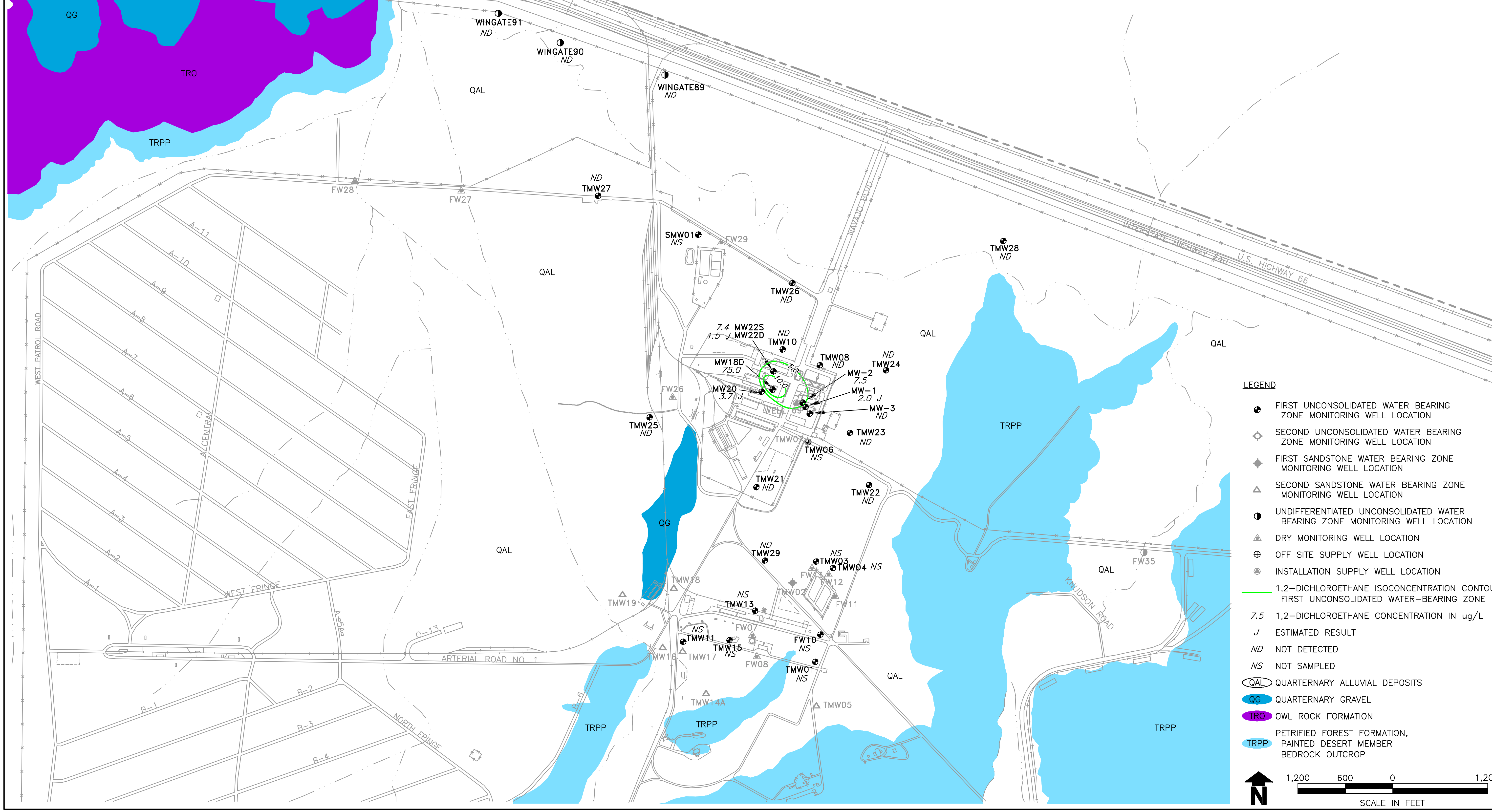


Figure 22
1,2-Dichloroethane Isoconcentration Map
April 2003
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico

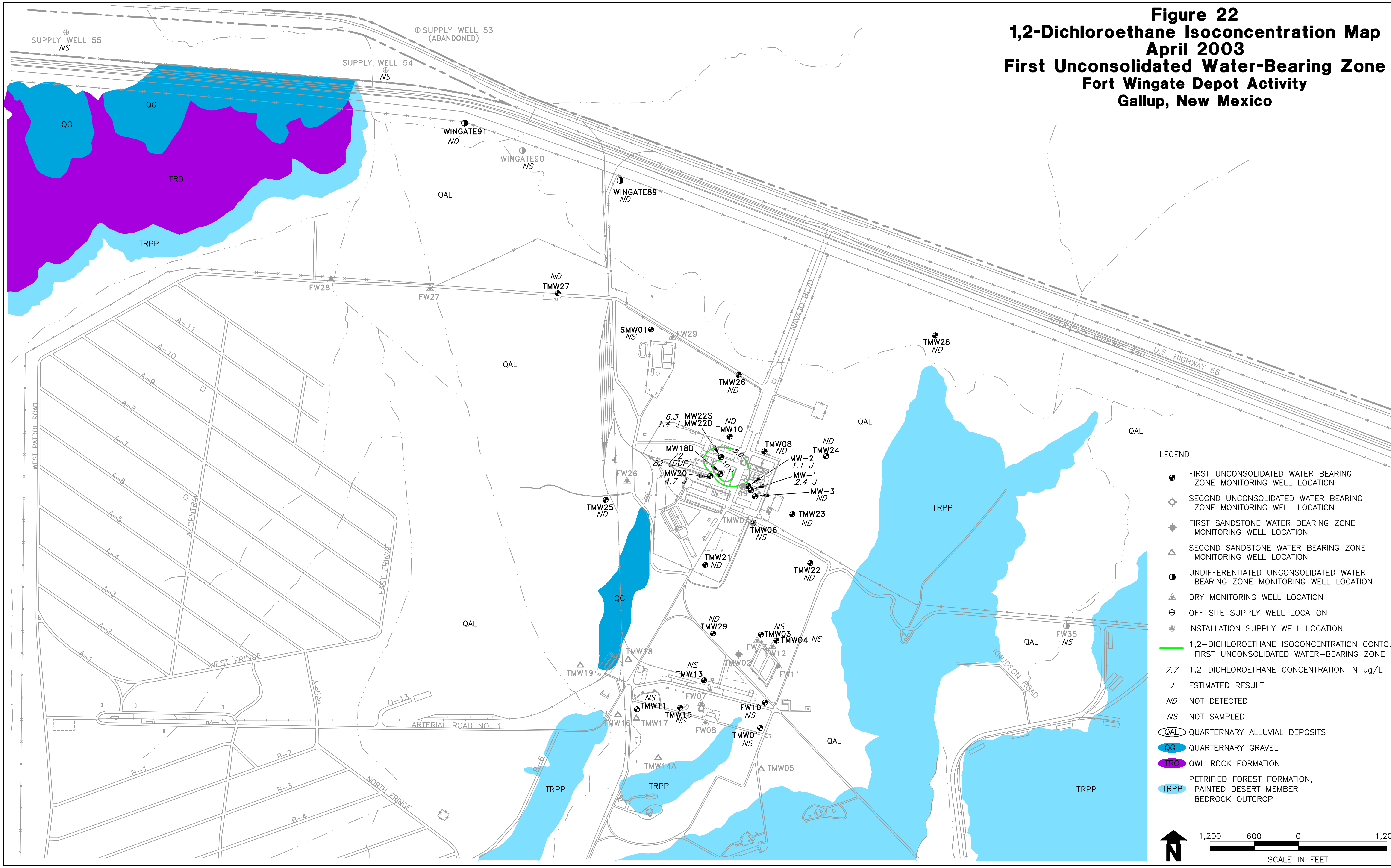


Figure 23
Toluene Detection Map
October 2002 and April 2003
Fort Wingate Depot Activity
Gallup, New Mexico

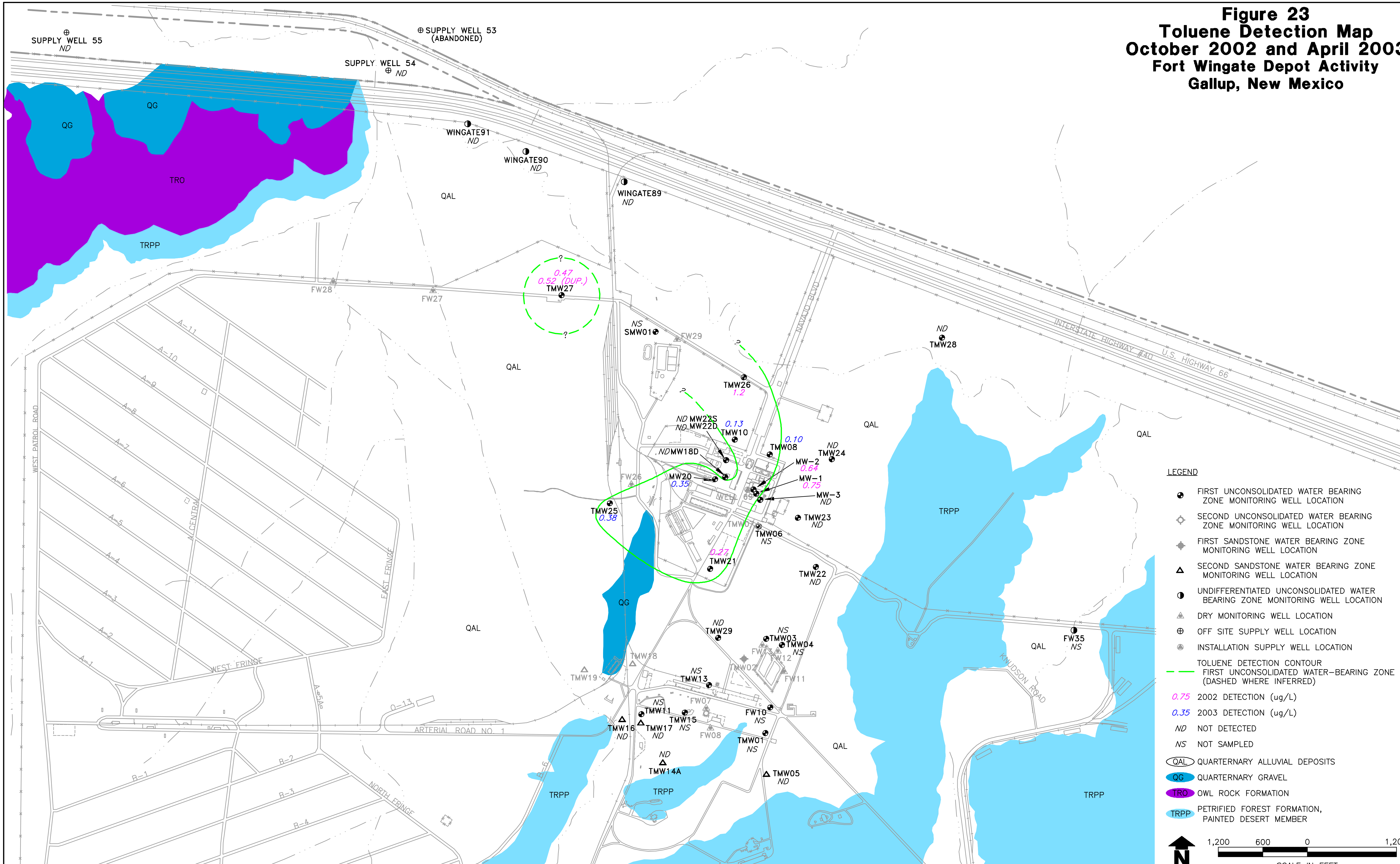


Figure 24
Total Pesticides Isoconcentration Map
October 2002
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico

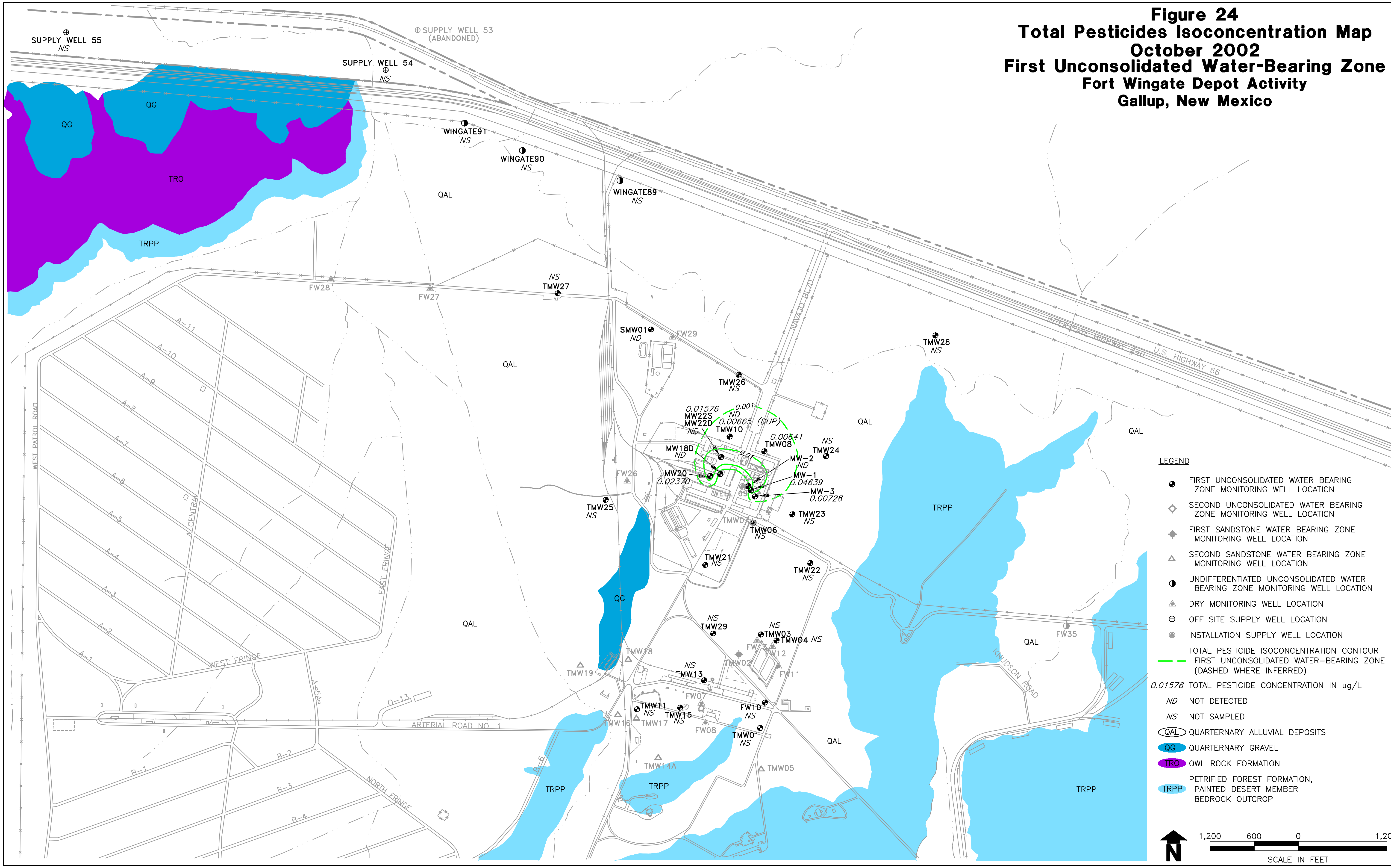


Figure 25
Total Pesticides Isoconcentration Map
April 2003
First Unconsolidated Water-Bearing Zone
Fort Wingate Depot Activity
Gallup, New Mexico

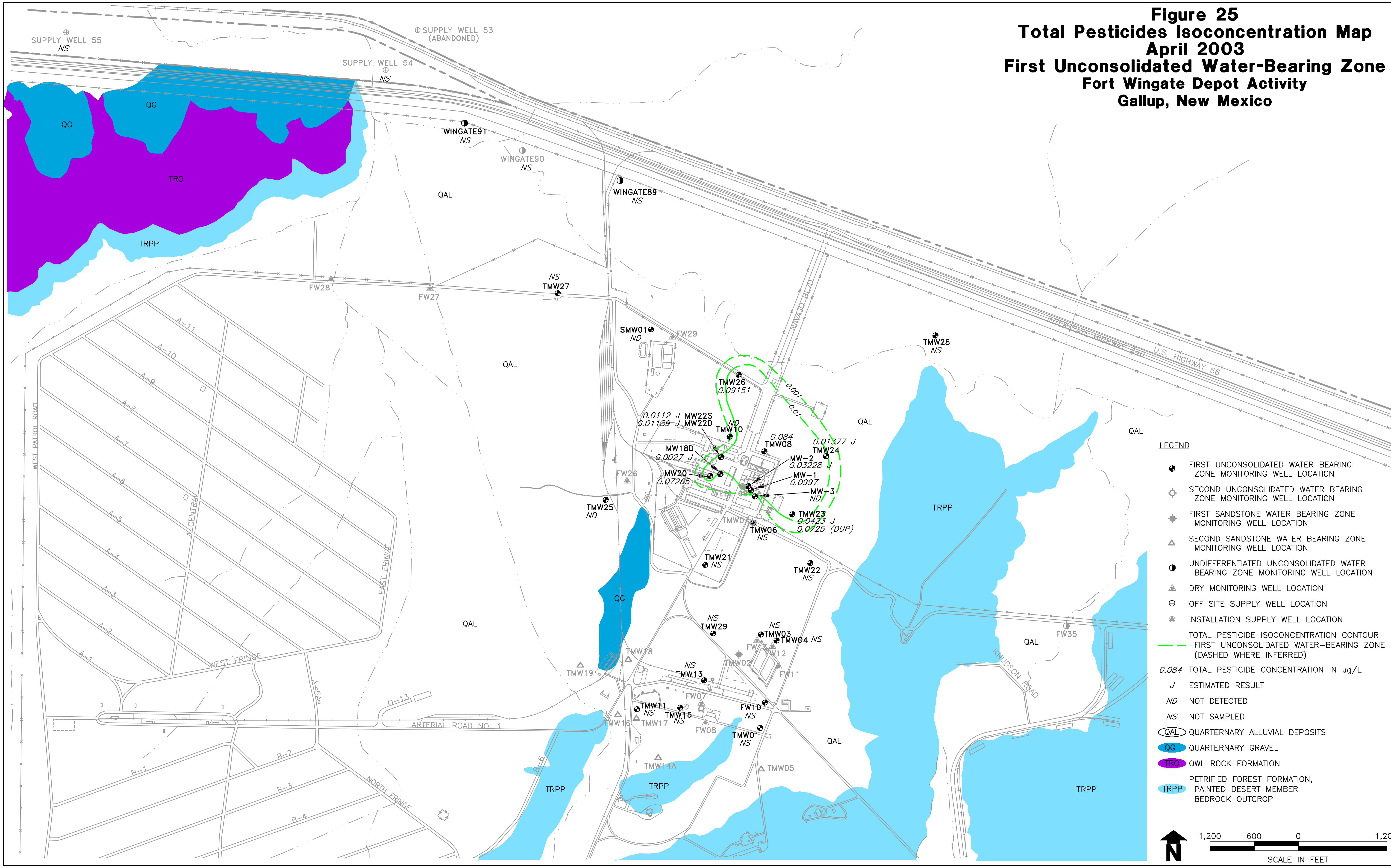


Table 1
Field Investigations
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Area of Concern	Activity	Number of Samples	Target Constituents
2002 Ground Water Investigations			
• Installation of Monitoring Wells	Drill nine new boreholes and complete as ground water monitoring wells; collect one soil sample from the screened interval of each well.	9 soil	Particle Size, Dry Bulk Density, Porosity, Total Organic Carbon, and Cation Exchange Capacity
• Slug Testing	Perform slug testing on newly installed monitoring wells.		
• Ground Water Sampling	Collect ground water samples from nine new monitoring wells, background well TMW14A, existing perimeter wells Wingate89, Wingate90, and Wingate91, and the nearest off-site supply wells designated as Well Nos. 54 and 55.	15 ground water	Expanded Explosives List, Target compound list (TCL) Volatile Organic Compounds (VOCs), Target analyte list (TAL) Total and Dissolved Metals, Nitrate/Nitrite Non-Specific, Nitrate, and Perchlorate
• Ground Water Sampling	Collect ground water samples from TMW01, TMW02, TMW03, TMW04, TMW05, TMW06, TMW07, TMW08, TMW10, TMW11, TMW13, and FW10.	12 ground water	Expanded Explosives List, Nitrate/Nitrite Non-Specific, Nitrate, and Perchlorate
• Ground Water Sampling	Collect ground water samples from TMW15, SMW01, MW18D, MW20, MW22S, MW22D, MW1, MW2, and MW3.	9 ground water	Nitrate/Nitrite Non-Specific, Nitrate, and Perchlorate
• Ground Water Sampling	Collect ground water samples from TMW08, TMW10, MW18D, MW20, MW22S, MW22D, MW1, MW2, and MW3.	9 ground water	TCL VOCs, and Pesticides
• Ground Water Sampling	Collect ground water samples from TMW16, TMW17, TMW18, and TMW19.	4 ground water	Perchlorate

Table 1
Field Investigations
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Area of Concern	Activity	Number of Samples	Target Constituents
2003 Ground Water Investigation			
• Ground Water Sampling	Collect ground water samples from nine new monitoring wells, background well TMW14A, and existing perimeter wells Wingate89 and Wingate91.	12 ground water	Expanded Explosives List, TCL VOCs, TAL Total and Dissolved Metals, Nitrate/Nitrite Non-Specific, Nitrate, and Perchlorate
• Ground Water Sampling	Collect ground water samples from TMW01, TMW02, TMW03, TMW04, TMW05, TMW06, TMW07, TMW08, TMW10, TMW11, TMW13, TMW15, and FW10.	13 ground water	Expanded Explosives List, Nitrate/Nitrite Non-Specific, Nitrate, and Perchlorate
• Ground Water Sampling	Collect ground water samples from SMW01, MW18D, MW20, MW22S, MW22D, MW1, MW2, and MW3.	8 ground water	Nitrate/Nitrite Non-Specific, Nitrate, and Perchlorate
• Ground Water Sampling	Collect ground water samples from TMW08, TMW10, MW18D, MW20, MW22S, MW22D, MW1, MW2, and MW3.	9 ground water	TCL VOCs, and Pesticides
• Ground Water Sampling	Collect ground water samples from SMW01, TMW23, TMW24, TMW25, and TMW26.	5 ground water	Pesticides
• Ground Water Sampling	Collect ground water samples from TMW05, TMW16, and TMW17.	3 ground water	TCL VOCs
• Ground Water Sampling	Collect ground water samples from TMW16, TMW17, TMW18, and TMW19.	4 ground water	Perchlorate

Table 2
Monitoring Well Location Rationale
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Monitoring Well Identification	Depth (feet)	Monitoring Well Location Rationale
TMW21	58	Establish and monitor the western downgradient edge of explosives and elevated nitrate/nitrite concentrations in the first unconsolidated water-bearing zone.
TMW22	62	Establish and monitor the northeastern downgradient edge of explosives and elevated nitrate/nitrite concentrations in the first unconsolidated water-bearing zone.
TMW23	56	Establish and monitor the northeastern downgradient edge of explosives and elevated nitrate/nitrite concentrations in the first unconsolidated water-bearing zone.
TMW24	54	Establish and monitor if nitrate/nitrite is present in the first unconsolidated water-bearing zone, and determine the presence/absence of off-post migration.
TMW25	52.5	Establish and monitor if nitrate/nitrite is present in the first unconsolidated water-bearing zone, and determine the presence/absence of off-post migration.
TMW26	55	Establish and monitor if nitrate/nitrite is present in the first unconsolidated water-bearing zone, and determine the presence/absence of off-post migration.
TMW27	70	Establish and monitor if nitrate/nitrite is present in the first unconsolidated water-bearing zone, and determine the presence/absence of off-post migration.
TMW28	47	Install a monitoring well in the Rio Puerco Valley sediments that is located hydraulically upgradient of the Administration and TNT Leaching Beds Areas to determine background ground water quality.
TMW29	59	Establish and monitor the western downgradient edge of explosives and elevated nitrate/nitrite concentrations in the first unconsolidated water-bearing zone.

Table 3
Monitoring Well Construction
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Monitoring Well ID	Installation Date	Drilling Method	Ground Surface Elevation (feet AMSL)	Top of Casing Elevation (feet AMSL)	Well Stickup (feet ags)	Well Casing Diameter (inches)	Borehole Diameter (inches)	Total Depth Drilled (feet bgs)	Total Well Depth (feet bgs)	Well Screen Length (feet)	Well Screened Interval (feet bgs)	Well Screened Interval (feet AMSL)	Screened Formation
TMW21	8/9/02	HSA	6693.62	6695.64	2.02	2	8	72.0	58.0	10	48-58	6645.62-6635.62	Sand/Silt/Clay
TMW22	8/8/02	HSA	6690.59	6692.25	1.67	2	8	77.0	62.0	10	52-62	6638.25-6628.25	Sand/Silt/Clay
TMW23	8/6/02	HSA	6686.31	6688.46	2.16	2	8	72.0	56.0	10	46-56	6640.31-6630.31	Clay/Sand
TMW24	8/3/03	HSA	6679.11	6680.85	1.74	2	8	75.0	54.0	10	44-54	6635.11-6625.11	Silty Sand/Silt/Sand
TMW25	8/1/02	HSA	6671.43	6672.96	1.53	2	8	74.0	52.5	10	42.5-52.5	6628.93-6618.93	Silty Sand/Clay
TMW26	7/30/02	HSA	6675.58	6678.21	2.63	2	8	64.8	55.0	10	45-55	6630.58-6620.58	Silt/Sand/Clay
TMW27	7/26/02	HSA	6666.34	6668.48	2.13	2	8	102.2	70.0	10	60-70	6606.34-6596.34	Sand
TMW28	7/24/02	HSA	6687.77	6690.08	2.31	2	8	72.5	47.0	10	37-47	6640.77-6630.77	Silty Sand/Sand/Clay
TMW29	8/19/02	HSA	6701.32	6703.68	2.36	2	8	69.0	59.0	10	49-59	6652.32-6642.32	Sand/Sandy Clay

Notes:
ags - above ground surface
AMSL = above mean sea level
bgs = below ground surface
HSA = hollow stem auger

Table 4
Monitoring Well Development
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Monitoring Well ID	Date Development Initiated	Date Development Completed	Development Method	Depth to Water[1] (feet TOC)	Equivalent Well Volume (gal)	Volume Purged (gal)	Pumping Rate (gpm)	pH (final)	Conductivity (final) (µMHOs/cm)	Temperature (final) (Celsius)	Turbidity (final) (NTU)	Depth to Water[2] (feet TOC)	Recharge Rate (gph)
TMW21	8/26/02	8/30/02	Bailer	50.05	203.2	50.5	<0.20	7.94	2,430	14.45	>999	50.19	3.14
TMW22	8/26/02	8/30/02	Bailer	50.05	241.8	24.0	<0.20	8.75	2,910	14.57	>999	50.92	2.41
TMW23	8/21/02	8/30/02	Bailer	46.80	209.3	22.0	<0.20	8.18	3,170	15.32	>999	47.78	1.43
TMW24	8/21/02	8/30/02	Bailer	42.03	267.0	29.5	<0.20	7.99	3,960	14.28	>999	48.76	1.14
TMW25	8/21/02	8/30/02	Bailer	39.64	342.2	101.0	<0.20	7.85	4,550	15.35	>999	40.32	3.24
TMW26	8/21/02	8/30/02	Bailer	26.93	179.9	70.5	<0.20	8.06	4,650	13.89	>999	31.66	2.35
TMW27	7/27/02	8/29/02	2" pump	28.92	423.1	460.0	~0.20	8.20	1,097	17.08	792.0	29.02	13.2
TMW28	8/21/02	8/24/02	2" pump	18.80	203.0	208.0	~0.50	7.37	1,057	12.92	125.0	18.88	37.5
TMW29	8/21/02	8/30/02	Bailer	56.64	523.1	17.0	<0.20	10.12	2,010	14.46	>999	56.63	1.39

Notes:

[1] - Depth to water measured prior to development

[2] - Depth to water 24 hours after development completed

gph = gallons per hour

gpm = gallons per minute

µMHOs/cm - milliohms per centimeter

TOC - top of casing

NTU = nephelometric turbidity units

gal = gallons

Equivalent Well Volume = Volume of water in well casing and volume of water in annular space

Table 5
Monitoring Well Slug Test Results
Administration and TNT Leaching Beds
Fort Wingate Depot Activity
Gallup, New Mexico

Monitoring Well ID	Slug Test Analytical Method	Head Test	Aquifer	Screen Zone Lithology	K (ft/day)	K (cm/sec)
TMW06	KGS	Fall	Unconfined	Sand and Silt	0.0287	1.0E-05
		Rise			0.1086	3.8E-05
TMW08	Bouwer-Rice	Fall	Unconfined	Silty Sand	1.5930	5.6E-04
		Rise			2.7150	9.6E-04
TMW10	Bouwer-Rice	Fall	Unconfined	Sand, Silt, and Little Clay	0.3957	1.4E-04
		Rise			0.6986	2.5E-04
TMW11	Bouwer-Rice	Fall	Unconfined	Silty Sand	0.6971	2.5E-04
		Rise			1.1440	4.0E-04
TMW21	KGS	Fall	Unconfined	Clay, Silt, and Sand	0.0784	2.8E-05
		Rise			0.0280	9.9E-06
TMW22	KGS	Fall	Unconfined	Clay, Silt, and Sand	0.0054	1.9E-06
		Rise			0.0009	3.3E-07
TMW23	KGS	Fall	Confined	Silty Sand	0.0856	3.0E-05
		Rise			0.0296	1.0E-05
TMW24	KGS	Fall	Confined	Silt and Sand	0.0053	1.9E-06
		Rise			0.0113	4.0E-06
TMW25	KGS	Fall	Unconfined	Clay, Silt, and Sand	0.0726	2.6E-05
		Rise			0.0473	1.7E-05
TMW26	KGS	Fall	Confined	Clay, Silt, and Sand	0.0710	2.5E-05
		Rise			0.0037	1.3E-06
TMW27	KGS	Fall	Confined	Silty Sand	0.3332	1.2E-04
		Rise			0.2084	7.4E-05
TMW28	KGS	Fall	Confined	Clay, Silt, and Sand	1.2400	4.4E-04
		Rise			0.8007	2.8E-04
TMW29	KGS	Fall	Unconfined	Clay, Silt, and Sand	0.0393	1.4E-05
		Rise			0.0805	2.8E-05

Notes:

K - Hydraulic Conductivity
ft/day - feet per day
cm/sec - centimeters per second
KGS - Kansas Geological Survey (Hyder et al., 1994)
Bouwer-Rice - (Bouwer-Rice, 1976)

Table 6
Ground Water Elevation Data
October 2002 and April 2003
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Monitoring Well ID	Surveyed Ground Surface Elevation (feet AMSL)	Surveyed Top of Casing Elevation (feet AMSL)	Depth to Water 10/21/2002 (feet BTOC)	Ground Water Elevation 10/21/2002 (feet AMSL)	Depth to Water 4/7/2003 (feet BTOC)	Ground Water Elevation 4/7/2003 (feet AMSL)
First Unconsolidated Water-Bearing Zone						
TMW01	6710.64	6712.41	32.05	6680.36	32.22	6680.19
TMW03	6701.20	6702.92	56.26	6646.66	56.56	6646.36
TMW04	6699.63	6701.33	56.06	6645.27	56.18	6645.15
TMW06	6689.65	6691.09	46.79	6644.30	46.73	6644.36
TMW08	6679.44	6680.84	35.94	6644.90	35.71	6645.13
TMW10	6678.78	6680.66	36.23	6644.43	36.19	6644.47
TMW11	6717.17	6718.92	65.25	6653.67	65.34	6653.58
TMW13	6706.64	6708.13	58.99	6649.14	59.05	6649.08
TMW15	6711.61	6714.53	63.09	6651.44	63.20	6651.33
TMW21	6694.01	6696.07	49.99	6646.08	50.08	6645.99
TMW22	6690.52	6692.36	50.92	6641.44	49.80	6642.56
TMW23	6686.28	6688.38	46.91	6641.47	46.62	6641.76
TMW24	6679.08	6680.71	42.60	6638.11	41.88	6638.83
TMW25	6671.39	6672.97	40.19	6632.78	40.13	6632.84
TMW26	6675.65	6678.21	27.15	6651.06	26.76	6651.45
TMW27	6666.58	6668.63	29.10	6639.53	28.81	6639.82
TMW28	6687.89	6690.09	18.22	6671.87	17.56	6672.53
TMW29	6701.62	6703.97	56.57	6647.40	56.78	6647.19
MW01	6687.00	6686.65	40.53	6646.12	39.84	6646.81
MW02	6685.60	6685.09	37.06	6648.03	35.57	6649.52
MW03	6688.18	6690.53	45.25	6645.28	44.96	6645.57
MW18D	6685.26	6686.94	41.68	6645.26	41.45	6645.49
MW20	6686.03	6688.19	44.24	6643.95	44.09	6644.10
MW22D	6683.29	6685.17	40.60	6644.57	40.50	6644.67
MW22S	6683.29	6685.11	40.58	6644.53	40.48	6644.63
SMW01	6668.54	6670.01	30.29	6639.72	30.43	6639.58
FW10	6707.39	6708.93	41.36	6667.57	48.88	6660.05
FW27	6656.17	6657.32	ND	NA	31.69	6625.63
FW29	6669.44	6671.50	ND	NA	31.63	6639.87
FW35	6709.47	6711.41	ND	NA	10.05	6701.36
Second Unconsolidated Water-Bearing Zone						
TMW07	6689.60	6691.11	47.89	6643.22	48.59	6642.52
Undifferentiated Unconsolidated Water-Bearing Zone						
Wingate 89	6664.00	6664.34	18.85	6645.49	15.37	6648.97
Wingate 90	6656.61	6657.72	14.04	6643.68	13.64	6644.08
Wingate 91	6655.32	6656.18	14.84	6641.34	14.39	6641.79

Table 6
Ground Water Elevation Data
October 2002 and April 2003
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Monitoring Well ID	Surveyed Ground Surface Elevation (feet AMSL)	Surveyed Top of Casing Elevation (feet AMSL)	Depth to Water 10/21/2002 (feet BTOC)	Ground Water Elevation 10/21/2002 (feet AMSL)	Depth to Water 4/7/2003 (feet BTOC)	Ground Water Elevation 4/7/2003 (feet AMSL)
First Sandstone Water-Bearing Zone						
TMW02	6704.69	6706.15	53.46	6652.69	53.47	6652.68
Second Sandstone Water-Bearing Zone						
TMW05	6713.78	6715.30	34.53	6680.77	34.67	6680.63
TMW14A	6722.36	6724.54	62.19	6662.35	62.52	6662.02
TMW16	6712.67	6715.15	53.96	6661.19	54.03	6661.12
TMW17	6718.39	6720.94	61.11	6659.83	61.04	6659.90
TMW18	6711.65	6714.36	52.56	6661.80	52.73	6661.63
TMW19	6698.93	6701.54	40.17	6661.37	40.35	6661.19

Notes:

AMSL - Above mean sea level
BTOC - Below top of casing
NA - Not Applicable
ND - No Data Available
All wells resurveyed during April 2003.

Table 7
Water-Bearing Zone Properties
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Collection Date	Depth (feet bgs)	USCS Classification	Moisture Content (percent)	Dry Bulk Density (pcf)	Porosity[1] (percent)	Total Organic Carbon (ug/g)	Cation Exchange Capacity	
								Analytical Result (ug/g)	Calculated Result (meq. Na/100g)
TMW2158	8/9/02	48-58	CL - Sandy Lean Clay	23	94	38	1,300 U	5,200	22.6
TMW2262	8/7/02	52-62	CL - Sandy Lean Clay	22	96	37	1,070 U	7,440	32.3
TMW2356	8/6/02	46-56	SC - Clayey Sand	20	95	35	765 U	4,210	18.3
TMW2454	8/3/02	44-54	CL - Sandy Lean Clay	26	88	41	1,600	4,190	18.2
TMW2552	7/31/02	42-52	CL - Lean Clay with Sand	27	88	42	1,980	5,240	22.8
TMW2655	7/30/02	45-55	CL - Lean Clay with Sand	25	89	40	2,360	7,110	30.9
TMW2770	7/26/02	60-70	SM - Silty Sand	24	93	39	779 U	3,740	16.3
TMW2770*	7/26/02	60-70	SM - Silty Sand	24	93	39	1,100 U	3,560	15.5
TMW2847	7/23/02	37-47	SM - Silty Sand	22	97	37	1,490	4,970	21.6
TMW2959	8/19/02	49-59	CL - Sandy Lean Clay	20	94	38	2,000 U	5,520	24.0

Notes:

1 - Calculated porosity based upon weight-volume relationships (obtained from Departments of the Army and Air Force, Soils and Geology Procedures for Foundation Design of Buildings and Other Structures [Excluding Hydraulic Structure], TM 5-818-1, 1983).

* - Duplicate sample.

bgs - below ground surface.

USCS - Unified Soil Classification System.

pcf - pounds per cubic foot.

ug/g - micrograms per gram.

meq. Na/100g - milliequivalent of sodium per 100 grams of soil.

U - not detected at reported value.

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
FW10	2,6-Dinitrotoluene	10/23/02	0.110	J
FW10	Nitrate-N	11/1/02	14300	
MW-1	Nitrate-N	10/16/02	16000	
MW-1	Nitrate-N	4/1/03	14700	
MW-1	Nitrite-N by Calculation	4/1/03	1500	
MW-1	1,2-Dichloroethane	10/16/02	2.00	J
MW-1	1,2-Dichloroethane	4/1/03	2.40	J
MW-1	Toluene	10/16/02	0.750	J
MW-1	DDE	10/16/02	0.0159	J
MW-1	DDT	10/16/02	0.0122	J
MW-1	Endosulfan II	4/1/03	0.0997	
MW-1	Lindane	10/16/02	0.00549	J
MW-1	Methoxychlor	10/16/02	0.0128	J
MW-2	Nitrate-N	10/15/02	372	J
MW-2	Nitrate-N	4/1/03	620	
MW-2	Nitrite-N by Calculation	4/1/03	580	
MW-2	1,2-Dichloroethane	10/15/02	7.50	
MW-2	1,2-Dichloroethane	4/1/03	1.10	J
MW-2	Toluene	10/15/02	0.640	J
MW-2	beta-BHC	4/1/03	0.0111	J
MW-2	DDT	4/1/03	0.0148	J
MW-2	Endosulfan Sulfate	4/1/03	0.00638	J
MW-3	Nitrate-N	10/16/02	12800	
MW-3	Nitrate-N	3/31/03	10800	
MW-3	Nitrite-N by Calculation	3/31/03	2000	
MW-3	DDE	10/16/02	0.00728	J
MW18D	1,2-Dichloroethane	10/16/02	75.0	
MW18D	1,2-Dichloroethane	3/28/03	72.0	
MW18D	1,2-Dichloroethane	3/28/03	82.0	D
MW18D	Lindane	3/28/03	0.00270	DJ
MW20	Nitrate-N	10/15/02	30600	J
MW20	Nitrate-N	3/31/03	32800	
MW20	Nitrite-N by Calculation	3/31/03	13100	
MW20	1,2-Dichloroethane	10/15/02	3.70	J
MW20	1,2-Dichloroethane	3/31/03	4.70	J
MW20	Bromomethane	3/31/03	0.410	J
MW20	Toluene	3/31/03	0.350	J
MW20	DDE	10/15/02	0.0142	J
MW20	Endosulfan II	3/31/03	0.0642	
MW20	Heptachlor Epoxide	3/31/03	0.00845	J
MW20	Methoxychlor	10/15/02	0.00950	J
MW22D	Nitrate-N	10/11/02	24800	
MW22D	Nitrate-N	10/11/02	26800	D
MW22D	Nitrate-N	3/31/03	21200	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
MW22D	Nitrite-N by Calculation	10/11/02	3190	D
MW22D	Nitrite-N by Calculation	10/11/02	4020	
MW22D	Nitrite-N by Calculation	3/31/03	1200	
MW22D	1,2-Dichloroethane	10/11/02	1.50	J
MW22D	1,2-Dichloroethane	3/31/03	1.40	J
MW22D	Endosulfan Sulfate	3/31/03	0.00780	J
MW22D	Lindane	3/31/03	0.00409	J
MW22S	Nitrate-N	10/16/02	15100	
MW22S	Nitrate-N	4/3/03	18400	
MW22S	1,1,1-Trichloroethane	4/3/03	2.10	J
MW22S	1,2-Dichloroethane	10/16/02	7.40	
MW22S	1,2-Dichloroethane	4/3/03	6.30	
MW22S	methyl-t-butyl ether	4/3/03	0.530	J
MW22S	DDE	10/16/02	0.00747	J
MW22S	Endrin Ketone	4/3/03	0.00312	J
MW22S	Heptachlor Epoxide	4/3/03	0.00361	J
MW22S	Lindane	4/3/03	0.00447	J
MW22S	Methoxychlor	10/16/02	0.00829	J
SUPPLYWELL 54	Barium	10/24/02	187	F
SUPPLYWELL 54	Barium	10/24/02	256	
SUPPLYWELL 54	Calcium	10/24/02	19100	F
SUPPLYWELL 54	Calcium	10/24/02	19100	
SUPPLYWELL 54	Cobalt	10/24/02	0.140	FJ
SUPPLYWELL 54	Cobalt	10/24/02	0.173	J
SUPPLYWELL 54	Copper	10/24/02	13.7	J
SUPPLYWELL 54	Iron	10/24/02	34.9	FJ
SUPPLYWELL 54	Iron	10/24/02	1810	
SUPPLYWELL 54	Lead	10/24/02	2.50	
SUPPLYWELL 54	Magnesium	10/24/02	5990	F
SUPPLYWELL 54	Magnesium	10/24/02	5940	
SUPPLYWELL 54	Manganese	10/24/02	172	F
SUPPLYWELL 54	Manganese	10/24/02	189	
SUPPLYWELL 54	Potassium	10/24/02	544	FJ
SUPPLYWELL 54	Potassium	10/24/02	951	J
SUPPLYWELL 54	Selenium	10/24/02	0.640	FJ
SUPPLYWELL 54	Selenium	10/24/02	0.561	J
SUPPLYWELL 54	Sodium	10/24/02	254000	F
SUPPLYWELL 54	Sodium	10/24/02	254000	
SUPPLYWELL 54	Vanadium	10/24/02	1.50	FJ
SUPPLYWELL 54	Vanadium	10/24/02	1.72	J
SUPPLYWELL 54	Zinc	10/24/02	5.50	F
SUPPLYWELL 54	Zinc	10/24/02	92.4	
SUPPLYWELL 55	Nitrate-N	10/24/02	4980	
SUPPLYWELL 55	Barium	10/24/02	25.9	F

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
SUPPLYWELL 55	Barium	10/24/02	25.6	
SUPPLYWELL 55	Calcium	10/24/02	71200	F
SUPPLYWELL 55	Calcium	10/24/02	70700	
SUPPLYWELL 55	Cobalt	10/24/02	0.480	FJ
SUPPLYWELL 55	Cobalt	10/24/02	0.425	J
SUPPLYWELL 55	Magnesium	10/24/02	18700	F
SUPPLYWELL 55	Magnesium	10/24/02	18600	
SUPPLYWELL 55	Manganese	10/24/02	61.9	F
SUPPLYWELL 55	Manganese	10/24/02	62.3	
SUPPLYWELL 55	Potassium	10/24/02	339	FJ
SUPPLYWELL 55	Potassium	10/24/02	816	J
SUPPLYWELL 55	Selenium	10/24/02	1.40	FJ
SUPPLYWELL 55	Selenium	10/24/02	1.54	J
SUPPLYWELL 55	Sodium	10/24/02	249000	F
SUPPLYWELL 55	Sodium	10/24/02	250000	
SUPPLYWELL 55	Vanadium	10/24/02	1.40	FJ
SUPPLYWELL 55	Vanadium	10/24/02	1.55	J
SUPPLYWELL 55	Zinc	10/24/02	28.0	F
SUPPLYWELL 55	Zinc	10/24/02	28.4	
TMW01	Nitrate-N	10/22/02	8450	
TMW01	Nitrate-N	4/1/03	8900	
TMW01	Nitrite-N by Calculation	4/1/03	3100	
TMW01	Perchlorate	10/22/02	64.8	
TMW01	Perchlorate	4/1/03	76.6	
TMW03	1,3,5-Trinitrobenzene	10/23/02	3.00	
TMW03	1,3,5-Trinitrobenzene	4/4/03	3.70	
TMW03	1,3,5-Trinitrobenzene	4/4/03	4.10	D
TMW03	1,3-Dinitrobenzene	4/4/03	0.460	
TMW03	1,3-Dinitrobenzene	4/4/03	0.520	D
TMW03	2,4,6-Trinitrotoluene	10/23/02	0.360	
TMW03	2,4,6-Trinitrotoluene	4/4/03	0.660	D
TMW03	2,4,6-Trinitrotoluene	4/4/03	0.770	
TMW03	2,4-Diamino-6-nitrotoluene	10/23/02	0.980	
TMW03	2,4-Diamino-6-nitrotoluene	4/4/03	3.60	
TMW03	2,4-Diamino-6-nitrotoluene	4/4/03	3.60	D
TMW03	2,4-Dinitrotoluene	10/23/02	1.40	
TMW03	2,4-Dinitrotoluene	4/4/03	1.10	
TMW03	2,4-Dinitrotoluene	4/4/03	1.10	D
TMW03	2,6-Diamino-4-nitrotoluene	10/23/02	110	J
TMW03	2,6-Diamino-4-nitrotoluene	4/4/03	86.0	D
TMW03	2,6-Diamino-4-nitrotoluene	4/4/03	90.0	
TMW03	2-Amino-4,6-dinitrotoluene	10/23/02	0.530	
TMW03	2-Amino-4,6-dinitrotoluene	4/4/03	0.460	
TMW03	2-Amino-4,6-dinitrotoluene	4/4/03	0.490	D

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW03	2-Nitrotoluene	4/4/03	9.20	
TMW03	2-Nitrotoluene	4/4/03	9.70	D
TMW03	3-Nitrotoluene	4/4/03	9.80	D
TMW03	3-Nitrotoluene	4/4/03	10.0	
TMW03	4-Amino-2,6-dinitrotoluene	10/23/02	0.920	
TMW03	4-Amino-2,6-dinitrotoluene	4/4/03	0.770	
TMW03	4-Amino-2,6-dinitrotoluene	4/4/03	0.780	D
TMW03	4-Nitrotoluene	10/23/02	0.680	
TMW03	4-Nitrotoluene	4/4/03	1.00	D
TMW03	4-Nitrotoluene	4/4/03	1.10	
TMW03	DNX	10/23/02	3.20	
TMW03	HMX	10/23/02	3.10	
TMW03	HMX	4/4/03	3.10	
TMW03	HMX	4/4/03	3.20	D
TMW03	MNX	10/23/02	5.30	
TMW03	Nitrobenzene	10/23/02	4.60	
TMW03	Nitrobenzene	4/4/03	5.40	D
TMW03	Nitrobenzene	4/4/03	6.50	
TMW03	RDX	10/23/02	220	
TMW03	RDX	4/4/03	220	D
TMW03	RDX	4/4/03	230	
TMW03	Nitrate-N	10/23/02	166000	J
TMW03	Nitrate-N	4/4/03	152000	J
TMW03	Nitrate-N	4/4/03	160000	DJ
TMW03	Nitrite-N by Calculation	4/4/03	1000	
TMW04	1,3,5-Trinitrobenzene	10/23/02	81.0	
TMW04	1,3,5-Trinitrobenzene	4/4/03	68.0	
TMW04	1,3-Dinitrobenzene	4/4/03	0.760	
TMW04	2,4,6-Trinitrotoluene	10/23/02	1.30	
TMW04	2,4,6-Trinitrotoluene	4/4/03	1.70	
TMW04	2,4-Diamino-6-nitrotoluene	10/23/02	0.590	
TMW04	2,4-Diamino-6-nitrotoluene	4/4/03	2.00	
TMW04	2,4-Dinitrotoluene	10/23/02	1.30	
TMW04	2,4-Dinitrotoluene	4/4/03	0.930	
TMW04	2,6-Diamino-4-nitrotoluene	10/23/02	320	J
TMW04	2,6-Diamino-4-nitrotoluene	4/4/03	260	
TMW04	2-Amino-4,6-dinitrotoluene	10/23/02	2.60	
TMW04	2-Amino-4,6-dinitrotoluene	4/4/03	2.20	
TMW04	2-Nitrotoluene	4/4/03	7.30	
TMW04	3-Nitrotoluene	4/4/03	47.0	
TMW04	4-Amino-2,6-dinitrotoluene	10/23/02	3.50	
TMW04	4-Amino-2,6-dinitrotoluene	4/4/03	3.00	
TMW04	4-Nitrotoluene	10/23/02	1.30	
TMW04	4-Nitrotoluene	4/4/03	1.40	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW04	DNX	10/23/02	9.60	
TMW04	HMX	10/23/02	0.300	
TMW04	MNX	10/23/02	3.10	
TMW04	Nitrobenzene	10/23/02	22.0	
TMW04	Nitrobenzene	4/4/03	19.0	
TMW04	RDX	10/23/02	17.0	J
TMW04	RDX	4/4/03	41.0	
TMW04	Nitrate-N	10/23/02	40800	J
TMW04	Nitrate-N	4/4/03	41000	J
TMW04	Nitrite-N by Calculation	10/23/02	10100	
TMW06	2,6-Diamino-4-nitrotoluene	10/18/02	11.0	
TMW06	2-Nitrotoluene	4/3/03	2.40	
TMW06	RDX	4/3/03	0.700	
TMW06	Nitrate-N	10/18/02	25000	
TMW06	Nitrate-N	4/3/03	25200	J
TMW06	Nitrite-N by Calculation	10/18/02	2190	
TMW06	Nitrite-N by Calculation	4/3/03	7500	
TMW08	Nitrate-N	10/9/02	7830	J
TMW08	Nitrate-N	3/27/03	7800	
TMW08	Toluene	3/27/03	0.100	J
TMW08	Endosulfan II	3/27/03	0.0804	
TMW08	Endosulfan Sulfate	3/27/03	0.00360	J
TMW08	Endrin ketone	10/9/02	0.00641	J
TMW10	Nitrate-N	10/9/02	638	DJ
TMW10	Nitrate-N	10/9/02	646	J
TMW10	Nitrate-N	3/27/03	540	
TMW10	Nitrite-N by Calculation	10/9/02	125	D
TMW10	Toluene	3/27/03	0.130	J
TMW10	Endrin ketone	10/9/02	0.00665	DJ
TMW11	RDX	10/18/02	0.390	
TMW11	RDX	4/2/03	0.480	
TMW11	Nitrate-N	10/18/02	642	
TMW11	Nitrate-N	4/2/03	680	
TMW11	Perchlorate	10/18/02	9.42	
TMW13	Nitrate-N	10/21/02	3220	J
TMW13	Nitrate-N	3/27/03	2900	
TMW13	Perchlorate	10/21/02	5.02	
TMW15	Nitrate-N	10/21/02	1770	J
TMW15	Nitrate-N	3/27/03	1700	
TMW15	Perchlorate	10/21/02	5.74	
TMW21	MNX	10/17/02	0.240	J
TMW21	Nitrate-N	10/17/02	5820	J
TMW21	Nitrate-N	4/2/03	7600	
TMW21	Nitrite-N by Calculation	10/17/02	1350	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW21	Nitrite-N by Calculation	4/2/03	800	
TMW21	Toluene	4/2/03	0.270	J
TMW21	Aluminum	4/2/03	71.8	FJ
TMW21	Aluminum	10/17/02	4300	
TMW21	Aluminum	4/2/03	2160	
TMW21	Arsenic	10/17/02	2.17	FJ
TMW21	Arsenic	4/2/03	0.737	FJ
TMW21	Arsenic	10/17/02	1.97	J
TMW21	Arsenic	4/2/03	0.708	J
TMW21	Barium	10/17/02	24.8	F
TMW21	Barium	4/2/03	23.6	F
TMW21	Barium	10/17/02	49.6	
TMW21	Barium	4/2/03	35.5	
TMW21	Calcium	10/17/02	38200	F
TMW21	Calcium	4/2/03	35700	F
TMW21	Calcium	10/17/02	38700	
TMW21	Calcium	4/2/03	36000	
TMW21	Cobalt	10/17/02	0.242	FJ
TMW21	Cobalt	4/2/03	0.314	FJ
TMW21	Cobalt	10/17/02	0.640	J
TMW21	Cobalt	4/2/03	0.438	J
TMW21	Iron	10/17/02	2040	
TMW21	Iron	4/2/03	1070	
TMW21	Lead	10/17/02	0.924	J
TMW21	Magnesium	10/17/02	10300	F
TMW21	Magnesium	4/2/03	8960	F
TMW21	Magnesium	10/17/02	10900	
TMW21	Magnesium	4/2/03	9330	
TMW21	Manganese	10/17/02	96.4	F
TMW21	Manganese	4/2/03	129	F
TMW21	Manganese	10/17/02	132	
TMW21	Manganese	4/2/03	143	
TMW21	Potassium	10/17/02	1490	FJ
TMW21	Potassium	10/17/02	2580	J
TMW21	Selenium	10/17/02	5.58	F
TMW21	Selenium	4/2/03	4.62	FJ
TMW21	Selenium	10/17/02	4.19	J
TMW21	Selenium	4/2/03	4.50	J
TMW21	Sodium	10/17/02	516000	F
TMW21	Sodium	4/2/03	518000	F
TMW21	Sodium	10/17/02	500000	
TMW21	Sodium	4/2/03	526000	
TMW21	Vanadium	4/2/03	4.39	FJ
TMW21	Vanadium	10/17/02	2.18	FJ

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW21	Vanadium	4/2/03	6.66	J
TMW21	Vanadium	10/17/02	4.22	J
TMW21	Zinc	4/2/03	8.40	FJ
TMW21	Zinc	4/2/03	5.56	J
TMW22	2,6-Diamino-4-nitrotoluene	10/17/02	9.70	
TMW22	RDX	4/1/03	0.390	
TMW22	Nitrate-N	10/17/02	1430	J
TMW22	Nitrate-N	4/1/03	3800	
TMW22	Nitrite-N by Calculation	10/17/02	478	
TMW22	Nitrite-N by Calculation	4/1/03	700	
TMW22	Aluminum	10/17/02	137	FJ
TMW22	Aluminum	4/1/03	15000	F
TMW22	Aluminum	10/17/02	2100	
TMW22	Aluminum	4/1/03	160000	
TMW22	Arsenic	10/17/02	1.16	FJ
TMW22	Arsenic	4/1/03	1.04	FJ
TMW22	Arsenic	4/1/03	2.33	J
TMW22	Barium	10/17/02	26.1	F
TMW22	Barium	4/1/03	171	F
TMW22	Barium	10/17/02	38.3	
TMW22	Barium	4/1/03	1420	
TMW22	Beryllium	4/1/03	0.906	FJ
TMW22	Beryllium	4/1/03	4.65	J
TMW22	Calcium	10/17/02	32700	F
TMW22	Calcium	4/1/03	57800	F
TMW22	Calcium	10/17/02	32300	
TMW22	Calcium	4/1/03	94500	
TMW22	Chromium	4/1/03	93.9	
TMW22	Cobalt	10/17/02	0.320	FJ
TMW22	Cobalt	4/1/03	2.02	F
TMW22	Cobalt	10/17/02	0.409	J
TMW22	Cobalt	4/1/03	8.07	
TMW22	Copper	4/1/03	5.23	FJ
TMW22	Copper	4/1/03	24.9	
TMW22	Iron	10/17/02	66.6	F
TMW22	Iron	4/1/03	6990	F
TMW22	Iron	10/17/02	924	
TMW22	Iron	4/1/03	78400	
TMW22	Lead	4/1/03	4.33	F
TMW22	Lead	4/1/03	20.0	
TMW22	Magnesium	10/17/02	11400	F
TMW22	Magnesium	4/1/03	14000	F
TMW22	Magnesium	10/17/02	11500	
TMW22	Magnesium	4/1/03	49800	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW22	Manganese	10/17/02	134	F
TMW22	Manganese	4/1/03	560	F
TMW22	Manganese	10/17/02	130	
TMW22	Manganese	4/1/03	1540	
TMW22	Mercury	4/1/03	0.0385	J
TMW22	Nickel	4/1/03	63.2	
TMW22	Potassium	10/17/02	1670	FJ
TMW22	Potassium	4/1/03	4360	F
TMW22	Potassium	10/17/02	2140	J
TMW22	Potassium	4/1/03	31100	
TMW22	Selenium	10/17/02	4.43	FJ
TMW22	Selenium	4/1/03	1.66	FJ
TMW22	Selenium	10/17/02	2.64	J
TMW22	Selenium	4/1/03	1.15	J
TMW22	Sodium	10/17/02	634000	F
TMW22	Sodium	4/1/03	673000	F
TMW22	Sodium	10/17/02	633000	
TMW22	Sodium	4/1/03	677000	
TMW22	Thallium	10/17/02	0.0847	J
TMW22	Thallium	4/1/03	0.193	J
TMW22	Vanadium	4/1/03	13.7	FJ
TMW22	Vanadium	10/17/02	3.39	FJ
TMW22	Vanadium	4/1/03	169	
TMW22	Vanadium	10/17/02	3.79	J
TMW22	Zinc	4/1/03	29.3	F
TMW22	Zinc	4/1/03	145	
TMW23	2,4,6-Trinitrotoluene	10/10/02	0.390	J
TMW23	2,4,6-Trinitrotoluene	4/1/03	0.570	DJ
TMW23	2,4,6-Trinitrotoluene	4/1/03	0.600	J
TMW23	2,4-Diamino-6-nitrotoluene	10/10/02	3.80	J
TMW23	2,4-Diamino-6-nitrotoluene	4/1/03	1.50	DJ
TMW23	2,4-Diamino-6-nitrotoluene	4/1/03	1.60	J
TMW23	2,6-Diamino-4-nitrotoluene	10/10/02	90.0	J
TMW23	2,6-Diamino-4-nitrotoluene	4/1/03	53.0	J
TMW23	2,6-Diamino-4-nitrotoluene	4/1/03	55.0	DJ
TMW23	2-Nitrotoluene	4/1/03	14.0	J
TMW23	2-Nitrotoluene	4/1/03	14.0	DJ
TMW23	3-Nitrotoluene	10/10/02	9.60	J
TMW23	3-Nitrotoluene	4/1/03	12.0	J
TMW23	3-Nitrotoluene	4/1/03	12.0	DJ
TMW23	4-Nitrotoluene	10/10/02	0.080	J
TMW23	DNX	10/10/02	3.00	J
TMW23	DNX	4/1/03	2.70	J
TMW23	DNX	4/1/03	2.70	DJ

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW23	MNX	4/1/03	2.10	J
TMW23	MNX	4/1/03	2.20	DJ
TMW23	Nitrobenzene	10/10/02	14.0	J
TMW23	Nitrobenzene	4/1/03	18.0	J
TMW23	Nitrobenzene	4/1/03	18.0	DJ
TMW23	RDX	10/10/02	30.0	J
TMW23	RDX	4/1/03	44.0	J
TMW23	RDX	4/1/03	45.0	DJ
TMW23	Nitrate-N	10/10/02	27100	J
TMW23	Nitrate-N	4/1/03	39400	
TMW23	Nitrate-N	4/1/03	36300	DJ
TMW23	Nitrite-N by Calculation	4/1/03	4400	
TMW23	Nitrite-N by Calculation	4/1/03	5900	D
TMW23	beta-BHC	4/1/03	0.0391	D
TMW23	DDT	4/1/03	0.0136	J
TMW23	Heptachlor Epoxide	4/1/03	0.0149	J
TMW23	Heptachlor Epoxide	4/1/03	0.0196	DJ
TMW23	Lindane	4/1/03	0.0138	J
TMW23	Lindane	4/1/03	0.0138	DJ
TMW23	Aluminum	10/10/02	5180	
TMW23	Aluminum	4/1/03	146000	
TMW23	Aluminum	4/1/03	185000	D
TMW23	Antimony	4/1/03	0.942	FJ
TMW23	Arsenic	10/10/02	1.62	FJ
TMW23	Arsenic	10/10/02	1.82	J
TMW23	Arsenic	4/1/03	3.75	
TMW23	Arsenic	4/1/03	4.51	D
TMW23	Barium	10/10/02	25.3	F
TMW23	Barium	4/1/03	23.6	FJ
TMW23	Barium	4/1/03	50.3	DFJ
TMW23	Barium	10/10/02	65.4	
TMW23	Barium	4/1/03	1080	J
TMW23	Barium	4/1/03	1410	DJ
TMW23	Beryllium	4/1/03	6.04	D
TMW23	Beryllium	4/1/03	4.86	J
TMW23	Cadmium	10/10/02	0.0679	FJ
TMW23	Calcium	10/10/02	28100	F
TMW23	Calcium	4/1/03	19200	F
TMW23	Calcium	4/1/03	20700	DF
TMW23	Calcium	10/10/02	27500	
TMW23	Calcium	4/1/03	76800	
TMW23	Calcium	4/1/03	88900	D
TMW23	Chromium	4/1/03	86.5	
TMW23	Chromium	4/1/03	108	D

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW23	Cobalt	10/10/02	0.250	FJ
TMW23	Cobalt	4/1/03	0.320	FJ
TMW23	Cobalt	4/1/03	0.764	DFJ
TMW23	Cobalt	10/10/02	0.848	J
TMW23	Cobalt	4/1/03	11.5	
TMW23	Cobalt	4/1/03	13.7	D
TMW23	Copper	10/10/02	9.54	FJ
TMW23	Copper	4/1/03	30.3	
TMW23	Copper	4/1/03	39.5	D
TMW23	Iron	10/10/02	350	F
TMW23	Iron	10/10/02	2720	
TMW23	Iron	4/1/03	76600	
TMW23	Iron	4/1/03	96800	D
TMW23	Lead	4/1/03	0.963	DFJ
TMW23	Lead	10/10/02	1.31	J
TMW23	Lead	4/1/03	26.4	
TMW23	Lead	4/1/03	31.9	D
TMW23	Magnesium	10/10/02	8480	F
TMW23	Magnesium	4/1/03	5070	F
TMW23	Magnesium	4/1/03	6040	DF
TMW23	Magnesium	10/10/02	8530	
TMW23	Magnesium	4/1/03	39400	
TMW23	Magnesium	4/1/03	48500	D
TMW23	Manganese	10/10/02	91.6	F
TMW23	Manganese	4/1/03	47.8	FJ
TMW23	Manganese	4/1/03	77.2	DFJ
TMW23	Manganese	10/10/02	131	
TMW23	Manganese	4/1/03	1560	
TMW23	Manganese	4/1/03	1910	D
TMW23	Mercury	4/1/03	0.0607	J
TMW23	Mercury	4/1/03	0.0682	DJ
TMW23	Nickel	4/1/03	59.9	
TMW23	Nickel	4/1/03	72.3	D
TMW23	Potassium	10/10/02	1520	FJ
TMW23	Potassium	4/1/03	760	FJ
TMW23	Potassium	4/1/03	1540	DFJ
TMW23	Potassium	10/10/02	2380	J
TMW23	Potassium	4/1/03	30600	
TMW23	Potassium	4/1/03	39300	D
TMW23	Selenium	10/10/02	0.917	FJ
TMW23	Selenium	4/1/03	0.880	FJ
TMW23	Selenium	4/1/03	0.962	DFJ
TMW23	Selenium	10/10/02	1.33	J
TMW23	Silver	4/1/03	3.81	DJ

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW23	Silver	4/1/03	4.83	J
TMW23	Sodium	10/10/02	721000	F
TMW23	Sodium	4/1/03	693000	F
TMW23	Sodium	4/1/03	718000	DF
TMW23	Sodium	10/10/02	713000	
TMW23	Sodium	4/1/03	707000	
TMW23	Sodium	4/1/03	730000	D
TMW23	Thallium	10/10/02	0.0725	J
TMW23	Thallium	4/1/03	0.241	J
TMW23	Thallium	4/1/03	0.299	DJ
TMW23	Vanadium	4/1/03	6.61	DFJ
TMW23	Vanadium	10/10/02	2.27	FJ
TMW23	Vanadium	4/1/03	172	
TMW23	Vanadium	4/1/03	220	D
TMW23	Vanadium	10/10/02	5.43	J
TMW23	Zinc	4/1/03	2.45	FJ
TMW23	Zinc	4/1/03	7.48	DFJ
TMW23	Zinc	10/10/02	13.8	F
TMW23	Zinc	4/1/03	158	
TMW23	Zinc	4/1/03	193	D
TMW24	beta-BHC	3/28/03	0.0109	J
TMW24	Lindane	3/28/03	0.00287	J
TMW24	Aluminum	3/28/03	12400	F
TMW24	Aluminum	10/10/02	1750	
TMW24	Aluminum	3/28/03	21900	
TMW24	Antimony	10/10/02	0.480	FJ
TMW24	Antimony	10/10/02	0.557	J
TMW24	Arsenic	10/10/02	2.03	FJ
TMW24	Arsenic	10/10/02	1.77	J
TMW24	Arsenic	3/28/03	0.752	J
TMW24	Barium	10/10/02	56.1	F
TMW24	Barium	3/28/03	165	F
TMW24	Barium	10/10/02	65.2	
TMW24	Barium	3/28/03	227	
TMW24	Beryllium	3/28/03	0.573	FJ
TMW24	Beryllium	3/28/03	0.817	J
TMW24	Calcium	10/10/02	35900	F
TMW24	Calcium	3/28/03	42500	F
TMW24	Calcium	10/10/02	36700	
TMW24	Calcium	3/28/03	44800	
TMW24	Chromium	3/28/03	15.5	
TMW24	Cobalt	10/10/02	0.352	FJ
TMW24	Cobalt	3/28/03	1.68	FJ
TMW24	Cobalt	10/10/02	0.646	J

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW24	Cobalt	3/28/03	2.55	
TMW24	Copper	3/28/03	7.22	FJ
TMW24	Copper	3/28/03	10.2	J
TMW24	Iron	10/10/02	48.8	FJ
TMW24	Iron	3/28/03	6360	FJ
TMW24	Iron	10/10/02	967	
TMW24	Iron	3/28/03	11300	J
TMW24	Lead	3/28/03	2.41	F
TMW24	Lead	3/28/03	3.99	
TMW24	Magnesium	10/10/02	9550	F
TMW24	Magnesium	3/28/03	12800	F
TMW24	Magnesium	10/10/02	9890	
TMW24	Magnesium	3/28/03	14600	
TMW24	Manganese	10/10/02	216	F
TMW24	Manganese	3/28/03	489	F
TMW24	Manganese	10/10/02	229	
TMW24	Manganese	3/28/03	585	
TMW24	Potassium	10/10/02	1100	FJ
TMW24	Potassium	3/28/03	3700	F
TMW24	Potassium	10/10/02	1550	J
TMW24	Potassium	3/28/03	6050	
TMW24	Selenium	10/10/02	1.10	FJ
TMW24	Selenium	3/28/03	0.649	FJ
TMW24	Selenium	10/10/02	1.00	J
TMW24	Silver	3/28/03	3.51	J
TMW24	Sodium	10/10/02	1010000	F
TMW24	Sodium	3/28/03	912000	F
TMW24	Sodium	10/10/02	1040000	
TMW24	Sodium	3/28/03	913000	
TMW24	Vanadium	3/28/03	9.36	FJ
TMW24	Vanadium	10/10/02	2.73	FJ
TMW24	Vanadium	3/28/03	31.9	J
TMW24	Vanadium	10/10/02	3.71	J
TMW24	Zinc	3/28/03	17.0	FJ
TMW24	Zinc	10/10/02	25.2	F
TMW24	Zinc	3/28/03	32.9	
TMW25	Nitrate-N	10/11/02	989	
TMW25	Nitrate-N	3/26/03	1300	
TMW25	Nitrite-N by Calculation	10/11/02	140	
TMW25	Toluene	3/26/03	0.380	J
TMW25	Aluminum	3/26/03	114	FJ
TMW25	Aluminum	10/11/02	1100	
TMW25	Aluminum	3/26/03	252	
TMW25	Arsenic	10/11/02	1.53	FJ

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW25	Arsenic	10/11/02	1.47	J
TMW25	Barium	10/11/02	18.7	FJ
TMW25	Barium	3/26/03	17.3	FJ
TMW25	Barium	10/11/02	24.8	
TMW25	Barium	3/26/03	19.0	J
TMW25	Calcium	10/11/02	62800	F
TMW25	Calcium	3/26/03	59900	F
TMW25	Calcium	10/11/02	62400	
TMW25	Calcium	3/26/03	61000	
TMW25	Cobalt	10/11/02	0.351	FJ
TMW25	Cobalt	3/26/03	0.302	FJ
TMW25	Cobalt	10/11/02	0.376	J
TMW25	Cobalt	3/26/03	0.323	J
TMW25	Copper	10/11/02	9.47	J
TMW25	Iron	10/11/02	50.2	F
TMW25	Iron	10/11/02	839	
TMW25	Lead	3/26/03	0.310	FJ
TMW25	Lead	3/26/03	0.242	J
TMW25	Magnesium	10/11/02	13200	F
TMW25	Magnesium	3/26/03	12900	F
TMW25	Magnesium	10/11/02	13500	
TMW25	Magnesium	3/26/03	13200	
TMW25	Manganese	10/11/02	114	F
TMW25	Manganese	3/26/03	95.6	F
TMW25	Manganese	10/11/02	121	
TMW25	Manganese	3/26/03	103	
TMW25	Potassium	10/11/02	528	FJ
TMW25	Potassium	10/11/02	763	J
TMW25	Selenium	10/11/02	1.70	FJ
TMW25	Selenium	10/11/02	1.45	J
TMW25	Sodium	10/11/02	1070000	F
TMW25	Sodium	3/26/03	906000	F
TMW25	Sodium	10/11/02	1050000	
TMW25	Sodium	3/26/03	921000	
TMW25	Vanadium	10/11/02	3.69	FJ
TMW25	Vanadium	10/11/02	3.59	J
TMW25	Zinc	3/26/03	11.2	FJ
TMW25	Zinc	3/26/03	5.70	J
TMW26	Toluene	10/9/02	1.20	J
TMW26	DDT	3/28/03	0.0686	
TMW26	Endosulfan I	3/28/03	0.00313	J
TMW26	Endosulfan II	3/28/03	0.00298	J
TMW26	Endosulfan Sulfate	3/28/03	0.00560	J
TMW26	Endrin	3/28/03	0.0112	J

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
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Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW26	Aluminum	10/9/02	68.9	FJ
TMW26	Aluminum	3/28/03	5040	F
TMW26	Aluminum	10/9/02	1140	
TMW26	Aluminum	3/28/03	35800	
TMW26	Arsenic	10/9/02	2.02	FJ
TMW26	Arsenic	10/9/02	1.63	J
TMW26	Arsenic	3/28/03	1.39	J
TMW26	Barium	10/9/02	16.3	FJ
TMW26	Barium	3/28/03	97.6	F
TMW26	Barium	10/9/02	31.8	
TMW26	Barium	3/28/03	1060	
TMW26	Beryllium	3/28/03	1.45	J
TMW26	Calcium	10/9/02	31400	F
TMW26	Calcium	3/28/03	24600	F
TMW26	Calcium	10/9/02	34000	
TMW26	Calcium	3/28/03	65200	
TMW26	Chromium	3/28/03	26.6	
TMW26	Cobalt	10/9/02	0.469	FJ
TMW26	Cobalt	3/28/03	1.02	FJ
TMW26	Cobalt	10/9/02	0.717	J
TMW26	Cobalt	3/28/03	3.97	
TMW26	Copper	3/28/03	7.27	FJ
TMW26	Copper	3/28/03	16.2	J
TMW26	Iron	10/9/02	93.0	F
TMW26	Iron	3/28/03	2540	FJ
TMW26	Iron	10/9/02	577	
TMW26	Iron	3/28/03	19800	J
TMW26	Lead	3/28/03	1.19	FJ
TMW26	Lead	3/28/03	6.45	
TMW26	Magnesium	10/9/02	12400	F
TMW26	Magnesium	3/28/03	10100	F
TMW26	Magnesium	10/9/02	13300	
TMW26	Magnesium	3/28/03	18700	
TMW26	Manganese	10/9/02	137	F
TMW26	Manganese	3/28/03	188	F
TMW26	Manganese	10/9/02	173	
TMW26	Manganese	3/28/03	697	
TMW26	Nickel	3/28/03	15.5	J
TMW26	Potassium	10/9/02	1320	FJ
TMW26	Potassium	3/28/03	2160	FJ
TMW26	Potassium	10/9/02	1620	J
TMW26	Potassium	3/28/03	8780	
TMW26	Selenium	10/9/02	1.81	FJ
TMW26	Selenium	10/9/02	1.22	J

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW26	Selenium	3/28/03	0.698	J
TMW26	Sodium	10/9/02	1160000	F
TMW26	Sodium	3/28/03	936000	F
TMW26	Sodium	10/9/02	1190000	
TMW26	Sodium	3/28/03	947000	
TMW26	Vanadium	3/28/03	10.9	FJ
TMW26	Vanadium	10/9/02	3.81	FJ
TMW26	Vanadium	3/28/03	45.2	J
TMW26	Vanadium	10/9/02	4.91	J
TMW26	Zinc	3/28/03	13.7	FJ
TMW26	Zinc	3/28/03	45.5	
TMW27	Toluene	10/8/02	0.470	J
TMW27	Toluene	10/8/02	0.520	DJ
TMW27	Aluminum	10/8/02	855	D
TMW27	Aluminum	10/8/02	1080	
TMW27	Aluminum	3/26/03	1790	
TMW27	Arsenic	10/8/02	12.8	F
TMW27	Arsenic	10/8/02	13.0	DF
TMW27	Arsenic	3/26/03	11.6	F
TMW27	Arsenic	10/8/02	13.0	
TMW27	Arsenic	10/8/02	13.0	D
TMW27	Arsenic	3/26/03	12.3	
TMW27	Barium	10/8/02	95.7	DF
TMW27	Barium	10/8/02	96.6	F
TMW27	Barium	3/26/03	88.5	F
TMW27	Barium	10/8/02	101	D
TMW27	Barium	10/8/02	102	
TMW27	Barium	3/26/03	103	
TMW27	Calcium	10/8/02	26700	DF
TMW27	Calcium	10/8/02	27000	F
TMW27	Calcium	3/26/03	23500	F
TMW27	Calcium	10/8/02	26500	D
TMW27	Calcium	10/8/02	27000	
TMW27	Calcium	3/26/03	23800	
TMW27	Cobalt	10/8/02	0.456	FJ
TMW27	Cobalt	10/8/02	0.458	DFJ
TMW27	Cobalt	3/26/03	0.394	FJ
TMW27	Cobalt	10/8/02	0.519	DJ
TMW27	Cobalt	10/8/02	0.552	J
TMW27	Cobalt	3/26/03	0.659	J
TMW27	Iron	10/8/02	89.1	DFJ
TMW27	Iron	10/8/02	171	FJ
TMW27	Iron	10/8/02	557	D
TMW27	Iron	10/8/02	658	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW27	Iron	3/26/03	1190	
TMW27	Lead	3/26/03	0.185	FJ
TMW27	Lead	3/26/03	0.525	J
TMW27	Magnesium	10/8/02	7240	DF
TMW27	Magnesium	10/8/02	7310	F
TMW27	Magnesium	3/26/03	6400	F
TMW27	Magnesium	10/8/02	7260	D
TMW27	Magnesium	10/8/02	7350	
TMW27	Magnesium	3/26/03	6730	
TMW27	Manganese	10/8/02	586	F
TMW27	Manganese	10/8/02	586	DF
TMW27	Manganese	3/26/03	523	F
TMW27	Manganese	10/8/02	581	D
TMW27	Manganese	10/8/02	586	
TMW27	Manganese	3/26/03	538	
TMW27	Mercury	3/26/03	0.0254	FJ
TMW27	Mercury	3/26/03	0.0316	J
TMW27	Potassium	10/8/02	828	DFJ
TMW27	Potassium	10/8/02	837	FJ
TMW27	Potassium	10/8/02	983	DJ
TMW27	Potassium	10/8/02	1060	J
TMW27	Selenium	10/8/02	0.678	DJ
TMW27	Sodium	10/8/02	439000	F
TMW27	Sodium	10/8/02	446000	DF
TMW27	Sodium	3/26/03	386000	F
TMW27	Sodium	10/8/02	433000	
TMW27	Sodium	10/8/02	438000	D
TMW27	Sodium	3/26/03	382000	
TMW27	Thallium	3/26/03	0.0387	J
TMW27	Vanadium	10/8/02	1.21	FJ
TMW27	Vanadium	10/8/02	1.31	DFJ
TMW27	Vanadium	10/8/02	1.63	DJ
TMW27	Vanadium	10/8/02	1.74	J
TMW27	Zinc	3/26/03	4.70	FJ
TMW27	Zinc	3/26/03	5.85	J
TMW28	Aluminum	3/26/03	548	F
TMW28	Aluminum	10/7/02	6940	
TMW28	Aluminum	3/26/03	1880	
TMW28	Antimony	10/7/02	0.429	FJ
TMW28	Antimony	10/7/02	0.976	J
TMW28	Arsenic	10/7/02	1.16	FJ
TMW28	Arsenic	10/7/02	1.26	J
TMW28	Barium	10/7/02	49.3	F
TMW28	Barium	3/26/03	45.0	F

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW28	Barium	10/7/02	91.1	
TMW28	Barium	3/26/03	50.4	
TMW28	Beryllium	10/7/02	0.351	J
TMW28	Calcium	10/7/02	82500	F
TMW28	Calcium	3/26/03	95100	F
TMW28	Calcium	10/7/02	83600	
TMW28	Calcium	3/26/03	96400	
TMW28	Cobalt	10/7/02	1.06	FJ
TMW28	Cobalt	3/26/03	1.05	FJ
TMW28	Cobalt	10/7/02	1.77	J
TMW28	Cobalt	3/26/03	1.24	J
TMW28	Iron	10/7/02	385	F
TMW28	Iron	10/7/02	3560	
TMW28	Iron	3/26/03	980	
TMW28	Lead	3/26/03	0.255	FJ
TMW28	Lead	10/7/02	1.30	J
TMW28	Lead	3/26/03	0.542	J
TMW28	Magnesium	10/7/02	25300	F
TMW28	Magnesium	3/26/03	29500	F
TMW28	Magnesium	10/7/02	27700	
TMW28	Magnesium	3/26/03	29800	
TMW28	Manganese	10/7/02	298	F
TMW28	Manganese	3/26/03	226	F
TMW28	Manganese	10/7/02	331	
TMW28	Manganese	3/26/03	230	
TMW28	Potassium	10/7/02	1070	FJ
TMW28	Potassium	10/7/02	2430	J
TMW28	Sodium	10/7/02	204000	F
TMW28	Sodium	3/26/03	182000	F
TMW28	Sodium	10/7/02	207000	
TMW28	Sodium	3/26/03	179000	
TMW28	Vanadium	10/7/02	0.691	FJ
TMW28	Vanadium	3/26/03	4.36	J
TMW28	Vanadium	10/7/02	3.94	J
TMW28	Zinc	3/26/03	5.86	J
TMW29	Nitrate-N	10/16/02	3580	
TMW29	Nitrate-N	3/28/03	5300	
TMW29	Nitrite-N by Calculation	10/16/02	559	
TMW29	Nitrite-N by Calculation	3/28/03	1900	
TMW29	Aluminum	10/16/02	52.7	FJ
TMW29	Aluminum	3/28/03	1120	F
TMW29	Aluminum	10/16/02	12300	
TMW29	Aluminum	3/28/03	25000	
TMW29	Arsenic	10/16/02	10.4	F

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW29	Arsenic	3/28/03	4.98	F
TMW29	Arsenic	10/16/02	11.2	
TMW29	Arsenic	3/28/03	5.81	
TMW29	Barium	10/16/02	12.1	FJ
TMW29	Barium	3/28/03	20.9	F
TMW29	Barium	10/16/02	86.8	
TMW29	Barium	3/28/03	180	
TMW29	Beryllium	10/16/02	0.361	J
TMW29	Beryllium	3/28/03	0.717	J
TMW29	Calcium	10/16/02	27300	F
TMW29	Calcium	3/28/03	29900	F
TMW29	Calcium	10/16/02	34800	
TMW29	Calcium	3/28/03	47600	
TMW29	Chromium	10/16/02	15.1	F
TMW29	Chromium	3/28/03	18.0	
TMW29	Chromium	10/16/02	17.6	
TMW29	Cobalt	10/16/02	0.242	FJ
TMW29	Cobalt	3/28/03	0.351	FJ
TMW29	Cobalt	10/16/02	1.82	J
TMW29	Cobalt	3/28/03	3.42	
TMW29	Copper	3/28/03	6.54	J
TMW29	Iron	10/16/02	29.3	FJ
TMW29	Iron	3/28/03	555	F
TMW29	Iron	10/16/02	5750	
TMW29	Iron	3/28/03	12500	
TMW29	Lead	3/28/03	0.370	FJ
TMW29	Lead	10/16/02	3.09	
TMW29	Lead	3/28/03	5.92	
TMW29	Magnesium	10/16/02	2260	F
TMW29	Magnesium	3/28/03	3470	F
TMW29	Magnesium	10/16/02	5300	
TMW29	Magnesium	3/28/03	9830	
TMW29	Manganese	10/16/02	1.34	FJ
TMW29	Manganese	3/28/03	12.2	F
TMW29	Manganese	10/16/02	128	
TMW29	Manganese	3/28/03	280	
TMW29	Nickel	3/28/03	19.2	J
TMW29	Potassium	10/16/02	1820	FJ
TMW29	Potassium	3/28/03	1250	FJ
TMW29	Potassium	10/16/02	3850	
TMW29	Potassium	3/28/03	6300	
TMW29	Selenium	10/16/02	14.9	F
TMW29	Selenium	3/28/03	20.9	F
TMW29	Selenium	10/16/02	14.9	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW29	Selenium	3/28/03	20.3	
TMW29	Sodium	10/16/02	406000	F
TMW29	Sodium	3/28/03	453000	F
TMW29	Sodium	10/16/02	408000	
TMW29	Sodium	3/28/03	457000	
TMW29	Thallium	3/28/03	0.0275	FJ
TMW29	Thallium	10/16/02	0.0689	J
TMW29	Thallium	3/28/03	0.0839	J
TMW29	Vanadium	3/28/03	14.2	FJ
TMW29	Vanadium	10/16/02	26.7	F
TMW29	Vanadium	3/28/03	42.3	J
TMW29	Vanadium	10/16/02	33.4	
TMW29	Zinc	3/28/03	33.3	
TMW29	Zinc	10/16/02	16.4	
WINGATE89	Aluminum	3/25/03	927	F
WINGATE89	Aluminum	11/1/02	17400	
WINGATE89	Aluminum	3/25/03	2750	
WINGATE89	Arsenic	11/1/02	0.444	FJ
WINGATE89	Arsenic	11/1/02	2.35	J
WINGATE89	Barium	11/1/02	263	F
WINGATE89	Barium	3/25/03	209	F
WINGATE89	Barium	11/1/02	517	
WINGATE89	Barium	3/25/03	263	
WINGATE89	Cadmium	11/1/02	0.327	J
WINGATE89	Cadmium	3/25/03	0.114	J
WINGATE89	Calcium	11/1/02	25900	F
WINGATE89	Calcium	3/25/03	25500	F
WINGATE89	Calcium	11/1/02	56000	
WINGATE89	Calcium	3/25/03	28600	
WINGATE89	Chromium	11/1/02	9.78	
WINGATE89	Cobalt	11/1/02	0.254	FJ
WINGATE89	Cobalt	3/25/03	0.244	FJ
WINGATE89	Cobalt	11/1/02	1.98	J
WINGATE89	Cobalt	3/25/03	0.532	J
WINGATE89	Copper	11/1/02	70.1	
WINGATE89	Copper	3/25/03	7.22	J
WINGATE89	Iron	11/1/02	46.4	FJ
WINGATE89	Iron	3/25/03	2440	F
WINGATE89	Iron	11/1/02	21000	
WINGATE89	Iron	3/25/03	5550	
WINGATE89	Lead	3/25/03	0.971	FJ
WINGATE89	Lead	11/1/02	14.9	
WINGATE89	Lead	3/25/03	3.37	
WINGATE89	Magnesium	11/1/02	5500	F

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
WINGATE89	Magnesium	3/25/03	5670	F
WINGATE89	Magnesium	11/1/02	11200	
WINGATE89	Magnesium	3/25/03	6470	
WINGATE89	Manganese	11/1/02	149	F
WINGATE89	Manganese	3/25/03	151	F
WINGATE89	Manganese	11/1/02	525	
WINGATE89	Manganese	3/25/03	205	
WINGATE89	Potassium	11/1/02	2780	FJ
WINGATE89	Potassium	3/25/03	4600	F
WINGATE89	Potassium	11/1/02	7410	
WINGATE89	Potassium	3/25/03	4450	
WINGATE89	Sodium	11/1/02	271000	F
WINGATE89	Sodium	3/25/03	224000	F
WINGATE89	Sodium	11/1/02	268000	
WINGATE89	Sodium	3/25/03	244000	
WINGATE89	Thallium	3/25/03	0.0396	J
WINGATE89	Vanadium	11/1/02	2.84	FJ
WINGATE89	Vanadium	3/25/03	6.75	J
WINGATE89	Vanadium	11/1/02	13.6	
WINGATE89	Zinc	3/25/03	11.7	FJ
WINGATE89	Zinc	3/25/03	18.6	J
WINGATE89	Zinc	11/1/02	68.3	
WINGATE90	Aluminum	10/31/02	5950	
WINGATE90	Aluminum	10/31/02	6590	D
WINGATE90	Antimony	10/31/02	0.519	DFJ
WINGATE90	Antimony	10/31/02	0.364	DJ
WINGATE90	Antimony	10/31/02	1.13	J
WINGATE90	Barium	10/31/02	140	DF
WINGATE90	Barium	10/31/02	142	F
WINGATE90	Barium	10/31/02	203	
WINGATE90	Barium	10/31/02	209	D
WINGATE90	Beryllium	10/31/02	0.373	DJ
WINGATE90	Cadmium	10/31/02	0.0674	J
WINGATE90	Calcium	10/31/02	10400	DF
WINGATE90	Calcium	10/31/02	10500	F
WINGATE90	Calcium	10/31/02	14300	
WINGATE90	Calcium	10/31/02	14500	D
WINGATE90	Chromium	10/31/02	3.40	J
WINGATE90	Chromium	10/31/02	4.44	DJ
WINGATE90	Cobalt	10/31/02	0.156	FJ
WINGATE90	Cobalt	10/31/02	0.186	DFJ
WINGATE90	Cobalt	10/31/02	0.845	DJ
WINGATE90	Cobalt	10/31/02	0.884	J
WINGATE90	Iron	10/31/02	23.4	FJ

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
WINGATE90	Iron	10/31/02	6210	
WINGATE90	Iron	10/31/02	6860	D
WINGATE90	Lead	10/31/02	2.29	
WINGATE90	Lead	10/31/02	2.62	D
WINGATE90	Magnesium	10/31/02	3070	DF
WINGATE90	Magnesium	10/31/02	3080	F
WINGATE90	Magnesium	10/31/02	4720	D
WINGATE90	Magnesium	10/31/02	4790	
WINGATE90	Manganese	10/31/02	76.7	DF
WINGATE90	Manganese	10/31/02	79.2	F
WINGATE90	Manganese	10/31/02	159	
WINGATE90	Manganese	10/31/02	166	D
WINGATE90	Potassium	10/31/02	421	DFJ
WINGATE90	Potassium	10/31/02	438	FJ
WINGATE90	Potassium	10/31/02	2050	J
WINGATE90	Potassium	10/31/02	2160	DJ
WINGATE90	Sodium	10/31/02	280000	DF
WINGATE90	Sodium	10/31/02	281000	F
WINGATE90	Sodium	10/31/02	277000	D
WINGATE90	Sodium	10/31/02	280000	
WINGATE90	Vanadium	10/31/02	2.10	FJ
WINGATE90	Vanadium	10/31/02	2.11	DFJ
WINGATE90	Vanadium	10/31/02	5.01	J
WINGATE90	Vanadium	10/31/02	5.40	DJ
WINGATE91	Antimony	3/25/03	0.928	J
WINGATE91	Arsenic	10/30/02	3.46	F
WINGATE91	Arsenic	3/25/03	1.62	FJ
WINGATE91	Arsenic	10/30/02	3.49	
WINGATE91	Arsenic	3/25/03	1.78	J
WINGATE91	Barium	10/30/02	68.7	F
WINGATE91	Barium	3/25/03	50.6	F
WINGATE91	Barium	10/30/02	70.2	
WINGATE91	Barium	3/25/03	65.4	
WINGATE91	Calcium	10/30/02	12600	F
WINGATE91	Calcium	3/25/03	12500	F
WINGATE91	Calcium	10/30/02	12500	
WINGATE91	Calcium	3/25/03	13800	
WINGATE91	Cobalt	10/30/02	0.104	FJ
WINGATE91	Cobalt	3/25/03	0.0865	FJ
WINGATE91	Cobalt	10/30/02	0.103	J
WINGATE91	Cobalt	3/25/03	0.162	J
WINGATE91	Iron	10/30/02	607	F
WINGATE91	Iron	3/25/03	379	F
WINGATE91	Iron	10/30/02	766	

Table 8
Detected Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
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Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
WINGATE91	Iron	3/25/03	3100	
WINGATE91	Lead	3/25/03	0.193	FJ
WINGATE91	Lead	3/25/03	2.85	
WINGATE91	Magnesium	10/30/02	3320	F
WINGATE91	Magnesium	3/25/03	3290	F
WINGATE91	Magnesium	10/30/02	3260	
WINGATE91	Magnesium	3/25/03	3250	
WINGATE91	Manganese	10/30/02	56.8	F
WINGATE91	Manganese	3/25/03	45.7	F
WINGATE91	Manganese	10/30/02	58.7	
WINGATE91	Manganese	3/25/03	70.5	
WINGATE91	Potassium	10/30/02	1030	FJ
WINGATE91	Potassium	3/25/03	913	FJ
WINGATE91	Potassium	10/30/02	901	J
WINGATE91	Potassium	3/25/03	601	J
WINGATE91	Selenium	10/30/02	0.737	FJ
WINGATE91	Sodium	10/30/02	286000	F
WINGATE91	Sodium	3/25/03	279000	F
WINGATE91	Sodium	10/30/02	284000	
WINGATE91	Sodium	3/25/03	276000	
WINGATE91	Thallium	3/25/03	0.0658	J
WINGATE91	Vanadium	10/30/02	1.60	FJ
WINGATE91	Vanadium	10/30/02	1.70	J
WINGATE91	Zinc	3/25/03	2.94	FJ
WINGATE91	Zinc	3/25/03	7.63	J

Notes:

ug/l - micrograms per liter

Flag Codes

J - Value is estimated

F - Sample filtered prior to analysis

D - Duplicate analysis

Table 9
Ground Water Field Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value	Units	Flag Codes
FW10	Conductivity - field	10/19/02	8405	UMHC	
FW10	Conductivity - field	4/3/03	7290	UMHC	
FW10	Dissolved Oxygen - field	10/19/02	4.29	MGL	
FW10	Dissolved Oxygen - field	4/3/03	6.43	MGL	
FW10	pH - field	10/19/02	7.66	PH UNITS	
FW10	pH - field	4/3/03	7.43	PH UNITS	
FW10	Redox Potential - field	10/19/02	255.1	MV	
FW10	Redox Potential - field	4/3/03	337.1	MV	
FW10	Temperature - field	10/19/02	15.76	C	
FW10	Temperature - field	4/3/03	13.19	C	
FW10	Turbidity - field	10/19/02	7.90	NTU	
FW10	Turbidity - field	4/3/03	11.1	NTU	
MW-1	Conductivity - field	10/16/02	4081	UMHC	
MW-1	Conductivity - field	4/1/03	3820	UMHC	
MW-1	Dissolved Oxygen - field	10/16/02	2.57	MGL	
MW-1	Dissolved Oxygen - field	4/1/03	1.36	MGL	
MW-1	pH - field	10/16/02	7.33	PH UNITS	
MW-1	pH - field	4/1/03	7.36	PH UNITS	
MW-1	Redox Potential - field	10/16/02	245.1	MV	
MW-1	Redox Potential - field	4/1/03	80.0	MV	
MW-1	Temperature - field	10/16/02	12.67	C	
MW-1	Temperature - field	4/1/03	15.33	C	
MW-1	Turbidity - field	10/16/02	60.0	NTU	
MW-1	Turbidity - field	4/1/03	170	NTU	
MW-2	Conductivity - field	10/15/02	2023	UMHC	
MW-2	Conductivity - field	4/1/03	1998	UMHC	
MW-2	Dissolved Oxygen - field	10/15/02	2.09	MGL	
MW-2	Dissolved Oxygen - field	4/1/03	0.890	MGL	
MW-2	pH - field	10/15/02	6.56	PH UNITS	
MW-2	pH - field	4/1/03	6.78	PH UNITS	
MW-2	Redox Potential - field	10/15/02	330.3	MV	
MW-2	Redox Potential - field	4/1/03	24.7	MV	
MW-2	Temperature - field	10/15/02	18.65	C	
MW-2	Temperature - field	4/1/03	15.43	C	
MW-2	Turbidity - field	10/15/02	45.0	NTU	
MW-2	Turbidity - field	4/1/03	25.0	NTU	
MW-3	Conductivity - field	10/16/02	5712	UMHC	
MW-3	Conductivity - field	3/31/03	4927	UMHC	
MW-3	Dissolved Oxygen - field	10/16/02	2.66	MGL	
MW-3	Dissolved Oxygen - field	3/31/03	1.01	MGL	
MW-3	pH - field	10/16/02	6.97	PH UNITS	
MW-3	pH - field	3/31/03	7.12	PH UNITS	
MW-3	Redox Potential - field	10/16/02	333.2	MV	
MW-3	Redox Potential - field	3/31/03	60.7	MV	

Table 9
Ground Water Field Parameters
First Unconsolidated Water-Bearing Zone
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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
MW-3	Temperature - field	10/16/02	16.06	C	
MW-3	Temperature - field	3/31/03	15.53	C	
MW-3	Turbidity - field	10/16/02	21.0	NTU	
MW-3	Turbidity - field	3/31/03	30.0	NTU	
MW18D	Conductivity - field	10/16/02	8146	UMHC	
MW18D	Conductivity - field	3/28/03	8435	UMHC	
MW18D	Dissolved Oxygen - field	10/16/02	5.81	MGL	
MW18D	Dissolved Oxygen - field	3/28/03	1.61	MGL	
MW18D	pH - field	10/16/02	7.54	PH UNITS	
MW18D	pH - field	3/28/03	7.27	PH UNITS	
MW18D	Redox Potential - field	10/16/02	223.2	MV	
MW18D	Redox Potential - field	3/28/03	176.3	MV	
MW18D	Temperature - field	10/16/02	15.42	C	
MW18D	Temperature - field	3/28/03	6.97	C	
MW18D	Turbidity - field	10/16/02	130	NTU	
MW18D	Turbidity - field	3/28/03	5.20	NTU	
MW20	Conductivity - field	10/15/02	20377	UMHC	
MW20	Conductivity - field	3/28/03	20251	UMHC	
MW20	Dissolved Oxygen - field	10/15/02	2.37	MGL	
MW20	Dissolved Oxygen - field	3/28/03	3.05	MGL	
MW20	pH - field	10/15/02	6.58	PH UNITS	
MW20	pH - field	3/28/03	6.79	PH UNITS	
MW20	Redox Potential - field	10/15/02	294.1	MV	
MW20	Redox Potential - field	3/28/03	160	MV	
MW20	Temperature - field	10/15/02	14.03	C	
MW20	Temperature - field	3/28/03	13.08	C	
MW20	Turbidity - field	10/15/02	9.00	NTU	
MW20	Turbidity - field	3/28/03	0.250	NTU	
MW22D	Conductivity - field	10/11/02	6227	UMHC	
MW22D	Conductivity - field	3/31/03	5508	UMHC	
MW22D	Dissolved Oxygen - field	3/31/03	1.21	MGL	
MW22D	pH - field	10/11/02	6.72	PH UNITS	
MW22D	pH - field	3/31/03	7.07	PH UNITS	
MW22D	Redox Potential - field	10/11/02	329.9	MV	
MW22D	Redox Potential - field	3/31/03	93.0	MV	
MW22D	Temperature - field	10/11/02	16.6	C	
MW22D	Temperature - field	3/31/03	15.4	C	
MW22D	Turbidity - field	10/11/02	6.50	NTU	
MW22D	Turbidity - field	3/31/03	12.0	NTU	
MW22S	Conductivity - field	10/16/02	4174	UMHC	
MW22S	Conductivity - field	4/3/03	4082	UMHC	
MW22S	Dissolved Oxygen - field	10/16/02	6.04	MGL	
MW22S	Dissolved Oxygen - field	4/3/03	5.67	MGL	
MW22S	pH - field	10/16/02	7.40	PH UNITS	

Table 9
Ground Water Field Parameters
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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
MW22S	pH - field	4/3/03	7.06	PH UNITS	
MW22S	Redox Potential - field	10/16/02	206.2	MV	
MW22S	Redox Potential - field	4/3/03	349.4	MV	
MW22S	Temperature - field	10/16/02	16.01	C	
MW22S	Temperature - field	4/3/03	14.51	C	
MW22S	Turbidity - field	10/16/02	370	NTU	
MW22S	Turbidity - field	4/3/03	115	NTU	
SMW01	Conductivity - field	10/8/02	2363	UMHC	
SMW01	Conductivity - field	3/26/03	2394	UMHC	
SMW01	Dissolved Oxygen - field	10/8/02	1.82	MGL	
SMW01	Dissolved Oxygen - field	3/26/03	1.29	MGL	
SMW01	pH - field	10/8/02	7.46	PH UNITS	
SMW01	pH - field	3/26/03	7.67	PH UNITS	
SMW01	Redox Potential - field	10/8/02	286.3	MV	
SMW01	Redox Potential - field	3/26/03	104.4	MV	
SMW01	Temperature - field	10/8/02	14.84	C	
SMW01	Temperature - field	3/26/03	15.48	C	
SMW01	Turbidity - field	10/8/02	0.00	NTU	
SMW01	Turbidity - field	3/26/03	0.00	NTU	
SUPPLYWELL 54	Conductivity - field	10/24/02	1175	UMHC	
SUPPLYWELL 54	Dissolved Oxygen - field	10/24/02	3.81	MGL	
SUPPLYWELL 54	pH - field	10/24/02	7.84	PH UNITS	
SUPPLYWELL 54	Redox Potential - field	10/24/02	-154.2	MV	
SUPPLYWELL 54	Temperature - field	10/24/02	13.23	C	
SUPPLYWELL 54	Turbidity - field	10/24/02	3.87	NTU	
SUPPLYWELL 55	Conductivity - field	10/24/02	1530	UMHC	
SUPPLYWELL 55	Dissolved Oxygen - field	10/24/02	6.96	MGL	
SUPPLYWELL 55	pH - field	10/24/02	7.67	PH UNITS	
SUPPLYWELL 55	Redox Potential - field	10/24/02	135.5	MV	
SUPPLYWELL 55	Temperature - field	10/24/02	13.13	C	
SUPPLYWELL 55	Turbidity - field	10/24/02	0.00	NTU	
TMW01	Conductivity - field	10/22/02	2857	UMHC	
TMW01	Conductivity - field	4/1/03	2789	UMHC	
TMW01	Dissolved Oxygen - field	10/22/02	3.09	MGL	
TMW01	Dissolved Oxygen - field	4/1/03	0.610	MGL	
TMW01	pH - field	10/22/02	7.25	PH UNITS	
TMW01	pH - field	4/1/03	7.34	PH UNITS	
TMW01	Redox Potential - field	10/22/02	231.9	MV	
TMW01	Redox Potential - field	4/1/03	78.0	MV	
TMW01	Temperature - field	10/22/02	11.99	C	
TMW01	Temperature - field	4/1/03	13.45	C	
TMW01	Turbidity - field	10/22/02	40.0	NTU	
TMW01	Turbidity - field	4/1/03	19.0	NTU	
TMW03	Conductivity - field	10/23/02	4836	UMHC	

Table 9
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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW03	Conductivity - field	4/4/03	4789	UMHC	
TMW03	Dissolved Oxygen - field	10/23/02	7.35	MGL	
TMW03	Dissolved Oxygen - field	4/4/03	1.33	MGL	
TMW03	pH - field	10/23/02	7.49	PH UNITS	
TMW03	pH - field	4/4/03	7.42	PH UNITS	
TMW03	Redox Potential - field	10/23/02	230.7	MV	
TMW03	Redox Potential - field	4/4/03	377.1	MV	
TMW03	Temperature - field	10/23/02	13.23	C	
TMW03	Temperature - field	4/4/03	12.1	C	
TMW03	Turbidity - field	10/23/02	0.00	NTU	
TMW03	Turbidity - field	4/4/03	4.72	NTU	
TMW04	Conductivity - field	10/23/02	4018	UMHC	
TMW04	Conductivity - field	4/4/03	4007	UMHC	
TMW04	Dissolved Oxygen - field	10/23/02	4.45	MGL	
TMW04	Dissolved Oxygen - field	4/4/03	2.05	MGL	
TMW04	pH - field	10/23/02	7.66	PH UNITS	
TMW04	pH - field	4/4/03	7.74	PH UNITS	
TMW04	Redox Potential - field	10/23/02	257.8	MV	
TMW04	Redox Potential - field	4/4/03	36.8	MV	
TMW04	Temperature - field	10/23/02	13.23	C	
TMW04	Temperature - field	4/4/03	12.57	C	
TMW04	Turbidity - field	10/23/02	3.10	NTU	
TMW04	Turbidity - field	4/4/03	4.00	NTU	
TMW06	Conductivity - field	10/18/02	4596	UMHC	
TMW06	Conductivity - field	4/3/03	4586	UMHC	
TMW06	Dissolved Oxygen - field	10/18/02	6.80	MGL	
TMW06	Dissolved Oxygen - field	4/3/03	2.03	MGL	
TMW06	pH - field	10/18/02	7.80	PH UNITS	
TMW06	pH - field	4/3/03	7.38	PH UNITS	
TMW06	Redox Potential - field	10/18/02	215.2	MV	
TMW06	Redox Potential - field	4/3/03	149.3	MV	
TMW06	Temperature - field	10/18/02	12.46	C	
TMW06	Temperature - field	4/3/03	10.9	C	
TMW06	Turbidity - field	10/18/02	38.0	NTU	
TMW06	Turbidity - field	4/3/03	0.00	NTU	
TMW08	Conductivity - field	10/9/02	14857	UMHC	
TMW08	Conductivity - field	3/27/03	14879	UMHC	
TMW08	Dissolved Oxygen - field	3/27/03	0.350	MGL	
TMW08	pH - field	10/9/02	6.83	PH UNITS	
TMW08	pH - field	3/27/03	7.01	PH UNITS	
TMW08	Redox Potential - field	10/9/02	367	MV	
TMW08	Redox Potential - field	3/27/03	358.1	MV	
TMW08	Temperature - field	10/9/02	14.38	C	
TMW08	Temperature - field	3/27/03	11.7	C	

Table 9
Ground Water Field Parameters
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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW08	Turbidity - field	10/9/02	0.500	NTU	
TMW08	Turbidity - field	3/27/03	2.90	NTU	
TMW10	Conductivity - field	10/9/02	9327	UMHC	
TMW10	Conductivity - field	3/27/03	9289	UMHC	
TMW10	Dissolved Oxygen - field	10/9/02	4.52	MGL	
TMW10	Dissolved Oxygen - field	3/27/03	2.39	MGL	
TMW10	pH - field	10/9/02	6.70	PH UNITS	
TMW10	pH - field	3/27/03	7.12	PH UNITS	
TMW10	Redox Potential - field	10/9/02	493.3	MV	
TMW10	Redox Potential - field	3/27/03	350.7	MV	
TMW10	Temperature - field	10/9/02	13.61	C	
TMW10	Temperature - field	3/27/03	10.74	C	
TMW10	Turbidity - field	10/9/02	10.0	NTU	
TMW10	Turbidity - field	3/27/03	9.00	NTU	
TMW11	Conductivity - field	10/18/02	2270	UMHC	
TMW11	Conductivity - field	4/2/03	2224	UMHC	
TMW11	Dissolved Oxygen - field	10/18/02	3.96	MGL	
TMW11	Dissolved Oxygen - field	4/2/03	3.48	MGL	
TMW11	pH - field	10/18/02	7.56	PH UNITS	
TMW11	pH - field	4/2/03	7.60	PH UNITS	
TMW11	Redox Potential - field	10/18/02	228.2	MV	
TMW11	Redox Potential - field	4/2/03	109.4	MV	
TMW11	Temperature - field	10/18/02	13.18	C	
TMW11	Temperature - field	4/2/03	13.24	C	
TMW11	Turbidity - field	10/18/02	45.0	NTU	
TMW11	Turbidity - field	4/2/03	17.0	NTU	
TMW13	Conductivity - field	10/21/02	2404	UMHC	
TMW13	Conductivity - field	3/27/03	2381	UMHC	
TMW13	Dissolved Oxygen - field	10/21/02	8.29	MGL	
TMW13	Dissolved Oxygen - field	3/27/03	1.55	MGL	
TMW13	pH - field	10/21/02	7.29	PH UNITS	
TMW13	pH - field	3/27/03	7.49	PH UNITS	
TMW13	Redox Potential - field	10/21/02	316.6	MV	
TMW13	Redox Potential - field	3/27/03	115.8	MV	
TMW13	Temperature - field	10/21/02	13.12	C	
TMW13	Temperature - field	3/27/03	11.31	C	
TMW13	Turbidity - field	10/21/02	0.330	NTU	
TMW13	Turbidity - field	3/27/03	0.00	NTU	
TMW15	Conductivity - field	10/21/02	2473	UMHC	
TMW15	Conductivity - field	3/27/03	2456	UMHC	
TMW15	Dissolved Oxygen - field	10/21/02	3.78	MGL	
TMW15	Dissolved Oxygen - field	3/27/03	2.62	MGL	
TMW15	pH - field	10/21/02	7.39	PH UNITS	
TMW15	pH - field	3/27/03	7.49	PH UNITS	

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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW15	Redox Potential - field	10/21/02	286.1	MV	
TMW15	Redox Potential - field	3/27/03	93.1	MV	
TMW15	Temperature - field	10/21/02	14.34	C	
TMW15	Temperature - field	3/27/03	11.33	C	
TMW15	Turbidity - field	10/21/02	2.52	NTU	
TMW15	Turbidity - field	3/27/03	0.30	NTU	
TMW21	Conductivity - field	10/17/02	2344	UMHC	
TMW21	Conductivity - field	4/2/03	2456	UMHC	
TMW21	Dissolved Oxygen - field	10/17/02	2.29	MGL	
TMW21	Dissolved Oxygen - field	4/2/03	0.70	MGL	
TMW21	pH - field	10/17/02	7.63	PH UNITS	
TMW21	pH - field	4/2/03	7.68	PH UNITS	
TMW21	Redox Potential - field	10/17/02	235.1	MV	
TMW21	Redox Potential - field	4/2/03	64.5	MV	
TMW21	Temperature - field	10/17/02	13.65	C	
TMW21	Temperature - field	4/2/03	15.28	C	
TMW21	Turbidity - field	10/17/02	255	NTU	
TMW21	Turbidity - field	4/2/03	90.0	NTU	
TMW22	Conductivity - field	10/17/02	2861	UMHC	
TMW22	Conductivity - field	4/1/03	3028	UMHC	
TMW22	Dissolved Oxygen - field	10/17/02	2.73	MGL	
TMW22	Dissolved Oxygen - field	4/1/03	5.58	MGL	
TMW22	pH - field	10/17/02	7.66	PH UNITS	
TMW22	pH - field	4/1/03	7.87	PH UNITS	
TMW22	Redox Potential - field	10/17/02	286.7	MV	
TMW22	Redox Potential - field	4/1/03	288.2	MV	
TMW22	Temperature - field	10/17/02	16.58	C	
TMW22	Temperature - field	4/1/03	14.72	C	
TMW22	Turbidity - field	10/17/02	39.8	NTU	
TMW22	Turbidity - field	4/1/03	999	NTU	J
TMW23	Conductivity - field	10/10/02	3046	UMHC	
TMW23	Conductivity - field	4/1/03	3144	UMHC	
TMW23	Dissolved Oxygen - field	10/10/02	2.32	MGL	
TMW23	Dissolved Oxygen - field	4/1/03	5.63	MGL	
TMW23	pH - field	10/10/02	7.54	PH UNITS	
TMW23	pH - field	4/1/03	7.77	PH UNITS	
TMW23	Redox Potential - field	10/10/02	34.1	MV	
TMW23	Redox Potential - field	4/1/03	306.8	MV	
TMW23	Temperature - field	10/10/02	22.05	C	
TMW23	Temperature - field	4/1/03	12.6	C	
TMW23	Turbidity - field	10/10/02	65.0	NTU	
TMW23	Turbidity - field	4/1/03	999	NTU	J
TMW24	Conductivity - field	10/10/02	4150	UMHC	
TMW24	Conductivity - field	3/28/03	3918	UMHC	

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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW24	Dissolved Oxygen - field	10/10/02	1.69	MGL	
TMW24	Dissolved Oxygen - field	3/28/03	5.52	MGL	
TMW24	pH - field	10/10/02	7.66	PH UNITS	
TMW24	pH - field	3/28/03	7.86	PH UNITS	
TMW24	Redox Potential - field	10/10/02	237.6	MV	
TMW24	Redox Potential - field	3/28/03	166.5	MV	
TMW24	Temperature - field	10/10/02	12.65	C	
TMW24	Temperature - field	3/28/03	11.07	C	
TMW24	Turbidity - field	10/10/02	8.00	NTU	
TMW24	Turbidity - field	3/28/03	671	NTU	
TMW25	Conductivity - field	10/11/02	4316	UMHC	
TMW25	Conductivity - field	3/26/03	4176	UMHC	
TMW25	Dissolved Oxygen - field	10/11/02	1.29	MGL	
TMW25	Dissolved Oxygen - field	3/26/03	0.590	MGL	
TMW25	pH - field	10/11/02	7.42	PH UNITS	
TMW25	pH - field	3/26/03	7.44	PH UNITS	
TMW25	Redox Potential - field	10/11/02	88.2	MV	
TMW25	Redox Potential - field	3/26/03	260.8	MV	
TMW25	Temperature - field	10/11/02	11.83	C	
TMW25	Temperature - field	3/26/03	15.33	C	
TMW25	Turbidity - field	10/11/02	18.0	NTU	
TMW25	Turbidity - field	3/26/03	9.20	NTU	
TMW26	Conductivity - field	10/9/02	4719	UMHC	
TMW26	Conductivity - field	3/28/03	4268	UMHC	
TMW26	Dissolved Oxygen - field	10/9/02	1.61	MGL	
TMW26	Dissolved Oxygen - field	3/28/03	6.36	MGL	
TMW26	pH - field	10/9/02	7.66	PH UNITS	
TMW26	pH - field	3/28/03	7.97	PH UNITS	
TMW26	Redox Potential - field	10/9/02	239.6	MV	
TMW26	Redox Potential - field	3/28/03	148.2	MV	
TMW26	Temperature - field	10/9/02	13.11	C	
TMW26	Temperature - field	3/28/03	11.54	C	
TMW26	Turbidity - field	10/9/02	1100	NTU	J
TMW26	Turbidity - field	3/28/03	837	NTU	
TMW27	Conductivity - field	10/8/02	1748	UMHC	
TMW27	Conductivity - field	3/26/03	1567	UMHC	
TMW27	Dissolved Oxygen - field	10/8/02	2.51	MGL	
TMW27	Dissolved Oxygen - field	3/26/03	0.420	MGL	
TMW27	pH - field	10/8/02	7.36	PH UNITS	
TMW27	pH - field	3/26/03	7.70	PH UNITS	
TMW27	Redox Potential - field	10/8/02	344.8	MV	
TMW27	Redox Potential - field	3/26/03	21.9	MV	
TMW27	Temperature - field	10/8/02	15.53	C	
TMW27	Temperature - field	3/26/03	12.99	C	

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Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW27	Turbidity - field	10/8/02	24.0	NTU	
TMW27	Turbidity - field	3/26/03	20.0	NTU	
TMW28	Conductivity - field	10/7/02	1313	UMHC	
TMW28	Conductivity - field	3/26/03	1323	UMHC	
TMW28	Dissolved Oxygen - field	3/26/03	0.260	MGL	
TMW28	pH - field	10/7/02	6.87	PH UNITS	
TMW28	pH - field	3/26/03	7.12	PH UNITS	
TMW28	Redox Potential - field	10/7/02	-4.10	MV	
TMW28	Redox Potential - field	3/26/03	79.3	MV	
TMW28	Temperature - field	10/7/02	14.13	C	
TMW28	Temperature - field	3/26/03	11.01	C	
TMW28	Turbidity - field	10/7/02	87.0	NTU	
TMW28	Turbidity - field	3/26/03	13.0	NTU	
TMW29	Conductivity - field	10/16/02	2185	UMHC	
TMW29	Conductivity - field	3/28/03	2219	UMHC	
TMW29	Dissolved Oxygen - field	10/16/02	7.20	MGL	
TMW29	Dissolved Oxygen - field	3/28/03	6.70	MGL	
TMW29	pH - field	10/16/02	8.85	PH UNITS	
TMW29	pH - field	3/28/03	8.26	PH UNITS	
TMW29	Redox Potential - field	10/16/02	179	MV	
TMW29	Redox Potential - field	3/28/03	162.1	MV	
TMW29	Temperature - field	10/16/02	13.47	C	
TMW29	Temperature - field	3/28/03	12.43	C	
TMW29	Turbidity - field	10/16/02	600	NTU	
TMW29	Turbidity - field	3/28/03	137	NTU	
WINGATE89	Conductivity - field	11/1/02	1262	UMHC	
WINGATE89	Conductivity - field	3/25/03	1190	UMHC	
WINGATE89	Dissolved Oxygen - field	11/1/02	9.12	MGL	
WINGATE89	Dissolved Oxygen - field	3/25/03	2.44	MGL	
WINGATE89	pH - field	3/25/03	7.93	PH UNITS	
WINGATE89	Redox Potential - field	11/1/02	-277.5	MV	
WINGATE89	Redox Potential - field	3/25/03	-22.7	MV	
WINGATE89	Temperature - field	11/1/02	13.34	C	
WINGATE89	Temperature - field	3/25/03	14.67	C	
WINGATE89	Turbidity - field	11/1/02	230	NTU	
WINGATE89	Turbidity - field	3/25/03	65.0	NTU	
WINGATE90	Conductivity - field	10/31/02	1234	UMHC	
WINGATE90	Dissolved Oxygen - field	10/31/02	8.46	MGL	
WINGATE90	pH - field	10/31/02	8.25	PH UNITS	
WINGATE90	Redox Potential - field	10/31/02	19.0	MV	
WINGATE90	Temperature - field	10/31/02	12.52	C	
WINGATE90	Turbidity - field	10/31/02	40.0	NTU	
WINGATE91	Conductivity - field	10/30/02	1245	UMHC	
WINGATE91	Conductivity - field	3/25/03	1249	UMHC	

Table 9
Ground Water Field Parameters
First Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value	Units	Flag Codes
WINGATE91	Dissolved Oxygen - field	10/30/02	8.47	MGL	
WINGATE91	Dissolved Oxygen - field	3/25/03	4.23	MGL	
WINGATE91	pH - field	10/30/02	8.03	PH UNITS	
WINGATE91	pH - field	3/25/03	8.21	PH UNITS	
WINGATE91	Redox Potential - field	10/30/02	-37.2	MV	
WINGATE91	Redox Potential - field	3/25/03	59.0	MV	
WINGATE91	Temperature - field	10/30/02	13.28	C	
WINGATE91	Temperature - field	3/25/03	12.96	C	
WINGATE91	Turbidity - field	10/30/02	4.70	NTU	
WINGATE91	Turbidity - field	3/25/03	24.0	NTU	

Notes:
UMHC - micromhos per centimeter
MGL - milligrams per liter
PH UNITS - standard pH units
MV - millivolts
C - degrees celcius
NTU - Nephelometric Turbidity Units

Flag Codes
J - Estimated Concentration

Table 10
Detected Parameters
Second Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW07	MNX	10/18/02	0.0740	J
TMW07	Nitrate-N	10/18/02	1050	
TMW07	Nitrite-N by Calculation	10/18/02	175	
TMW07	1,3,5-Trinitrobenzene	4/3/03	0.370	
TMW07	DNX	4/3/03	0.0800	J

Notes:

ug/l - micrograms per liter

Flag Codes

J - Value is estimated

Table 11
Ground Water Field Parameters
Second Unconsolidated Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW07	Conductivity - field	10/18/02	5059	UMHC	
TMW07	Conductivity - field	4/3/03	2755	UMHC	
TMW07	Dissolved Oxygen - field	10/18/02	3.30	MGL	
TMW07	Dissolved Oxygen - field	4/3/03	6.78	MGL	
TMW07	pH - field	10/18/02	8.01	PH UNITS	
TMW07	pH - field	4/3/03	7.75	PH UNITS	
TMW07	Redox Potential - field	10/18/02	228.6	MV	
TMW07	Redox Potential - field	4/3/03	233.4	MV	
TMW07	Temperature - field	10/18/02	12.32	C	
TMW07	Temperature - field	4/3/03	12.24	C	
TMW07	Turbidity - field	10/18/02	50.0	NTU	
TMW07	Turbidity - field	4/3/03	10.0	NTU	

Notes:

UMHC - micromhos per centimeter
MGL - milligrams per liter
PH UNITS - standard pH units
MV - millivolts
C - degrees celcius
NTU - Nephelometric Turbidity Units

Table 12
Detected Parameters
First Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW02	2,4,6-Trinitrotoluene	4/4/03	0.0600	J
TMW02	2,6-Diamino-4-nitrotoluene	10/22/02	16.0	
TMW02	2,6-Diamino-4-nitrotoluene	4/4/03	15.0	
TMW02	2-Nitrotoluene	4/4/03	0.140	J
TMW02	3-Nitrotoluene	4/4/03	0.450	
TMW02	4-Amino-2,6-dinitrotoluene	10/22/02	0.0770	J
TMW02	Nitrobenzene	10/22/02	2.10	
TMW02	RDX	4/4/03	1.40	
TMW02	Nitrate-N	10/22/02	112000	
TMW02	Nitrate-N	4/4/03	103000	J

Notes:

ug/l - micrograms per liter

Flag Codes

J - Value is estimated

Table 13
Ground Water Field Parameters
First Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site Id	Parameter	Collection Date	Value	Units	Flag Codes
TMW02	Conductivity - field	10/22/02	4532	UMHC	
TMW02	Conductivity - field	4/4/03	4508	UMHC	
TMW02	Dissolved Oxygen - field	10/22/02	3.60	MGL	
TMW02	Dissolved Oxygen - field	4/4/03	2.26	MGL	
TMW02	pH - field	10/22/02	7.77	PH UNITS	
TMW02	pH - field	4/4/03	7.85	PH UNITS	
TMW02	Redox Potential - field	10/22/02	229.2	MV	
TMW02	Redox Potential - field	4/4/03	166.3	MV	
TMW02	Temperature - field	10/22/02	13.7	C	
TMW02	Temperature - field	4/4/03	8.22	C	
TMW02	Turbidity - field	10/22/02	3.70	NTU	
TMW02	Turbidity - field	4/4/03	6.40	NTU	

Notes:
UMHC - micromhos per centimeter
MGL - milligrams per liter
PH UNITS - standard pH units
MV - millivolts
C - degrees celcius
NTU - Nephelometric Turbidity Units

Table 14
Detected Parameters
Second Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW05	Nitrate-N	10/15/02	6490	J
TMW05	Nitrate-N	3/31/03	11700	
TMW05	Nitrite-N by Calculation	3/31/03	300	
TMW05	Perchlorate	10/15/02	2890	J
TMW05	Perchlorate	3/31/03	2440	
TMW14A	2,4-Dinitrotoluene	4/2/03	0.0350	J
TMW14A	Carbon disulfide	10/18/02	2.30	J
TMW14A	Aluminum	10/18/02	535	
TMW14A	Aluminum	4/2/03	5390	
TMW14A	Aluminum	4/2/03	6750	D
TMW14A	Antimony	4/2/03	0.622	DFJ
TMW14A	Antimony	4/2/03	0.926	DJ
TMW14A	Arsenic	10/18/02	2.65	FJ
TMW14A	Arsenic	4/2/03	1.38	DFJ
TMW14A	Arsenic	4/2/03	1.56	FJ
TMW14A	Arsenic	10/18/02	2.95	J
TMW14A	Arsenic	4/2/03	1.31	J
TMW14A	Arsenic	4/2/03	1.44	DJ
TMW14A	Barium	10/18/02	18.1	FJ
TMW14A	Barium	4/2/03	22.1	DFJ
TMW14A	Barium	4/2/03	66.8	FJ
TMW14A	Barium	10/18/02	30.7	
TMW14A	Barium	4/2/03	108	J
TMW14A	Barium	4/2/03	139	DJ
TMW14A	Beryllium	4/2/03	0.329	J
TMW14A	Calcium	10/18/02	3010	F
TMW14A	Calcium	4/2/03	5360	FJ
TMW14A	Calcium	4/2/03	7870	DFJ
TMW14A	Calcium	10/18/02	3510	
TMW14A	Calcium	4/2/03	7190	J
TMW14A	Calcium	4/2/03	10300	DJ
TMW14A	Cobalt	4/2/03	0.185	DFJ
TMW14A	Cobalt	4/2/03	0.728	FJ
TMW14A	Cobalt	10/18/02	0.214	J
TMW14A	Cobalt	4/2/03	0.985	J
TMW14A	Cobalt	4/2/03	1.37	DJ
TMW14A	Copper	4/2/03	4.68	DJ
TMW14A	Iron	10/18/02	343	
TMW14A	Iron	4/2/03	2230	
TMW14A	Iron	4/2/03	2820	D
TMW14A	Lead	4/2/03	1.46	FJ

Table 14
Detected Parameters
Second Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW14A	Lead	4/2/03	2.00	
TMW14A	Lead	4/2/03	2.98	D
TMW14A	Magnesium	10/18/02	449	F
TMW14A	Magnesium	4/2/03	445	DFJ
TMW14A	Magnesium	4/2/03	1630	FJ
TMW14A	Magnesium	10/18/02	605	
TMW14A	Magnesium	4/2/03	2300	
TMW14A	Magnesium	4/2/03	2760	D
TMW14A	Manganese	10/18/02	37.4	F
TMW14A	Manganese	4/2/03	68.7	FJ
TMW14A	Manganese	4/2/03	99.7	DFJ
TMW14A	Manganese	10/18/02	47.5	
TMW14A	Manganese	4/2/03	106	J
TMW14A	Manganese	4/2/03	167	DJ
TMW14A	Potassium	10/18/02	951	FJ
TMW14A	Potassium	4/2/03	1030	FJ
TMW14A	Potassium	10/18/02	621	J
TMW14A	Potassium	4/2/03	1110	DJ
TMW14A	Potassium	4/2/03	1130	J
TMW14A	Selenium	10/18/02	0.501	FJ
TMW14A	Selenium	4/2/03	0.656	FJ
TMW14A	Selenium	4/2/03	0.725	DFJ
TMW14A	Selenium	10/18/02	1.07	J
TMW14A	Selenium	4/2/03	0.535	J
TMW14A	Selenium	4/2/03	0.685	DJ
TMW14A	Sodium	10/18/02	404000	F
TMW14A	Sodium	4/2/03	404000	F
TMW14A	Sodium	4/2/03	405000	DF
TMW14A	Sodium	10/18/02	414000	
TMW14A	Sodium	4/2/03	400000	
TMW14A	Sodium	4/2/03	405000	D
TMW14A	Vanadium	4/2/03	6.71	DFJ
TMW14A	Vanadium	4/2/03	11.1	FJ
TMW14A	Vanadium	10/18/02	0.527	FJ
TMW14A	Vanadium	4/2/03	13.9	J
TMW14A	Vanadium	4/2/03	14.0	DJ
TMW14A	Vanadium	10/18/02	1.11	J
TMW14A	Zinc	4/2/03	5.82	FJ
TMW14A	Zinc	4/2/03	6.43	DFJ
TMW14A	Zinc	4/2/03	18.6	DJ
TMW14A	Zinc	4/2/03	19.9	J

Table 14
Detected Parameters
Second Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value (ug/l)	Flag Code
TMW16	Carbon disulfide	4/4/03	1.20	J
TMW17	Carbon disulfide	4/4/03	0.300	J

Notes:
ug/l - micrograms per liter

Flag Codes
J - Value is estimated
F - Sample filtered prior to analysis
D - Duplicate analysis

Table 15
Ground Water Field Parameters
Second Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW05	Conductivity - field	10/15/02	2314	UMHC	
TMW05	Conductivity - field	3/31/03	2233	UMHC	
TMW05	Dissolved Oxygen - field	10/15/02	8.58	MGL	
TMW05	Dissolved Oxygen - field	3/31/03	7.94	MGL	
TMW05	pH - field	10/15/02	7.80	PH UNITS	
TMW05	pH - field	3/31/03	7.57	PH UNITS	
TMW05	Redox Potential - field	10/15/02	199	MV	
TMW05	Redox Potential - field	3/31/03	342.7	MV	
TMW05	Temperature - field	10/15/02	12.71	C	
TMW05	Temperature - field	3/31/03	12.21	C	
TMW05	Turbidity - field	10/15/02	40.0	NTU	
TMW05	Turbidity - field	3/31/03	25.3	NTU	
TMW14A	Conductivity - field	10/18/02	1871	UMHC	
TMW14A	Conductivity - field	4/2/03	1875	UMHC	
TMW14A	Dissolved Oxygen - field	10/18/02	4.19	MGL	
TMW14A	Dissolved Oxygen - field	4/2/03	3.72	MGL	
TMW14A	pH - field	10/18/02	8.55	PH UNITS	
TMW14A	pH - field	4/2/03	8.72	PH UNITS	
TMW14A	Redox Potential - field	10/18/02	180.7	MV	
TMW14A	Redox Potential - field	4/2/03	12.1	MV	
TMW14A	Temperature - field	10/18/02	9.35	C	
TMW14A	Temperature - field	4/2/03	13.57	C	
TMW14A	Turbidity - field	10/18/02	6.99	NTU	
TMW14A	Turbidity - field	4/2/03	999	NTU	J
TMW16	Conductivity - field	10/12/02	1766	UMHC	
TMW16	Conductivity - field	4/4/03	1819	UMHC	
TMW16	Dissolved Oxygen - field	10/12/02	3.08	MGL	
TMW16	Dissolved Oxygen - field	4/4/03	3.59	MGL	
TMW16	pH - field	10/12/02	8.24	PH UNITS	
TMW16	pH - field	4/4/03	8.38	PH UNITS	
TMW16	Redox Potential - field	10/12/02	223.7	MV	
TMW16	Redox Potential - field	4/4/03	221.2	MV	
TMW16	Temperature - field	10/12/02	10.55	C	
TMW16	Temperature - field	4/4/03	17.85	C	
TMW16	Turbidity - field	10/12/02	3.10	NTU	
TMW16	Turbidity - field	4/4/03	294	NTU	
TMW17	Conductivity - field	10/12/02	1777	UMHC	
TMW17	Conductivity - field	4/4/03	1930	UMHC	
TMW17	Dissolved Oxygen - field	10/12/02	1.58	MGL	
TMW17	Dissolved Oxygen - field	4/4/03	5.93	MGL	
TMW17	pH - field	10/12/02	10.68	PH UNITS	
TMW17	pH - field	4/4/03	9.65	PH UNITS	
TMW17	Redox Potential - field	10/12/02	181.7	MV	

Table 15
Ground Water Field Parameters
Second Sandstone Water-Bearing Zone
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Site ID	Parameter	Collection Date	Value	Units	Flag Codes
TMW17	Redox Potential - field	4/4/03	42.1	MV	
TMW17	Temperature - field	10/12/02	17.91	C	
TMW17	Temperature - field	4/4/03	14.88	C	
TMW17	Turbidity - field	10/12/02	36.0	NTU	
TMW17	Turbidity - field	4/4/03	770	NTU	
TMW18	Conductivity - field	10/19/02	10547	UMHC	
TMW18	Conductivity - field	4/4/03	3879	UMHC	
TMW18	Dissolved Oxygen - field	10/19/02	7.74	MGL	
TMW18	Dissolved Oxygen - field	4/4/03	4.37	MGL	
TMW18	pH - field	10/19/02	15.96	PH UNITS	
TMW18	pH - field	4/4/03	12.1	PH UNITS	
TMW18	Redox Potential - field	10/19/02	17.2	MV	
TMW18	Redox Potential - field	4/4/03	-167.6	MV	
TMW18	Temperature - field	10/19/02	10.11	C	
TMW18	Temperature - field	4/4/03	16.04	C	
TMW18	Turbidity - field	10/19/02	1.60	NTU	
TMW18	Turbidity - field	4/4/03	16.0	NTU	
TMW19	Conductivity - field	10/19/02	4064	UMHC	
TMW19	Conductivity - field	4/4/03	2928	UMHC	
TMW19	Dissolved Oxygen - field	10/19/02	7.19	MGL	
TMW19	Dissolved Oxygen - field	4/4/03	1.53	MGL	
TMW19	pH - field	10/19/02	8.21	PH UNITS	
TMW19	pH - field	4/4/03	8.32	PH UNITS	
TMW19	Redox Potential - field	10/19/02	-81.6	MV	
TMW19	Redox Potential - field	4/4/03	199.3	MV	
TMW19	Temperature - field	10/19/02	16.37	C	
TMW19	Temperature - field	4/4/03	19.2	C	
TMW19	Turbidity - field	10/19/02	6.20	NTU	
TMW19	Turbidity - field	4/4/03	999	NTU	J

Notes:

UMHC - micromhos per centimeter
MGL - milligrams per liter
PH UNITS - standard pH units
MV - millivolts
C - degrees celcius
NTU - Nephelometric Turbidity Units

Flag Codes

J - Estimated Concentration

Table 16
Detected Parameters
Soil Investigation-Derived Waste
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Sample Id	Collection Date	Parameter	Result (mg/l)	Flag Code	RCRA TCLP Maximum Concentration (mg/l)	Result Exceeds RCRA TCLP Maximum Concentration?
ROC01	8/12/02	1,4-Dichlorobenzene	0.0025	J	7.5	No
ROC01	8/12/02	Barium	0.922		100.0	No
ROC01	8/12/02	Hexachlorobutadiene	0.0037	J	0.5	No
ROC02	8/20/02	Barium	0.809		100.0	No

Notes:

mg/l - milligrams per liter

RCRA TCLP Maximum Concentration - Maximum Concentration of Contaminants for the Resource Conservation and Recovery Act Toxicity Characteristic, 40 CFR 261.30(b), Table 1.

Results reported to RCRA TCLP screening values, not Minimum Detection Limits (MDLs)

Flag Codes:

J- value is estimated

Table 17
Detected Parameters
Liquid Investigation-Derived Waste
Administration and TNT Leaching Beds Areas
Fort Wingate Depot Activity
Gallup, New Mexico

Sample Id	Collection Date	Parameter	Result (mg/l)	Flag Codes	RCRA TCLP Maximum Concentration (mg/l)	Result Exceeds RCRA TCLP Maximum Concentration?
TANK03	8/20/02	2,6-Dinitrotoluene	0.000493		NS	No
TANK03	8/20/02	2-Butanone	0.0046	J	NS	No
TANK03	8/20/02	4-Amino-2,6-dinitrotoluene	0.000368		NS	No
TANK03	8/20/02	Barium	0.0795		100.0	No
TANK03	8/20/02	Chromium	0.0069	J	5.0	No
TANK03	8/20/02	Nitrobenzene	0.000305		2.0	No
TANK04	8/20/02	2,6-Dinitrotoluene	0.000194	J	NS	No
TANK04	8/20/02	4-Amino-2,6-dinitrotoluene	0.000235	J	NS	No
TANK04	8/20/02	Barium	0.0478		100.0	No
TANK04	8/20/02	Chromium	0.0113		5.0	No
TANK04	8/20/02	Nitrobenzene	9.59E-05	J	2.0	No
TANK05	8/30/02	Barium	0.097		100.0	No
TANK06	8/30/02	2,4,6-Trinitrotoluene	0.000167	J	NS	No
TANK06	8/30/02	4-Nitrotoluene	0.000292	J	NS	No
TANK06	8/30/02	Barium	0.171		100.0	No
TANK06	8/30/02	Chromium	0.0292		5.0	No
TANK06	8/30/02	Nitrobenzene	0.000375		2.0	No
TANK06	8/30/02	RDX	0.000295		NS	No
TANK06	8/30/02	Tetrachloroethene	0.018		0.7	No

Notes:

ug/l - micrograms per liter

RCRA TCLP Maximum Concentration - Maximum Concentration of Contaminants for the Resource Conservation and Recovery Act Toxicity Characteristic, 40 CFR 261.30(b), Table 1.

Results reported to RCRA TCLP screening values, not Minimum Detection Limits (MDLs).

Flag Codes:

J- value is estimated