DRAFT FINAL

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2 (GROUNDWATER)
FORMER NEBRASKA ORDNANCE PLANT
MEAD, NEBRASKA
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Appendix A "Availability of Water in Eastern Saunders County, Nebraska" (Souders, 1967)

LIST OF ACRONYMS

AFBMD	Air Force Ballistic Missile Division
AMA	Atlas Missile Area
AOA	Area of Attainment
ARDC	Agriculture Research and Development Center
ASTM	American Standards for Testing and Materials
BAZE	Biologically Active Zone Enhancement
BFI	Base Flow Index
bgs	Below Ground Surface
CENWK	U.S. Army Corps of Engineers, Kansas City District
CEWP	Containment Evaluation Work Plan
cfs	Cubic Feet per Second
d	Day
DEM	Digital Elevation Model
ECC	Environmental Chemical Corporation
ET	Evapotranspiration
EW	Extraction Well
F	Fahrenheit
FNOP	Former Nebraska Ordnance Plant
fps	Feet per Second
ft	Feet
ft/day	Feet per Day
ft^2/day	Square Feet per Day
ft^3/day	Cubic Feet per Day
GCW	Groundwater Circulation Well
GIS	Geographic Information System
GMP	Groundwater Monitoring Plan
gpd	Gallons per Day
gpd/ft	Gallons per Day per Foot
gpm	Gallons per Minute
GWM05	2005 Groundwater Model
GWM06	2006 Groundwater Model
HMX	1,3,5,7-Tetranitrol-1,3,5,7-Tetrazine
ICE	Initial Containment Evaluation

LIST OF ACRONYMS

K	Hydraulic Conductivity
LGI	Layne Geosciences Inc.
LL	Load Line
LWS	Lincoln Water System
LPNNRD	Lower Platte North Natural Resource District
mg/l	Milligram per Liter
MGD	Million Gallons per Day
MOC	Method of Characteristic
MUD	Metropolitan Utilities District
NAD 27	North American Datum of 1927
NAD 83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NCP	National Contingency Plan
NDNR	Nebraska Department of Natural Resources
NED	National Elevation Dataset
NGVD 29	National Geodetic Vertical Datum of 1929
NRD	Natural Resource District
NRR	Nebraska Research Reservoir
OU2	Operable Unit 2
PET	Potential Evapotranspiration
ppb	Parts per Billion
psi	Pounds per Square Inch
PZ	Piezometer
RDGM IV	Remedial Design Groundwater Model, Version IV
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
ROD	Record of Decision
SW	Surface Water
TCE	Trichloroethene
TNT	2,4,6-Trinitrotoluene
TRC	Technical Review Committee
TVD	Higher Order Finite Volume Method
UNL	University of Nebraska - Lincoln

LIST OF ACRONYMS

USGS	United States Geological Survey
USACE	U.S. Army Corps of Engineers
URS	URS Group Inc.
UV	Ultraviolet Light
VOC	Volatile Organic Compound
µg/l	Microgram per Liter
1 YCE	1 Year Containment Evaluation

The subject of this document is the 2006 Groundwater Model (GWM06), which has been prepared as a part of Operable Unit 2 (OU2) activities at the former Nebraska Ordnance Plant (FNOP) site near Mead, Nebraska. **Figure 1-1** shows the general location of the site, and a detailed map of the site is presented on **Figure 1-2**. The modeling has been performed under Task Order No. 002 of the U.S. Army Corps of Engineers (USACE), Kansas City District (CENWK) Contract No. DACW41-03-D-0001.

This GWM06 model is an expansion and detailed refinement of the 2005 Groundwater Model (GWM05). The GWM06 extends further south to include the Lincoln Water System water supply wells near Ashland, and further east to include the east valley wall of the Platte and Elkhorn rivers. GWM05 was used in the Load Line 1 remedial design, and was a revised version of Remedial Design Groundwater Model IV (RDGM IV). During the acquisition of data to define the GWM06 model surfaces in the new areas, new data were incorporated into the existing portions of the model previously covered by GWM05. As in the previous model revisions, the conceptual model was re-evaluated based on the new information.

Major refinements in GWM06 include:

- The expansion and update of the bedrock and the base of the loess surfaces.
- Conversion of model coordinates from North American Datum (NAD) 1927 to NAD 1983.
- Extensive re-characterization of plumes based on direct-push data collected in Fall 2005 and Spring 2006; as well as data collected as part of the site-wide Groundwater Monitoring program (GMP).
- More detailed hydraulic conductivity distribution.
- Additional hydrologic parameter adjustments to improve the model capability to accurately simulate all available site data.

1.1 PURPOSE AND OBJECTIVE

This document describes the updated and refined conceptual model, data, assumptions, and numerical model calibrations. A short maintenance shutdown of the FNOP extraction wells in the fall of 2006 presented an opportunity to collect water level data under non-pumping conditions, and during the resumption of pumping. These data were used to complete transient calibration of the model, which is described in this report.

The purpose of the GWM06 is to support the Containment Evaluation. The model will be used to estimate the horizontal and vertical extent of capture zones in the alluvial aquifer for individual extraction wells and the extraction well system as a whole, using particle tracking and contaminant transport simulations. On a broader scale, the GWM06 will also serve as a tool to assess overall remedy performance.

1.2 SUMMARY OF PREVIOUS MODELS

The design of the OU2 containment system was accomplished by developing a site-specific groundwater model. The current model is the culmination of groundwater modeling that started with the Removal Action Groundwater Modeling (Woodward-Clyde, 1994). The groundwater modeling efforts to date have resulted in the following model versions and reports:

- Conceptual Groundwater Model (Woodward-Clyde, 1996a)
- Remedial Design Groundwater Model (RDGM) (Woodward-Clyde, 1998)
- Remedial Design Groundwater Model Part II (RDGM II) (Woodward-Clyde, 1999)
- Remedial Design Groundwater Model III (RDGM III) (URS, 2002a)
- Remedial Design Groundwater Model IV (RDGM IV) (URS, 2004b)
- GWM05 Updates to RDGM IV described in the Load Line 1 Remedial Design (URS, 2005)

To minimize redundancies, this work plan will refer to the above-mentioned documents when appropriate.

1.2.1 RDGM I, II, and III

The primary purposes of the RDGM I and II modeling activities were to provide a basis of design for the hydraulic containment system. The containment system was designed to contain the area of attainment boundary as defined in the Record of Decision (ROD) (Woodward-Clyde, 1996a). The area of attainment (AOA) is defined on Figure 3 of the 1997 OU2 ROD.

The total pumping rate for the initial RDGM I containment system design was 7,680 gallons per minute (gpm), 5,000 gpm of which was generated by focused extraction wells in higher concentration areas. The revisions incorporated in RDGM II were a response to public perception that the RDGM I design would create potential water supply problems by increasing drawdowns in private wells. The RDGM II design targeted an extraction flow rate less than 4,000 gpm by limiting the focused extraction wells to the Load Line 2 hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) plume and the Atlas Missile trichloroethene (TCE) plume, while keeping the total pumping rate of the hydraulic containment wells similar to the RDGM I design rate (2,330 gpm not including EW-11, 2,680 gpm with EW-11). The RDGM II design included alternatives for focused extraction wells (total pumping rate of 800 gpm), or the use of groundwater circulation wells (GCWs) instead of extraction wells in areas with higher concentrations.

RDGM III (URS, 2002a) had the same grid as RDGM II, however, the bedrock surface was modified using new pilot-hole data. The hydraulic conductivity distribution was modified using data from tests of the newly installed extraction wells. The higher than anticipated hydraulic conductivity estimates were partially offset by shallower than anticipated bedrock depths (particularly at EW-6, EW-7, EW-9, and EW-10), resulting in slightly higher transmissivity estimates and slightly higher design pumping rates (2,375 gpm not including EW-11, 2,725 gpm with EW-11). The initial total pumping rate at start-up was 2,610 gpm (not including EW-11).

1.2.2 RDGM IV

In 2003-2004, significant revisions incorporated in RDGM IV included:

- Expansion of the model domain to nearby physical boundaries of the aquifer (e.g., the Platte River, Silver Creek, and the loess-mantled till uplands).
- Refinement of the grid dimensions to place observation wells in cells separate from pumping wells.

- Re-characterization of initial concentrations near Load Line (LL) 1 using data collected by direct-push methods near Silver Creek in 2004.

The RDGM IV modeling simulated the first year and a half of pumping through October 2003, at which time the total pumping rate was 2,345 gpm.

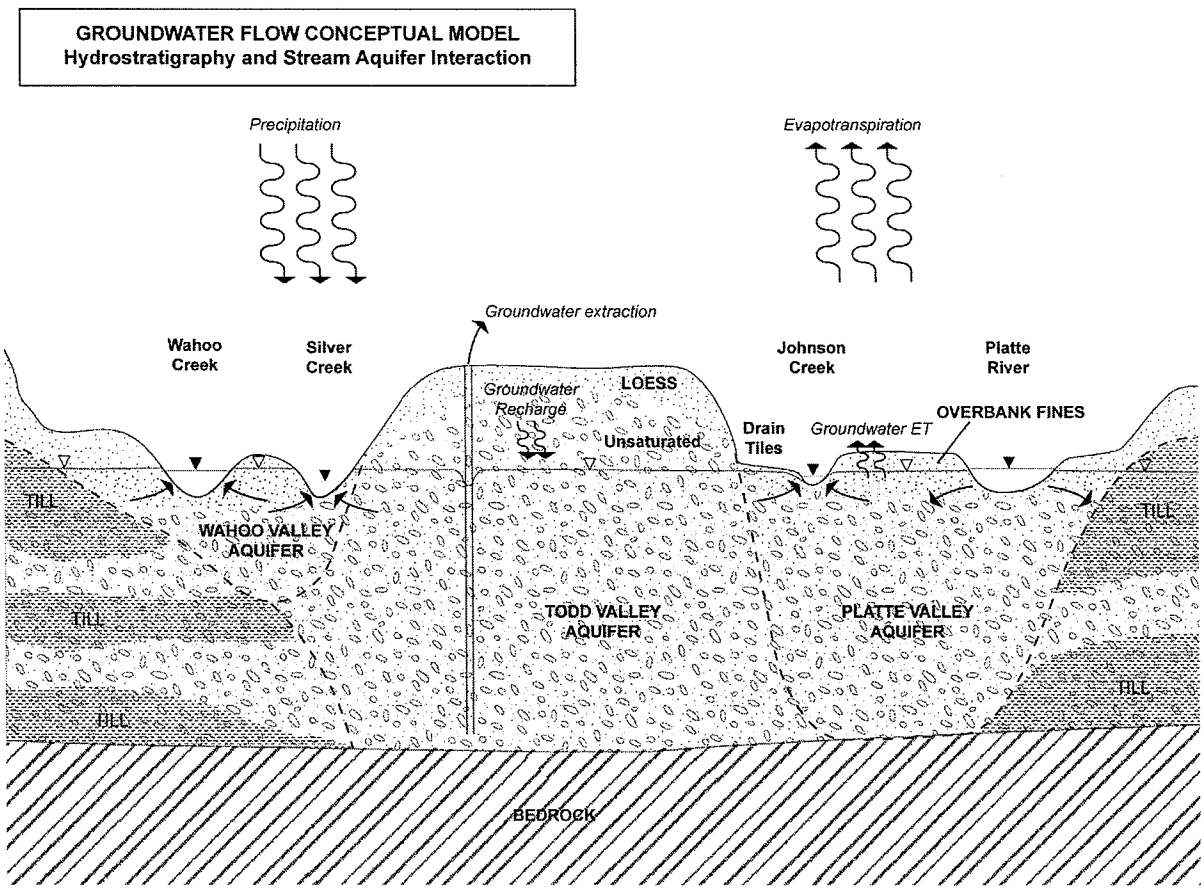
1.2.3 GWM05

The groundwater model was further updated in 2005 for the design of the LL1 treatment system including extraction wells EW-12 and EW-13. The Draft Final LL1 Containment System Remedial Design (URS, 2005) documents the changes to RDGM IV that resulted in GWM05 (a separate groundwater model report was not issued), and how the model was used during the design. GWM05 had the same grid and surfaces as RDGM IV but incorporated the following changes:

- Inclusion of Wahoo Creek by expanding the active part of the model from Silver Creek to the southwest edge of the Todd Valley (i.e., to the loess-mantled till uplands south of Wahoo Creek).
- Adjustment of drain cell elevations in the Platte River valley to generally within 1 to 5 feet (ft) of ground surface.
- Addition of registered irrigation and municipal supply wells. This includes use of Lincoln Water System wells in the history matching and future predictions, and the use of Omaha Metropolitan Utility District Platte West wells in future predictions.

The schematic below shows the major components of the groundwater/surface water conceptual model. The Todd Valley is an abandoned stream terrace of the ancestral Platte River bounded by till uplands to the northeast, the Wahoo Valley to the west and south, and the Platte Valley to the southeast. The Wahoo Valley is incised into the Todd Valley terrace. The Todd Valley aquifer is unconfined and has 20 to 40 ft of unsaturated alluvium beneath the overlying loess. The bedrock beneath the alluvium consists of poorly cemented sandstone interbedded with shale and siltstone. The vertical communication between the bedrock and the alluvium is limited due to the very small vertical gradient and the two-orders of magnitude difference in vertical hydraulic conductivities.

The Platte River is a losing stream in the model area, whereas the Elkhorn River and Clear, Johnson, Silver, and Wahoo creeks are gaining streams. The overbank fines in the Platte Valley and Wahoo Valley act as confining layers. The transition from unconfined conditions to confined conditions is evident along Johnson Creek. The portion of Johnson Creek that is in the Todd Valley is typically dry except during precipitation events. The portion of Johnson Creek in the Platte Valley, however, is typically flowing due to groundwater discharge from the confined Platte Valley aquifer. Agricultural drain tiles in the Platte Valley discharge to Johnson and Clear Creeks in areas where the potentiometric surface is near or above the ground surface. The shallow potentiometric surface in the Platte Valley results in significant evapotranspiration as seen in seasonal fluctuations of water levels in the Platte Valley that are not observed in the Todd Valley.



2.1 PHYSIOGRAPHY AND TOPOGRAPHY

The physiography of eastern Saunders County can be divided into three regions: flood plain, terrace plain, and uplands. **Figure 2-1** shows the site ground surface elevations, and includes an inset showing the three physiographic regions as defined by Souders (1967).

The flood plain primarily consists of the flood plains of the Platte River and Wahoo Creek. Elevations range from 1050 ft (North American Vertical Datum [NAVD] 88) near the Lincoln Water System (LWS) well field in the southeast, to 1130 ft near Ithaca in the Wahoo valley, and 1120 ft near Leshara in the Platte valley. The topography is flat, sloping 4 ft per mile in the Platte Valley and 6 ft per mile in Wahoo Valley.

The terrace plain is known as Todd Valley, and is a stream terrace abandoned when the ancestral Platte pirated a tributary of the Elkhorn River. The terrace is generally 50 ft higher in elevation than the Wahoo Creek and Platte River flood plains. Elevations range from 1220 ft near Colon in the northwest corner of the model area to 1100 ft in the southeast, with a slope of approximately 9 ft per mile.

There are two areas of till uplands in the model area. One area is between the Todd Valley and the Platte Valley, and the other is southwest of Wahoo Creek. In contrast to the relatively flat Todd Valley terrace plain, the uplands are hilly with elevations ranging between 50 and 200 ft higher than Todd Valley.

There appear to be differences between the Digital Elevation Model (DEM) on **Figure 1-2**, and the topographic Geographic Information System (GIS) layer as shown on **Figure 2-1**. The source of the topographic data on **Figure 2-1** is the 1/3-arc second (approximately 10-meter resolution) National Elevation Dataset (NED) dated May 2002. The 10-meter NED DEM is created from topographic contour lines drawn using overlapping stereo-pair aerial photos, corrected by the addition of breaklines. The contours are accurate, but elevations between the contours are interpolated and can be off by five ft or more. The DEM specification only requires a minimum of 28 ground control points within each United States Geological Survey (USGS) topographic quadrangle, an area of over 50 square miles. The GIS topography layer shown in the detailed site map on **Figure 1-2** is derived from USGS topographic quadrangles. The Mead Digital Raster Graphic quadrangle was last updated in 1997.

The elevation of the area around stream gauge CC-1 on Clear Creek is between 1070 and 1080 ft AMSL on **Figure 2-1**, but greater than 1080 ft on **Figure 1-2**. The measurement datum for M94-6, a piezometer located in the area, is 1085.5 ft, and the March 2006 groundwater level was 1083.68 ft. A spot elevation on County Road H on the USGS topographic quadrangle near M94-6 is 1088 ft. Additional field confirmation of ground surface elevation is provided by the temporary piezometer arrays installed for the Groundwater Flow Net Analysis (Woodward-Clyde, 1993a). These were located between Johnson Creek and Clear Creek approximately one-half mile south of M94-6, and had ground surface elevations of approximately 1082 ft, which correspond to the USGS quadrangle elevations, but are higher than the DEM elevations of approximately 1074 ft to 1077 ft. PZ-05, located at the southeast edge of the area in question, has a surveyed ground surface elevation of 1084.19 ft compared to the NED elevation at that location of 1079.17 ft.

A comparison of surveyed ground surface elevations at 292 monitoring wells, observation wells, and extraction wells showed that the NED elevations were an average of 0.2 ft higher than the surveyed elevations. Out of the 292 locations, the NED elevations were more than 5 ft higher at 21 locations (7.2 percent), and more than 5 ft lower at 21 locations. The locations of greatest difference are near areas of higher relief, as shown on **Figure 2-1**. These locations include EW-1, EW-8, and GCW-2, which are all located next to drainages.

2.2 GEOLOGY

2.2.1 Bedrock

The Cretaceous Omadi Formation, approximately equivalent to and often called the Dakota Formation, underlies all but the southeastern portion of Saunders County (Souders, 1967). The formation consists of sandstone, siltstone, and shale. About half the unit is poorly cemented sandstone. In general, the uppermost unit in the Omadi is shale in the northwestern portion of the former FNOP, and sandstone in the southeastern portion. Cores of the upper portion of bedrock, however, often contain interbedded sandstone and shale.

In southeastern Saunders County, including the area of the LWS Ashland well field, the uppermost bedrock consists of Pennsylvanian limestones and shales.

Figure 2-2 shows the interpreted bedrock surface. The surface was developed using data presented in **Table 2-1** from the following sources:

- Nebraska Department of Natural Recourses (NDNR) registered well database (through June 2006)
- Souders (1967)
- Piskin (1971)
- USACE boring logs
- "Configuration of the Base of the Principal Aquifer, 1979" (CSD, 1996a)

The boring log data in the NDNR registered well database are of uneven quality. Many of the logs are drillers' logs based on cuttings rather than discrete samples. The bedrock contour was generated by compiling data from the posted sources, and outliers were removed by comparing the elevations to each other and a digitized contour of the statewide "Configuration of the Base of the Principal Aquifer, 1979" (CSD, 1996a). Where nearby data points conflicted, preference was given to data from borings sampled with discrete samplers such as the monitoring well borings, extraction well pilot holes, and municipal well field test holes. Among borings sampled from cuttings, preference was given to the USGS (Souders, 1967) and Piskin (1971) over irrigation well logs.

2.2.2 Till and Fluvio-glacial Deposits

Souders (1967) used the configuration of the bedrock surface and data on the ease or difficulty in obtaining water supplies to infer the presence of buried Quaternary channels beneath the till uplands. These sand and gravel channels might possibly correlate to the David City Formation of Nebraskan age, which is a pro-glacial fluvial deposit. The David City Formation is overlain by Nebraskan and Kansan tills, which are composed of a heterogeneous mixture of clay and silt

(Reed and Dreeszen, 1965). Souders indicates some sands, silts, and clays in between layers of till, which may correspond to younger fluvio-glacial deposits, possibly of Kansan age.

The ancestral Platte River eroded most of the till, and fluvio-glacial deposits in Todd Valley were mostly eroded before late Kansan time. Clays, silts, and sands near the margins of Todd Valley, such as those near the landfill in the northeastern portion of the FNOP, may be remnant Early or Medial-Pleistocene fluvio-glacial deposits.

2.2.3 Todd Valley Deposits

During the middle and late Pleistocene, Todd Valley was filled by coarse alluviation ahead of advancing ice. Deposition was interrupted by erosion during inter-glacial stages. The deposits in Todd Valley might include the Kansan-age sands and gravels of the Grand Island Member, and the Illinoian-age Crete Member, which may be re-worked sediments of the Grand Island Member. Intense erosion preceded the deposition of the finer grained Todd Valley Sand during retreat of the Wisconsinan ice sheet (Reed, 1948).

The unconsolidated sediments in the Todd Valley range from 81 ft near the landfill to 157 ft in the paleochannel near EW-8 (Woodward-Clyde, 1993b).

Due to the difficulty in differentiating the ages of the alluvium in the Todd Valley, Piskin (1971) attempted to divide the alluvium into two informal units. Piskin chose the top of the lower unit based on the uppermost occurrence of a trace of medium gravel (on the Wentworth scale, roughly equivalent to fine gravel on the American Standards for Testing and Materials (ASTM) scale) or 20 percent fine gravel (on the Wentworth scale, roughly equivalent to coarse sand on the ASTM scale). As more stratigraphic data was collected during the Remedial Investigation (RI) (Woodward-Clyde, 1993b), the greater complexity of the Todd Valley sediments became evident, and the gradual transition in grain size between the upper and lower alluvium made Piskin's classification impractical. For modeling purposes, the Todd Valley aquifer is divided into two layers to correspond to the depths of the shallow and intermediate monitoring wells, allowing vertical distribution of concentration data.

2.2.4 Loess

During Wisconsinan time Todd Valley and the surrounding uplands were covered by the light brown and light-gray mottled Peoria Loess. The loess typically ranges between 10 and 20 ft in thickness in Todd Valley. The loess is absent in the Platte River valley and Wahoo Creek valley. **Figure 2-3** presents the interpreted base of the loess.

2.2.5 Wahoo Valley Alluvium

A cross-section presented by Souders (1967) indicates that the sediments in the Wahoo Valley are stratigraphically distinct from the Todd Valley sediments, and were deposited by Wahoo Creek. The similarity of elevation of the Wahoo and Platte valleys suggests that the Wahoo Valley may lie in the abandoned channel of the ancestral Platte River.

The sediments in Wahoo Valley are generally 30 to 80 ft thick. The upper silts and clays in Wahoo Valley are alluvial overbank fines and are unrelated to the Peoria Loess. They are typically less than 15 ft thick. In the vicinity of EW-12, Wahoo Valley alluvium tends to be finer with less gravel than the alluvium in the Todd Valley. Souders (1967) indicates that glacio-

fluvial silts correlative with Early Pleistocene units in the till uplands southwest of Wahoo Creek may be present at the base of unconsolidated sediments in the Wahoo Valley.

2.2.6 Platte River Alluvial Gravels, Sands and Fines

Most of the sands and gravels of the Platte River alluvium are probably Wisconsinan or Recent and not correlative to the Todd Valley sediments. However, remnants of older sediments may be present in the Platte Valley. The Platte River alluvium is typically less than 50 ft thick in the western and eastern portions of the valley, including the area near Johnson Creek and EW-1, but a channel in the bedrock surface up to 100 ft deep is oriented north-south through the center of the valley and the Metropolitan Utilities District (MUD) well field.

The silts and clays overlying the Platte River sands and gravels are alluvial overbank deposits, which are unrelated to the Peoria Loess. The thickness of the overbank fines typically ranges from 0 to 20 ft.

2.3 HYDROSTRATIGRAPHY

The hydrogeology of the modeled area consists of three major alluvial aquifers: the Todd Valley aquifer, the Platte Valley aquifer, and the Wahoo Valley aquifer; and one minor aquifer, the Uplands aquifer. All four aquifers are underlain by the Omadi Formation, except where the Omadi is absent and the subcrop consists of Pennsylvanian strata near the LWS Ashland well field. For modeling purposes, it was assumed that there is a sufficient vertical permeability contrast between the Omadi Formation and the unconsolidated alluvial aquifers so that the Omadi Formation forms an impermeable base to the alluvial aquifer system. This assumption was made for the following reasons:

- Flow in the aquifer as measured at the Site is near horizontal with little to no vertical gradients measured in the wells screened in the unconsolidated aquifer (**Table 2-3**).
- A two-order of magnitude difference in the vertical hydraulic conductivity exists between the unconsolidated aquifers and the Omadi Formation. Generally, a two-order of magnitude difference in hydraulic conductivity is sufficient to justify the placement of an impermeable boundary (Anderson and Woessner, 1992).

2.3.1 Platte Valley Aquifer

The hydrostratigraphy of the Platte Valley consists of two principal layers:

1. Silt and clay overbank deposits approximately 5 to 15 ft thick
2. Coarse grained sand and gravel alluvium

The low permeability overbank deposits act as an upper semi-confining unit to the Platte Valley aquifer, which impedes but does not prevent upflow between the aquifer and the ground surface (Woodward-Clyde, 1996a).

2.3.2 Todd Valley Aquifer

The hydrostratigraphy of the Todd Valley consists of two principal sedimentary units:

1. The Peoria Loess, which is typically 10 to 20 ft thick but ranges from 2 to 23 ft thick at the Site (Woodward-Clyde, 1996a), and is unsaturated.
2. The Todd Valley sands and gravels, which are partially saturated, are typically between 80 and 110 ft thick, but can be as thick as 157 ft (near LL1), and as thin as 48 ft (southwest of the Landfill).

The Todd Valley aquifer is unconfined in nearly all of the model area; however, it may be confined in the northwest corner of the model. The saturated thickness of the aquifer is controlled by the erosional bedrock surface at its base and the elevation of the potentiometric surface, except where it is confined, and the loess forms the upper confining unit. Throughout the modeled area the saturated thickness of the aquifer ranges from approximately 30 ft in the southeast to over 100 ft near LL1 and near Mead.

2.3.3 Wahoo Valley Aquifer

The hydrostratigraphy of the Wahoo Valley consists of two principal sedimentary units:

1. Silt and clay overbank deposits typically 2 to 15 ft thick
2. Sand and gravel alluvium, typically 30 to 80 ft thick

Where present, the low permeability overbank deposits act as an aquitard to the Wahoo Valley aquifer that impedes but does not prevent upward flow.

2.3.4 Uplands Aquifer

The transmissivities in the till uplands (CSD, 2005) are generally lower than those in the Todd Valley, despite the greater saturated thickness (CSD, 1996c). Souders (1967) used the configuration of the bedrock surface and data on the ease or difficulty in obtaining water supplies to infer the presence of buried Quaternary channels beneath the till uplands. Clays, silts, and sands near the margins of Todd Valley, such as those near the landfill in the northeastern portion of the FNOP, may be remnant Early or Medial-Pleistocene fluvio-glacial deposits.

Souders (1967) infers a southeast trending channel along the Todd Valley side of the till uplands, but this is based on very little data. The bedrock surface contour (**Figure 2-2**) shows a buried channel trending east-west under the southern end of the till uplands, east of the Atlas Missile Area (AMA) and terminating under the stream terrace between Johnson Creek and Clear Creek that is an extension of the Todd Valley surface. According to "Transmissivity of the Principal Aquifer, 2005" (CSD, 2005) (**Figure 2-6**), however, the sediments composing this terrace have a lower transmissivity than the surrounding material, despite the greater thickness.

Souders (1967) inferred an area of low transmissivity near the village of Yutan based on specific capacities of Yutan's two municipal wells. The Yutan wells present in 1967 are no longer registered, and the three Yutan wells currently registered have higher specific capacities (based on registration information) than the original wells, suggesting that Souders' tentative mapping of an area without fluvio-glacial deposits beneath the till near Yutan may not be correct.

2.4 SURFACE WATER

The location of USGS, MUD, and USACE surface water gauges and measurement locations are shown on **Figure 1-2**. The March 2005 and March 2006 surface water measurements are presented in **Table 2-2**. The March 2006 surface water levels are also posted on **Figure 2-4**.

2.4.1 Platte River

The gradient of the Platte ranges from approximately 5 ft per mile between Leshara and Venice, and 3 ft per mile between Venice and Ashland. Flow in the Platte was summarized in the MUD Phase II Platte West Well Field/Groundwater Modeling Study (CAI, 2005), and is presented below:

USGS Gauge Location	Exceedance Frequency (percent)	Flow (cfs)	Flow (MGD)	Stage (ft NAVD 88)
Leshara Period of Record = 1993 to 2005	99	638	412	1,147.38
	90	1,730	1,120	1,147.88
	50	4,640	3,000	1,148.68
Ashland Period of Record = 1928 to 1960, and 1988 to 2005	99	642	415	1,054.28
	90	1,620	1,050	1,055.38
	50	4,260	2,750	1,056.38

The lowest weekly average flow over the last 10 years (7Q10) was calculated for the Platte at Leshara and Ashland, and the Elkhorn at Waterloo. The 7Q10 can be considered to be a low estimate for baseflow, and generally reflective of the flow without significant surface runoff. The average flow over the period was also calculated.

	Platte at Leshara (cfs)	Elkhorn at Waterloo (cfs)	Platte at Ashland (cfs)	Ashland - (Leshara + Waterloo) (cfs)
Average (Sept 1996-Sept 2006)	4,480	1,710	5,990	-200
7Q10	363	294	609	-48

The Elkhorn River enters the Platte between Leshara and Ashland. The difference between the flow of the Platte at Ashland and the combined flow of the Platte at Leshara and the flow of the Elkhorn at Waterloo is an indication of the net groundwater/surface water flux above Ashland. The table above suggests that under very low flow (7Q10) conditions, at least 48 cubic ft per seconds (cfs) (equivalent to 21,500 gpm) is lost to the aquifer and evapotranspiration from the Platte and the Elkhorn above Ashland. This is a minimum because the additional surface water contributions of the minor tributaries in this reach (e.g., Otoe Creek and Upper Clear Creek) must also be taken into account. Some of the loss to the aquifer could be from induced recharge from the LWS Ashland field, because the Ashland gauge is located near the well field. However, the gauge is located upstream of the main collector wells.

The flow in the Platte River exceeds 8 times the maximum average annual pumping rate for which the MUD Platte West field is permitted (approximately 52 MGD) 99 percent of the time.

As the exceedance table shows, the difference in flow at the 99% exceedance frequency level and the 90% exceedance frequency at Leshara is 1,100 cfs. The difference in stage, however, is only 0.5 ft. Given that the pumping rate of the Platte West field is one-eighth the flow at the 99% exceedance frequency level, it is reasonable to assume for the purposes of modeling that the pumping from the Platte West field will have a negligible effect on river stage. Therefore, it is reasonable to simulate the Platte River using river cells, in which the head in the river cells is constant and is insensitive to pumping from the Platte West field.

On the date of the site-wide water level measurements, March 29, 2006, the flow in the Platte at Leshara was 4,500 cfs, and the flow at Ashland was 6,170 cfs (USGS, 2006b). The flow in the Elkhorn at Waterloo was 1,500 cfs, which closely approximates the difference in flow in the Platte between Leshara and Ashland.

The piezometric surface interpreted by Souders (1967) also indicates that the Platte River is a losing stream between Yutan and Ashland. The gradient of the Platte, as depicted in Souders (1967), is detailed in the following table:

River Miles	Platte Elev. (ft NGVD 29)	Gradient (ft/ft)	Gradient (ft/mi)	Location
0	1134	_	_	4 miles downriver of Leshara
4.4	1114	0.0009	4.5	Near Yutan
6.0	1108	0.0007	3.8	Near mouth of Upper Clear Creek
8.8	1089	0.0013	6.8	1.2 miles downriver of Venice gauge
11.0	1085	0.0003	1.8	Near County Road G
14.4	1071	0.0008	4.1	1.2 miles downriver of mouth of Elkhorn
15.6	1066	0.0008	4.2	North of LWS well field

The gradient is steeper between Upper Clear Creek and the Venice gauge, and is followed by a flatter gradient above the confluence with the Elkhorn.

On March 29, 2006 the gradient of the Platte River was 5 ft per mile between Leshara and Venice, and 4 ft per mile between Venice and Ashland (USGS, 2006b). The gradients were approximately the same on March 29, 2005 at a similar discharge (4,080 cfs at Leshara and 6,360 cfs at Ashland).

2.4.2 Elkhorn River

The Elkhorn River is a major tributary to the lower Platte River. Flow in the Elkhorn River was summarized in the MUD Phase II Platte West Well Field/Groundwater Modeling Study (CAI, 2005), and is presented below:

USGS Gauge Location	Exceedance Frequency (percent)	Flow (cfs)	Flow (MGD)	Stage (ft NAVD 88)
Waterloo Period of Record = 1928 to 2004	99	150	97	1,106.68
	90	304	196	1,107.58
	50	740	478	1,108.98

The Waterloo Gauge is located in an entrenched portion of the Elkhorn River that has a flatter gradient than the Platte. On March 29, 2005 the gradient of the Elkhorn River was 2 ft per mile between Waterloo and the Platte River. Without another gauge on the Elkhorn downstream of Waterloo, it is difficult to determine if the Elkhorn River is a losing or gaining stream in the reach below Waterloo, although the interpreted potentiometric contours suggest that it might be a gaining stream.

2.4.3 Clear Creek

Clear Creek once flowed through Yutan in the till uplands all the way to Wahoo Creek. After flowing from the till uplands into the Platte Valley, Clear Creek flows within half a mile of the Platte River. At this point, a diversion channel has been cut to divert the flow into the Platte River, dividing Clear Creek into "Upper Clear Creek" and "Lower Clear Creek". In this report, "Clear Creek" is used interchangeably with "Lower Clear Creek".

The gradient of Clear Creek is steeper (approximately 7 ft/mile) between the origin of Lower Clear Creek near the Platte River and the section of Clear Creek above Johnson Creek (approximately 3 ft/mile). This may be due to the influence of groundwater recharge from the Platte River discharging to Clear Creek.

Flows measured at four locations along Clear Creek by the USGS between July 1990 and October 1992 (Woodward-Clyde, 1993a) are presented below:

Location	7/18/90 (cfs)	9/20/90 (cfs)	8/27/91 (cfs)	10/28/92 (cfs)
North side of Section 13, T14N, R9E	2.6	2.4	1.9	3.1
North side of Section 26, T14N, R9E	3.4	2.8	2.0	4.9
Immediately above Johnson Creek Confluence	3.0	1.9	3.0	6.1
1.2 Miles below Johnson Creek Confluence	6.7	6.3	6.2	10.8

The flows for August 27, 1991 are likely the closest to base flow rates, since they were measured near the end of irrigation season when groundwater levels are lowest, monthly precipitation in August 1991 was 1.51 inches below normal, and because there was no appreciable rainfall in the ten days prior to the measurements.

In 2002, the FNOP treatment plant began discharging treated groundwater to Clear Creek downstream of the Johnson Creek confluence. Part of the treated groundwater is also discharged to Wahoo Creek. The amount discharged to Clear Creek averaged 1.5 cfs in March 2006.

A tributary that drains the FNOP flows past the FNOP water treatment plant, and enters a farm pond near the Platte Valley wall, was measured below the pond three times by the USGS in 1990-1992, and the flow was 0.05 cfs or less.

2.4.4 Johnson Creek

Johnson Creek originates in the till uplands north of Mead, flows through the Todd Valley and into the Natural Resource District (NRD) Reservoir near the Landfill. Souders' (1967) interpretation of the potentiometric surface is unaffected by the upper portion of Johnson Creek in Todd Valley. Johnson Creek is usually dry between the NRD reservoir and the Platte Valley. The USGS measured flow at the outlet of the NRD reservoir 29 times between March 1990 and

October 1992, and flow was zero on all but one occasion. At the point at which Johnson Creek enters the Platte Valley, the highest flow was less than 0.05 cfs during the five occasions the USGS measured flow.

Souders (1967) indicates that Johnson Creek is a gaining stream in the Platte Valley. Upstream of the confluence with Clear Creek, Johnson Creek flows through an area of silty clay loam that is drained by agricultural tiles.

The gradient of Johnson Creek in the Platte Valley is steeper than the gradients of other streams in the model area. Upstream of the Memphis gauge, gradients are greater than 10 ft/mile. The gradients of other streams in the Platte Valley and the Wahoo Creek Valley range from 2 to 8 ft/mile.

Creek cross-sections and flows were measured on April 21, 2006 along Johnson Creek in the approximate areas of surface water (SW) sampling locations SW-6, SW-8, and SW-10 (URS, 2006).

Surface Water Location	Location Description	Depth (ft)	Width (ft)	Flow (cfs)
SW-6	~0.6 mile upstream of SW-8	0.1	1.2	trace
SW-8	Near MW-45 and USGS Gauge	0.7	7.1	0.9
SW-10	Near MW-36	0.6	4.0	1.0

The USGS gauge designated "Memphis" (despite being 4 miles from Memphis) was installed in Johnson Creek in August 1990. Flows measured at the Memphis gauge on the same dates as the USGS manual flow measurements in Clear Creek from July 1990 to October 1992 (Woodward-Clyde, 1993a) are presented below:

Location	7/18/90 (cfs)	9/20/90 (cfs)	8/27/91 (cfs)	10/28/92 (cfs)
Memphis Gauge, southeast corner of Section 26, T14N, R9E	NM	1.2	0.75	1.1

On April 21, 2006, the date of the manual flow measurements by URS, the mean flow measured by the gauge ranged from 1.0 to 1.1 cfs. Flow at the Johnson Creek Memphis gauge was summarized in the MUD Phase II Platte West Well Field/Groundwater Modeling Study (CAI, 2005), and is presented below:

USGS Gauge Location	Exceedance Frequency (percent)	Flow (cfs)	Flow (MGD)	Stage (ft NAVD 88)
Johnson Creek – Memphis Period of Record = 1990 to 2005	99	0.6	0.4	1,073.48
	90	0.9	0.6	1,073.58
	50	1.7	1.1	1,074.08

2.4.5 Wahoo Creek

Wahoo Creek originates in western Saunders County and flows out of the till uplands near the town of Wahoo. The Wahoo Creek valley below Wahoo is closer in elevation to the Platte Valley than it is to Todd Valley. Souders' (1967) interpreted potentiometric surface suggests that Wahoo Creek is a gaining stream.

Two USGS gauges are on Wahoo Creek, and the flow statistics cited in the MUD modeling report (CAI, 2005) are presented below:

USGS Gauge Location	Exceedance Frequency (percent)	Flow (cfs)	Flow (MGD)	Stage (ft NAVD 88)
Wahoo Creek - Ithaca Period of Record = 1993 to 2005	99	9.4	5.9	1,114.47
	90	18	11	1,114.58
	50	35	22	1,115.48
Wahoo Creek - Ashland Period of Record = 1928 to 1960, and 1988 to 2005	99	24	15	1,053.18
	90	36	23	1,053.58
	50	65	41	1,054.68

Downstream of Ithaca, the combined effluent of the main treatment plant and the LL1 treatment plant discharged an average of 3.0 cfs to Wahoo Creek in March 2006. Approximately 0.7 cfs (325 gpm) of that amount is from the LL1 treatment plant. The Wahoo Creek Ashland gauge is located downstream of the Silver Creek and Clear Creek confluence, and upstream of the City of Ashland wastewater treatment plant.

2.4.6 Silver Creek

Silver Creek begins in the Todd Valley near Cedar Bluffs, and flows south approximately 14 miles where it enters the Wahoo Creek Valley near Ithaca. Souders (1967) shows that Silver Creek is a gaining stream throughout most of its reach. In the Wahoo Creek Valley, Silver Creek is an entrenched stream. Silver Creek once flowed into Memphis Lake, and the outlet stream that drains Memphis Lake was the original channel of Silver Creek. However, a diversion channel redirected the upper portion of Silver Creek to Wahoo Creek near Memphis. In this report, "Silver Creek" refers to the stream that discharges to Wahoo Creek, and the smaller stream that drains Memphis Lake, which is often dry, is called "Lower Silver Creek".

A USGS gauge was located on Silver Creek near Ithaca from 1949 until destroyed in a flood in 1958. The flow duration statistics for Silver Creek are as follows (stage data was not available):

USGS Gauge Location	Exceedance Frequency (percent)	Flow (cfs)	Flow (gpm)
Silver Creek - Ithaca Period of Record = 1949 to 1958	99	1.6	720
	90	2.7	1,200
	50	5.0	2,200

Because the stream flow data is from a period early in the development of groundwater for irrigation, and because Silver Creek is a gaining stream, the flow of which is affected by the groundwater levels, the current stream flow may be less due to the historic decline in regional water levels.

2.5 DRAIN TILES

Many of the farm fields in the Platte Valley and Wahoo Valley use agricultural drain tiles to keep the water level below ground surface. This area is generally thought to be sub-irrigated, meaning this area does not typically require the use of irrigation wells. In the Platte Valley, drains have been identified in the silty clay loam soils near Clear Creek. The soils in the remainder of the Platte Valley are silty and sandy loams, with sandy loam adjacent to the banks of the Platte River. The soils in Wahoo Valley are also silty clay loams. The drain tiles are generally 3 ft below ground surface (CAI, 2005).

In 1993, Woodward-Clyde used black and white and color infrared photographs, as well as field observations to identify farm fields in the Platte Valley that may be artificially drained. In RDGM IV, drain tiles were simulated in two areas:

1. Section 13, T14N, R9E, and the western portion of Section 18, T14N, R8E.
2. Sections 1 and 2, T13N, R9E and Sections 35 and 36, T14N, R9E; and the eastern portions of Section 34, T14N, R9E, and Section 3 T13N, R9E; and a strip approximately 500 ft wide along the southern portion of Section 26 and the southeastern quarter of Section 27, T14N, R9E.

The "Groundwater Flow Net Analysis" (Woodward-Clyde, 1993a) states that "...the majority of farmlands adjacent to the piezometer alignment have been visually noted to contain drain tiles and discharge ditches."

The east-west piezometer alignment was located along the half-section road between Johnson and Clear Creeks in Sections 27 and 26 T14N, R9E.

In March 2005, CAI interviewed a local drain tile contractor and conducted a field reconnaissance, and revised the area in which drain tiles are believed to be present to the following areas (CAI, 2005):

1. Section 13, T14N, R9E east of Clear Creek, and the southeastern quarter of Section 12, T14N, R9E east of Clear Creek.
2. The eastern portion of Section 34, T14N, R9E.

On July 18, 1990 the USGS measured 0.51 cfs flowing from a single drain tile into Johnson Creek between the Memphis gauge and the confluence with Clear Creek. This represents one-fourth to one-half the flow of Johnson Creek.

2.6 GROUNDWATER FLOW

2.6.1 Groundwater Flow Directions

In the study area (**Figure 2-4**) the groundwater flow direction in the Todd Valley is generally southeast, along the trend of the valley. Groundwater in the Todd Valley discharges into Silver Creek to the southwest of the FNOP, into the Wahoo Valley aquifer to the south, and into the

Platte Valley aquifer to the southeast. Locally, the aquifer discharge zones alter the groundwater flow direction. Specifically, in the southwestern portion of the model area, the influence of Silver Creek and Wahoo Creek creates a more southerly groundwater flow direction than observed in the axis of the Todd Valley. Along the eastern boundary of the former FNOP, the groundwater flow direction in the Todd Valley becomes more easterly as it discharges into the Platte Valley aquifer at the contact between the Todd and Platte Valley aquifers (Woodward-Clyde, 1996a).

Groundwater flow in the Wahoo Valley aquifer is generally southeast with a southerly component near Silver and Wahoo creeks. The Wahoo Valley aquifer receives a large amount of groundwater flux from the Todd Valley aquifer at the contact between the two aquifers.

The Platte Valley aquifer also receives a large amount of groundwater flux from the Todd Valley aquifer at the contact between the two valleys. The general groundwater flow direction of the Platte Valley aquifer is southeast as groundwater exits the Todd Valley and enters the Platte Valley. Near the Platte River the general groundwater flow direction in the Platte Valley aquifer is south, paralleling the river. However, there is also a westerly component to groundwater flow away from the river. This is due to the losing nature of the Platte River within the study area. The groundwater flow directions from the Todd Valley side and the Platte River side of the aquifer converge on Clear Creek.

2.6.2 Gradients

Groundwater gradients (**Figure 2-4**) in Todd Valley range from approximately 10 ft/mile in the western portion to 15 ft/mile in the southeastern portion. Gradients in the Platte Valley and Wahoo Creek valley are approximately 5 ft/mile.

Vertical gradients are typically upward, except near the NRD reservoir or near extraction wells. In March 2006, groundwater levels were an average of 0.04 ft higher in the intermediate wells than in the shallow wells (**Figure 2-4** or **Table 2-3** and **Table 2-5**).

In 1993, a row of temporary piezometers was installed in the alluvium from the east side of Johnson Creek to the west side of Clear Creek approximately 1.5 miles upstream of their confluence. The alignment consisted of eleven clusters of four piezometers each. Upward gradients were observed at all of the clusters (Woodward-Clyde, 1993a).

Two temporary clusters of three piezometers each were installed near EW-12 and Silver Creek in September 2004. Groundwater elevations were 0.10 ft higher in the deep piezometer than in the shallow piezometer in cluster PZ-1 near EW-12, and the difference was 0.18 ft in the cluster near the north bank of Silver Creek.

2.6.3 Potentiometric Surface

Figure 2-4 shows the measured groundwater elevations on March 29, 2006 and the interpreted potentiometric surface. This surface was based on water levels from the following sources:

- USACE monitoring wells, observation wells, and piezometers
- Lower Platte North Natural Resource District (LPNNRD) piezometers and irrigation wells (LPNNRD, 2006)
- MUD piezometers (LPNNRD, 2006)

- LWS piezometers (LPNNRD, 2006)
- USGS piezometers and irrigation wells (USGS, 2006a)
- USACE surface water staff gauges
- USGS surface water-gauging stations (USGS, 2006b)

The March 2006 groundwater elevations for the USACE monitoring and observation wells are in **Table 2-3**. The naming convention for the USACE wells is "B" for shallow, "A" for intermediate, and "D" for bedrock. This applies to all the USACE monitoring wells except clusters MW-16 through MW-20, which use "A" for bedrock, "B" for intermediate, and "C" for shallow. Well construction details are presented in **Table 2-4**.

The groundwater elevations for the LPNNRD, LWS, MUD, and USGS wells are presented in **Table 2-5**. The quality of the USGS water level data is uneven due to the construction of some of the wells (e.g., some are irrigation wells), due to the uncertainty in the measurement datum, and due to the fact that not all wells were measured on March 29, 2006, but were measured between February and April 2006. The USGS wells were mainly used to establish regional water levels in the margins of the model. Most of the USGS wells are not surveyed, and are measured from ground surface. The ground surface elevation was estimated using the NED 10-meter DEM topographic surface. Where nearby data points conflicted, preference was given to data from surveyed wells such as USACE monitoring wells, observation wells, and piezometers. In outlying areas where surveyed wells were not available and the only water levels were from the USGS database, conflicts between nearby data points were resolved by comparing the water levels to "Configuration of Water Table, 1995" (CSD, 1996b).

The water level at MW-3A, which is located more than 1 mile upgradient of EW-8 near LL1, is about 4 ft lower than when pumping started in 2002, representing about a 4% decline in saturated thickness.

The groundwater elevations were measured again on October 30, 2006 (**Tables 2-3** and **2-5**). **Figure 2-5** presents the interpreted potentiometric surface of October 30, 2006 with comparison to the interpreted potentiometric surface of March 29, 2006. The comparison suggests that the groundwater levels at both times are very similar.

2.7 GROUNDWATER RECHARGE

According to "Regional Estimation of Base Recharge to Groundwater Using Water Balance and Base-Flow Index" (Szilagyi et al., 2003), long-term mean annual base recharge in southeastern Saunders County is between 90 and 110 mm (3.5 and 4.3 inches). Szilagyi et al. (2003) estimated the long-term mean annual base recharge by multiplying the long-term mean annual runoff (the difference between precipitation and evapotranspiration) and the base flow index (BFI).

2.8 PRECIPITATION

Monthly precipitation at Mead and Ashland are presented in **Tables 2-6** and **2-7**, respectively. The mean annual precipitation is 27.4 inches at Mead and 28.4 inches at Ashland (MRCC, 2006). From 2002 through 2005, precipitation at Mead was a total of 7.4 inches less than normal, or 93% of normal over the period (MRCC, 2006).

2.9 EVAPOTRANSPIRATION

The estimated long-term mean annual evapotranspiration in southeastern Saunders County is approximately 600 mm, or 24 inches (Szilagyi et al., 2003).

2.10 AQUIFER WITHDRAWALS

According to "Water Use in Nebraska, 2000" (USGS, 2000), the major uses of groundwater in Saunders County are for irrigation and public water supply (chiefly the LWS Ashland well field). The supply wells of the Mead Cattle Company, a large feedlot located north of LL2, are registered as commercial/industrial rather than livestock.

	Public Supply	Domestic	Irrigation	Industrial	Live-stock	Total
Average Volume (MGD)	36.14	1.18	82.45	0.12	0.85	120.74
Percent of Total	30%	1.0%	68%	0.1%	0.7%	

2.10.1 Municipal Water Supplies

2.10.1.1 Metropolitan Utility District (Omaha) Platte West Field

The Omaha MUD Platte West Field is located on both sides of the Platte River near Venice. Construction began in 2004 and the well field is scheduled to begin production in April 2008. The Platte West Field is permitted to pump up to 104 million gallons on any given day but is restricted to an annual average of 52 MGD. MUD also operates large well fields near the Platte River in Sarpy County and near the Missouri River in Douglas County.

The field is located in a north-south trending area of increased saturated thickness of the Platte River alluvial aquifer, and in an area in which the Platte River recharges the aquifer. The field has 42 production wells classified as either "storage wells" (over 500 ft from the river) that will produce groundwater from aquifer storage, or "river wells" (within 500 ft of the river) that are expected to produce groundwater derived largely from recharge from the river (CAI, 2005). During average river stage, the base well field production will be provided by the river wells in order to reduce the number of wells operating and to preserve groundwater available from aquifer storage for use during low river flow conditions (CAI, 2005).

The distribution of pumping rates among individual wells at the permitted annual and seasonal rates for the MUD Platte West Field is presented in **Table 2-8**.

2.10.1.2 Lincoln Water System Ashland Field

The well field near Ashland supplies nearly all the water for the LWS. Therefore, the total pumping rate of the well field can be estimated using the projected water demand for the entire system provided in the "Lincoln Water System Facilities Master Plan" (Black & Veatch, 2003). Currently the average annual pumping rate for the LWS Ashland well field is approximately 40 MGD. The summer seasonal average pumping rate is approximately 62 MGD with a maximum daily demand of approximately 114 MGD. According to the Master Plan, the average daily pumping rate will increase to 42 MGD in 2010, 52 MGD in 2025, and 76 MGD in 2050. The Master Plan projects the summer seasonal yield will increase to 65 MGD in 2010, 81 MGD in 2025, and 118 MGD in 2050.

Estimated seasonal and annual pumping rates for the LWS Ashland well field are presented in **Table 2-9**. The LWS monthly pumping rates for the well field from 2002 to August 2006 are presented in **Table 5-6**.

2.10.1.3 Other Municipal Water Supplies

The estimated pumping rates for the City of Ashland, and the villages of Mead and Memphis are presented in **Table 2-10**.

Ashland

The City of Ashland has four registered municipal supply wells, the newest of which was installed in 2006 but is registered as inactive. The total pumping rate for the other three wells according to registration records is 1,700 gpm (2.4 MGD). According to "Estimated Water Use in Nebraska, 1995" (NNRC, 1998) the per capita public water supply use in Saunders County was approximately 100 gallons/day (gpd). With a 2005 population of 2,493 (NDNR, 2006), average water use based on per capita usage is approximately 173 gpm, or one-tenth the registered pumping capacity.

Memphis

The Village of Memphis has two registered public supply wells with a total pumping rate of 500 gpm according to registration records. Assuming a 100 gpd per capita water use (NNRC, 1998), and a 2005 population of 109 (NDNR, 2006), the average water use based on per capita usage is approximately 8 gpm.

Mead

The Village of Mead has four registered public supply wells with a total pumping rate of 1,050 gpm according to registration records. Assuming a 100 gpd per capita water use (NNRC, 1998), and a 2005 population of 623 (NDNR, 2006), the average water use based on per capita usage is approximately 44 gpm.

2.10.2 Irrigation

Approximately 422 irrigation wells are registered in Townships 13 through 15 North, Ranges 8 through 10 East, and the Saunders County portion of Township 12 North, Range 9 East (NDNR, 2006). Of these, 357 are registered as "active", and 339 of the active wells are within the model domain. The registered pumping rate, which in most cases is probably intended as a maximum pumping rate, averaged 750 gpm for these wells. The average acreage on the registration is 130 acres, which is close to the size of a quarter-section center pivot.

The average pumping rates from 1996 to 2005 were used for the Agriculture Research and Development Center (ARDC) irrigation wells. Pumping rates for other irrigation wells were estimated using the registered acreage, and the average net irrigation requirement. Seasonal crop water use (evapotranspiration) is 25-28 inches for corn, 22-25 inches for soybeans, and 34-36 inches for alfalfa in eastern Nebraska (IANR, 1990). According to Appendix C of the "2006 Annual Evaluation of Availability of Hydrologically Connected Water Supplies" (NDNR, 2005), the evapotranspiration for fully irrigated corn is 29.47 inches, and the average net irrigation requirement in fine sandy loam was 6.68 inches, based on growing season temperature and

precipitation at Wahoo for the period 1949-2004. This results in an average pumping rate of 180 gpm for a 130-acre center pivot over an entire irrigation season.

In quarter sections with more than one registered active irrigation well, it is assumed that only one well is active per quarter section. The existence of dormant wells still registered as "active" is evident in the ARDC pumping records, which show many wells that are not used every year. Dormant, backup, or underused wells are also evident in the registration records, which show sections with total registered acreage greater than 640 acres. In quarter sections with more than one well, the newest well is assumed to be active. This results in 278 of the active wells within the model domain that are assumed to be pumping out of 339.

The estimated irrigation pumping rates over irrigation season of three months and the annual average based on the ARDC data are presented in **Table 2-11**.

For the purpose of modeling historical plume migration pathways and history matching of plume migration, the historical irrigation data from 1955 to 2000 were also collected and presented in **Table 2-12**.

2.10.3 Former Nebraska Ordnance Plant Containment System

Extraction wells EW-1 through EW-10 began operation in February 2002. EW-12 began pumping on February 13, 2006. The total pumping rate has declined from 2,600 gpm at start-up to 2,200 gpm in March 2006 (not including EW-12) and 2,300 gpm in August 2006 (not including EW-12). One of the contributing factors to the decline is a 4% decline in saturated thickness over the period. From startup to February 2006, water levels have declined 3.7 ft at MW-3A, located approximately 6,500 ft upgradient of EW-8.

The March 2006 pumping rates for the extraction wells are summarized in the following table.

Containment Well ID	March 2006 Pumping Rates (gpm)
EW-1	167
EW-2	149
EW-3	217
EW-4	104
EW-5	225
EW-6	261
EW-7	306
EW-8	305
EW-9	151
EW-10	306
EW-11	0
EW-12	325
EW-13	0

Pumping rates since February 2002 are detailed in **Table 2-13**.

2.11 HYDRAULIC PROPERTIES

2.11.1 Hydraulic Conductivity

2.11.1.1 Pumping Tests

As part of the operation of the containment system, aquifer test analyses were conducted for all the extraction wells that had observation wells at the time of the one-year containment evaluation (URS, 2004c): EW-1, EW-3, EW-5, EW-7, EW-8 and EW-10. A summary of the results of these aquifer tests is presented in the table below:

Containment Well	Transmissivity (ft^2/day)	Saturated Thickness (ft)	Hydraulic Conductivity (ft/day)
EW-1	7,400	19	389
EW-3	17,100	48	356
EW-5	10,400	55	189
EW-7	7,000	45	155
EW-8	10,100	109	93
EW-10	8,900	72	123

The RDGM IV used a calibrated value of 400 ft/day for the hydraulic conductivity of the Platte Valley. For the Todd Valley aquifer, the RDGM IV calibrated hydraulic conductivity was 130 ft/day, which was based on the geometric mean of the pumping test results from EW-3, EW-5, EW-7, EW-8 and EW-10, and slug tests from MW-21A&B, MW-26A&B and MW-53A&B.

In January 2006, distance-drawdown analyses of two 72-hour constant rate tests for EW-12 at 275 gpm and 327 gpm both yielded hydraulic conductivities of approximately 20 ft/day. Since EW-12 began pumping in February 2006, a prominent cone of depression has developed, with inward gradients extending east to EW-13, and west and south to Silver Creek. As a point of comparison, the saturated thickness at EW-12 (85 ft) is similar to the saturated thickness at EW-10 (72 ft), but EW-12 has one-third the specific capacity of EW-10 (6 gpm/ft versus 18 gpm/ft).

During development of EW-13, pumping rates greater than 50 gpm could not be sustained, suggesting that it is installed in an area of the Wahoo Valley aquifer that has a hydraulic conductivity even lower than the hydraulic conductivity at EW-12.

In November/December 2006 observation wells were installed near EW-4, EW-6, and EW-9. Distance drawdown analyses of data collected at these wells and at EW-12 before, during, and after a three-day system shutdown yielded the following results:

Containment Well	Transmissivity (ft^2/day)	Saturated Thickness (ft)	Hydraulic Conductivity (ft/day)
EW-4	6,500	43	150
EW-6	9,000	32	280
EW-9	8,000	43	190
EW-12	1,800	80	22

2.11.1.2 Slug Tests

Remedial Investigation Slug Tests

Slug tests were performed with a solid slug at four clusters (Woodward-Clyde, 1993b):

Platte Valley Aquifer

Well	Hydraulic Conductivity (ft/day)
MW-46A	56
MW-46B	58

Todd Valley Aquifer

Well	Hydraulic Conductivity (ft/day)	Well	Hydraulic Conductivity (ft/day)
MW-21B	95	MW-21A	120
MW-26B	110	MW-26A	4.0
MW-53B	33	MW-53A	200

The results are significantly different for the intermediate and shallow screen intervals. Although slug test values may only be representative of local conditions, they are an indication of the heterogeneity in the aquifer.

Slug Tests in Temporary Piezometers near EW-12 and Silver Creek

In September 2004 (URS, 2004d), two clusters of piezometers were installed near the proposed location of EW-12 (PZ-1), and downgradient of EW-12 near MW-80 on the north bank of Silver Creek (PZ-2). Each cluster had a shallow (approximately 21 ft below ground surface [bgs]), intermediate (approximately 41 ft bgs), and deep (approximately 80 ft bgs) piezometer. The piezometers were tested using pneumatic slug techniques, and yielded average hydraulic conductivities ranging from 2.2 ft/day in one of the deep piezometers (PZ-1W), and over 154 ft/day in one of the intermediate piezometers (PZ-2C).

Piezometer	Hydraulic Conductivity (ft/day)	Screen Interval (ft BGS)
PZ-1E	35	76.5-77.5
PZ-1C	37	38.1-39.1
PZ-1W	2.2	18.1-19.1
PZ-2E	30	74.0-75.0
PZ-2C	154	36.5-37.5
PZ-2W	42	17.5-18.5

Although the borings in which the piezometers were installed were not logged, a geologic boring near the PZ-1 cluster contained layers of sand alternating with sand and gravel layers. The four temporary piezometers with hydraulic conductivities between 30 and 42 ft/day were presumably screened in sand. The deep piezometer near EW-12 with a hydraulic conductivity of 2 ft/day

was possibly screened in clayey material above the shale noted in the geologic boring. The response in PZ-2C showed minor head dependent effects, so 154 ft/day is considered a minimum, and it is assumed that it was screened in gravel.

The high end of reasonable assumptions is that the highest hydraulic conductivity, 190 ft/day, is typical of the gravel layers, and that 42 ft/day is typical of sand layers. Although there are clayey or silty layers, the high end of assumed values is that they have the same conductivity as the sand layers (42 ft/day). A weighted average of the stratigraphic sequence in the geologic boring using 190 ft/day and 42 ft/day is approximately 77 ft/day. This is lower than the hydraulic conductivity of 93 ft/day from the EW-8 pumping test (URS, 2004d), but higher than the hydraulic conductivity of the EW-12 pumping tests (22 ft/day).

Direct-Push Slug Tests near EW-12

Direct-Push slug tests were performed at locations 200 ft east (DPK-1) and 200 ft west (DPK-2) of GP-72. GP-72 is approximately 250 ft north-by-northwest of EW-12 near the edge of Silver Creek/Wahoo Creek valley.

Location/ Interval	Hydraulic Conductivity (ft/day)
DPK-1-70	43
DPK-1-91	20
DPK-1-105	24
DPK-2-70	1.8
DPK-2-82	10
DPK-2-91	28

These are similar to the tests in temporary 1-inch piezometers performed in 2004, and it is possible that the direct-push slug tests were performed in similar materials as the temporary piezometers. DPK-1-70, DPK-1-91, DPK-1-105, and DPK-2-91 have hydraulic conductivities ranging from 20 to 43 ft/day, and are possibly screened in sands. DPK-2-70 (2 ft/day), and DPK-2-82 (10 ft/day) are possibly screened in fine materials such as clay, silt, and/or very fine sand.

2.11.1.3 Hydrologic Investigations

Piskin (1971) estimated hydraulic conductivity based on grain size analyses from 84 test borings on the University of Nebraska Lincoln (UNL) property. The estimates ranged from 20 to 220 ft/day with a mean of 140 ft/day.

"Transmissivity of the Principal Aquifer, 2005, Fremont/Omaha quadrangle" (CSD, 2005) (**Figure 2-6**) was based on aquifer thickness, grain size analyses from test holes, and specific capacities on registrations. The CSD map indicates a transmissivities between 20,000 and 50,000 gallons per day (gpd)/ft (2,700 ft^2/day to 6,700 ft^2/day) in the Wahoo Creek valley and southeastern Todd Valley, and roughly 100,000 gpd/ft (13,000 ft^2/day) near the FNOP containment wells in Todd Valley.

The CSD map indicates an area of high transmissivity (150,000 gpd/ft or 20,000 ft^2/day) in Todd Valley near the NRD reservoir and Johnson Creek. This may be based on specific capacities from wells in materials similar to those that yielded the high slug test result from the

intermediate well MW-53A. Souders (1967), however, presents a map of transmissivity that indicates an area of low transmissivity (26,000 to 60,000 gpd/ft, or 3,500 to 8,000 ft^2/day) in Todd Valley near Johnson Creek, possibly due to the higher bedrock elevations in the area, and perhaps based on findings similar to the greater thickness of fine grained layers observed in some of the monitoring well borings near the NRD reservoir.

2.11.1.4 Lincoln Water System Ashland Well Field

Describing the Platte River Alluvium near the LWS Ashland well field, Ayers (1990) states that, "A wide range of hydraulic conductivity for the alluvium exists, however, a generally accepted value is 350 ft/day."

The following hydraulic conductivity estimates were provided in Table 1 of Ayers (1990):

Source	Year	K (ft/day)	Method
Ferris et al.	1962	325	River-stage Fluctuations
Marlette	1968	364	Capacity Tests (?)
Zitterkopf	1970	526	Pump Tests
Layne-Western	1984	369	Pump Tests
Layne-Western	1984	1299	Pump Tests
Groundwater Management, Inc.	1987	350	Model Calibration
Ted Zorich and Associates, Inc.	1989	481	Pump Tests

The Ayers (1990) model used a hydraulic conductivity of 0.134 ft/day for the "clay unit", which consists of the overbank alluvial fines in the Platte Valley.

2.11.1.5 MUD Preliminary Engineering Study

The groundwater model developed by Layne Geosciences, Inc. (LGI) is documented in MUD's "Preliminary Engineering Study and Pre-Design Report for Platte West Water Production Facilities" (HDR, 1993). The hydraulic conductivities used in the model were 350 and 600 ft/day in the Platte Valley aquifer, and 120 ft/day in the Todd Valley aquifer.

Two-day pumping tests conducted on three test wells were presented in the MUD Preliminary Engineering Study. Test well 91-1 is located near the Platte River in the Douglas County portion of the well field near PW04-17 in Section 7, T14N, R10E. Test well 91-2 is located in the Saunders County portion and is possibly the same well as PW91-30 in Section 19, T14N, R10E. Test well 91-3 is located at the north end of the Douglas County portion of the well field in Section 6, T14N, R10E, and is likely the same well as PW91-3.

The tests yielded the following results:

Test Well	Pumping Rate (gpm)	Trans-missivity (ft^2/day)	Aquifer Thickness(ft)	Hydraulic Conductivity (ft/day)
91-1	1,726	51,800	85	609
91-2	1,500	47,100	77	612
91-3	1,552	79,600	94	847

2.11.1.6 MUD Platte West Pumping Tests

The MUD Platte West wells underwent 48-hour pumping tests followed by recovery tests. Only the minimum and maximum analytical results were presented for the constant rate tests in the "Phase II Platte West Well Field/Groundwater Modeling Study" (CAI, 2005). The MUD pumping test results appear to have an unusually high degree of variability for such a permeable aquifer. Presumably, each analytical result was based on the time-drawdown analysis from one observation well. Some of the minimums and maximums were noted to be less reliable by Olsen Associates, but the minimum or maximum of the tests that were regarded to be reliable were not presented in their stead. A single transmissivity value for the recovery test was presented. The saturated thicknesses were not presented, so the hydraulic conductivities in **Table 2-14** are based on saturated thicknesses estimated from the Bedrock Surface Map (**Figure 2-2**) and the March 29, 2006 Potentiometric Surface (**Figure 2-4**). The average minimum hydraulic conductivity was 332 ft/day and the average maximum hydraulic conductivity was 580 ft/day. For each well, only one result was given for the recovery test. The average recovery test hydraulic conductivity was 308 ft/day.

2.11.2 Storativity

The following values for storativity from the tests in MUD's Preliminary Engineering Study (HDR, 1993) suggest that test well 91-3 (at the north end of the Douglas County portion of the well field) is in an area under confined conditions:

Test Well	Storativity
91-1	0.61
91-2	0.19
91-3	0.04

The MUD October 2005 model (CAI, 2005) used a specific yield of 0.15 for transient simulations. RDGM IV used 0.05 for the Platte Valley aquifer, 0.39 for the loess/fine alluvium, and 0.15 for the Todd Valley aquifer.

Ayers (1990) stated that a generally accepted specific yield value for the Platte Valley aquifer is 0.15. Ayers used a value of 0.015 for the specific yield of the clay unit, and a specific storage of 9.9×10^{-5} for the Platte Valley aquifer.

Storativities were estimated in the Containment Evaluation Work Plan (CEWP) (URS, 2002b) for EW-1 and EW-8, and in the Initial Containment Evaluation (ICE) (URS, 2003a) for EW-5, EW-7 and EW-10. Storativities were estimated again for the five wells in the One Year Containment Evaluation (1YCE) (URS, 2004c). As the table below suggests, estimates of storativity increased in all wells except EW-3 after one year of pumping:

Containment Well	Storativity (CEWP or ICE)	Storativity (1YCE)
EW-1	0.06	0.12
EW-3	0.14	0.13
EW-5	0.18	0.23
EW-7	0.14	0.24
EW-8	0.12	0.39
EW-10	0.11	0.32

2.11.3 Anisotropy

No vertical anisotropy was used in the RDGM I through RDGM IV models, perhaps in an effort to be conservative. This assumption is likely to be excessively conservative in that it would cause the model to underpredict capture in the vertical plane. Also in view of the highly stratified nature of the aquifer materials, the assumption of no vertical anisotropy is not realistic, and would cause the model to underpredict capture. Generally, horizontal hydraulic conductivities in sandy aquifers are approximately 10 to 100 times higher than vertical hydraulic conductivities (Spitz and Moreno, 1996).

2.11.4 Riverbed Conductance

The MUD Preliminary Engineering Study (HDR, 1993) cites a conductance of 6.0 ft/day for the sediments underlying the Platte River based on a study for the Lincoln Well Field (TZA, 1989). According to Ayers (1990), however, the value from TZA is actually 6 d^{-1}, and is the ratio of riverbed hydraulic conductivity to riverbed thickness. The Preliminary Engineering Study used a conductance for the Elkhorn River of 0.5 ft/day, based on "LGI's experience in studying similar rivers" (HDR, 1993).

The calibrated riverbed conductance in the MUD October 2005 model (CAI, 2005) for the Platte and Elkhorn rivers was 6 ft/day, and 2 ft/day for the creeks.

3.1 PLUME CHARACTERIZATION

The distributions of the main contaminants of concern, RDX and TCE, were interpreted based on recently collected groundwater data from multiple investigations, the largest and most recent of which were the Fall 2005 MW-85/Johnson Creek Vicinity Groundwater Investigation and the Spring 2006 MUD Baseline Groundwater Investigation (URS, 2006). The analytical results used in the characterization are presented in **Tables 3-1** through **3-4**, and the plume interpretations are presented on **Figures 3-1** through **3-4**. The time frame for the collection of the majority of the data used in the re-interpretation of the RDX and TCE plumes is from 2003 to 2006.

Approximately 90 percent of the samples used to characterize the plumes were direct-push samples. Generally, three direct-push samples were collected at each location, at the top, middle and bottom of the unconsolidated aquifer. For interpretation, the direct-push samples were divided into two depths instead of three, in order to match the monitoring well designations: shallow "B" monitoring wells (which are closest in depth to the middle direct-push sample) and intermediate "A" monitoring wells (which closely correspond to the bottom direct-push sample). "Shallow" direct-push samples were collected in the upper half of the saturated thickness of the unconsolidated aquifer, where it is unconfined, or in the upper half of the aquifer where it is confined. "Intermediate" samples were collected in the lower half. If more than one direct-push sample was collected in one half of the aquifer (typically the shallow half), the highest concentration was used in the interpretation.

The direct-push samples used to characterize the LL1 TCE and RDX plumes were collected in March 2003, and additional samples were collected at the leading edge in June 2004 and February 2006. Monitoring wells at the leading edge were sampled in March 2006.

Direct-push samples used to characterize the LL2, LL3, LL4, and Burning Grounds RDX plumes were collected in October-November 2005, and January-March 2006.

The most recent sample data from each monitoring well was used. The majority (approximately 70 percent) of the monitoring well samples, including all of the leading edge and downgradient samples, were collected in September 2005, December 2005, or March 2006. A few samples, particularly background monitoring wells or monitoring wells inside the load lines, were sampled quarterly in the 1990s for plume characterization and then removed from the frequent groundwater monitoring list because of their negligible significance to containment monitoring. Most of these are non-detect, but those with detects inside the source areas are more likely to over-represent rather than under-represent the current concentrations due to plume migration.

The sampling events and number of samples for shallow and intermediate RDX and TCE plumes are presented in **Table 3-5**.

3.2 POTENTIAL SOURCE AREAS

The load lines were active during World War II and the Korean Conflict. Based on the available data, the RDX plumes appear to emanate from the load line areas. 2,4,6-Trinitrotoluene (TNT) was handled at all four load lines, and 1,3,5,7-tetranitrol-1,3,5,7-tetrazine (HMX) was handled at LL2, but these compounds are almost universally co-located with the more prevalent RDX. The load lines are identifiable on road maps by the distinctive diamond-shaped roads surrounding their former locations. The load lines are numbered 1 through 4 from west to east.

The LL2 RDX plume is the largest and has the highest concentrations, and the LL4 plume is the smallest and least concentrated.

Potential source areas for the "Burning Grounds" RDX plume include a cluster of areas of concern east of LL4 and west of the NRD reservoir consisting of two former burning grounds, the Potential Landfill area, the former Proving Range, and the former Landfill area.

The potential source area for the LL1 TCE plume are the north end of the load line formerly used as the Air Force Ballistic Missile Division (AFBMD) Tech Area, where TCE was allegedly disposed in ditches some time between 1959 and 1964. Although the upgradient portion of the LL1 TCE would be expected to have higher concentrations than the downgradient portion, the sharp decline in concentration in the middle of the plume length suggests that an earlier or more dilute release may have been followed by a higher concentration release. Alternative or additional contributing factors may be longitudinal dispersion, the effect of EW-8, or the increase in aquifer transmissivity near this point.

The primary source area for the AMA TCE plume is 1 mile north of LL4, where TCE was allegedly used to clean liquid oxygen pipelines around 1959 and disposed on the ground.

3.3 PLUME INTERPRETATION

Shallow RDX concentrations are generally higher than the concentrations in the intermediate interval. The TCE concentrations near the source areas are higher in the shallow zone, but concentrations in the downgradient portions of the plumes tend to be slightly higher in the intermediate interval than in the shallow interval. **Figures 3-1** through **3-4** are conservative interpretations of groundwater sample data that illustrate the extent of groundwater contamination. These contour maps of RDX and TCE concentrations were prepared for the purpose of creating initial concentrations for transport simulations, and initial extents for particle tracking analyses. In some cases these interpretations may over-estimate the extent and mass of the plumes, because plumes are extrapolated beyond the farthest detection to the closest non-detect. Information from the shallow interval is presumed to be relevant to the interpretation of the intermediate interval, and vice-versa. The highest concentrations in some of the plumes are not based on a data point in that layer, but are based on the fact that the other layer has a high concentration at that location. In situations where non-detects or low concentrations are located in the middle of plumes, many of these are considered anomalous since they are upgradient, downgradient, and/or sidegradient of higher concentrations. Non-detects from direct-push data inside the plumes can be misinterpreted, because the short sample interval makes it possible that the sample was collected from a fine sand or silt, and the plume is passing through more permeable material above and/or below the direct-push sample. This is also true of monitoring well samples to a lesser extent. However, even if unrealistically low concentrations were specified as the initial concentrations for transport simulations, dispersion and mixing in the aquifer through time would cause those concentrations to become similar to the surrounding plume. The intention of these interpretations is to be conservative regarding plume mass, and to avoid long-term transport simulations in which plumes disperse more quickly than is realistic.

Comprehensive TCE plume characterizations similar to the 2002-2004 LL1 plume and Fall 2005/Spring 2006 AMA plume direct-push investigations are not available for earlier periods in order to provide a full plume comparison over time for transport calibration. Therefore, graphs

of TCE concentrations over time for select well clusters are provided on **Figures 3-3** and **3-4** to show plume migration trends.

TCE concentrations are decreasing at monitoring well clusters near the north and west sides of the LL1 source area. East of the middle of the LL1 plume, concentrations in MW-21A and MW-24A have been increasing since EW-8 began pumping in 2002. Since these wells are east of the axis of the plume, this suggests that the EW-8 pumping has shifted the axis of the plume slightly towards the west. Concentrations in the leading third of the LL1 plume are much lower than the upgradient portions of the plume. Concentrations at MW-90B, which is located upgradient of EW-12, have shown an increasing trend. Concentrations in MW-80A, which is downgradient of EW-12, began declining after EW-12 began pumping.

Concentrations in MW-58 near the AMA plume source area declined to approximately 20 µg/L in 1995 and stabilized near that level until the well was abandoned after the 2000 sampling event. As would be expected, concentrations in MW-44, which is located near the downgradient end in the center of the plume, are increasing due to migration towards the FNOP containment system. Concentrations in MW-45, which is located east of Johnson Creek have declined since pumping began at EW-1 in 2002.

There have been no specific actions to address high concentration areas of TCE in groundwater in the immediate vicinity of LL1 and the Atlas Missile Area. The reason for declining levels of TCE in groundwater in high concentration areas is related primarily to groundwater transport diffusion and dispersion.

3.4 FOCUSED REMEDIATION

Two pilot Groundwater Circulation Wells (GCW) were installed in 2000 and are still operating. One GCW system, GCW-1, is located near MW-40 in an area of elevated TCE concentrations north of LL4 and southeast of the former AMA. TCE is extracted from groundwater with an air stripper, and the treated groundwater is re-infiltrated into the aquifer at a rate of approximately 50 gpm. From 2005 to 2007, GCW-1 has removed approximately 64.4 lbs of TCE. GCW-2 is located in the center of the RDX plume southeast of LL2 (URS, 2001). RDX is treated with ultraviolet light (UV), and the treated groundwater is re-infiltrated into the aquifer at a rate of approximately 20 gpm. From 2005 to 2007, GCW-2 has removed approximately 1.82 lbs of RDX.

Although it is not part of focused extraction, a Biologically Active Zone Enhancement (BAZE) Pilot Study involving injection of acetate to enhance in situ RDX degradation was implemented in the LL2 plume approximately 1 mile southeast of GCW-2.

Monitoring well and direct-push groundwater data associated with the GCW Pilot Study (URS, 2001a) and the BAZE Pilot Study (URS, 2004a) were used to characterize current plume concentrations. The data included:

- VOC data from direct-push locations GP-01 (GCW) through GP-51 (GCW) near GCW-1
- VOC data from MW-72 through MW-78 surrounding GCW-1
- Explosives data from MW-65 through MW-71 surrounding GCW-2
- Explosives data from direct-push locations GP-01 (BAZE) through GP-13 (BAZE)
- Explosives data from MW-01 (BAZE) through MW-11 (BAZE)

4.1 CODE SELECTION

The three-dimensional finite difference groundwater flow model computer code MODFLOW (version MODFLOW-96) (McDonald and Harbaugh, 1988) is selected for this project for its wide use and acceptance by engineering and regulatory communities. The particle tracking code, MODPATH (Pollock, 1989), is selected to support the flow model calibration to evaluate flow pathways. The three-dimensional finite difference groundwater fate and transport code, MT3DMS, (Zheng and Wang, 1998), is selected to simulate plume migration. Groundwater Vistas IV (Rumbaugh, 2005) was the processing software used.

4.2 MODEL DOMAIN AND GRID

The numerical model domain covers a rectangular area of 200 square miles as shown on **Figure 4-1.** The model domain is much larger than the plume area of about 40 square miles. The selection of a larger model domain allows:

- Using natural boundaries as external boundaries to reduce potential boundary effects on simulation of remedial alternatives in the plume area.
- Simulating the stream-aquifer interactions that have a significant impact to the groundwater system.
- Simulating the proposed increase of groundwater extractions at the MUD and LWS well fields in the future.

The model origin (left-bottom corner) is at X= 2,590,000 ft and Y = 460,000 ft in Nebraska State Plane North American Datum 1983 (NAD 83) coordinates. There is no rotation of the model grid. Two model grids are developed, a coarse one and a fine one. The initial model grid is the coarse one, which includes 251 rows and 293 columns using variable cell size. In the area of interest (the plume area), the cell size is 200 ft by 200 ft. The cell size increases to 400 ft by 400 ft gradually outwards from the area of interest. During the later stages of calibration, it was found that the numerical dispersion of the fate and transport model is greater in the coarse grid model than in the fine grid model. Thus, the cell size was further refined to 100 ft by 100 ft in the plume area. Within the fine grid, there are 372 rows and 451 columns. The hydraulic properties and boundary conditions are consistent between the coarse and fine grid models. Both models will be reserved for future use as a multi-scale strategy for optimization of remediation (Babbar and Minsker, 2006) to increase computational efficiency.

The active model domain comprises portions of the Platte Valley Aquifer, the Todd Valley Aquifer, the Wahoo Valley Aquifer, and the uplands aquifer (located in the north central portion of the model). Areas outside of these permeable units, the uplands southwest of Wahoo Creek and the uplands east of the Platte River are defined as inactive areas using no-flow model cells.

4.3 MODEL LAYERS

The vertical discretization of the model generally reflects the subsurface geometry of the principal geologic units that overlie the bedrock. There are three layers in the model. Layer 1 simulates the low permeability materials immediately below ground surface, including the Peoria Loess in Todd Valley and the till uplands, and the fine Platte Valley and Wahoo Valley alluvium. Layers 2 and 3 simulate the principal aquifer, which in various portions of the model consists of

the Todd Valley alluvium, the Platte Valley alluvium, the Wahoo Valley alluvium, or the uplands aquifer. **Figure 4-2** shows three cross-sections of vertical discretization along model row 100, row 180, and column 175 (coarse model grid).

4.3.1 Layer 1

The topographic surface (**Figure 2-1**) is used as the top of Layer 1. The bottom of overbank deposits and the bottom of the loess (**Figure 2-3**) are used to define the bottom of Layer 1. In most of the Platte Valley the overbank deposits are saturated. The low permeability overbank deposits act as an upper semi-confining unit that impedes but does not prevent upward flow from the Platte Valley aquifer to the ground surface (Section 2.3.1).

In Todd Valley, the majority of Wahoo Valley and the till uplands area, the bottom of the loess/fine alluvium is much higher than the groundwater table (**Figure 4-2**), thus, the loess/fine alluvium is unsaturated (i.e., Layer 1 is dry in these areas). In the Wahoo Valley, the fine alluvium is relatively thick in the area south and southeast of the LL1 TCE plume. Therefore, Layer 1 in this section is saturated, whereas it is unsaturated in the rest of the Wahoo Creek valley.

4.3.2 Layers 2 and 3

Layers 2 and 3 simulate the Platte Valley alluvium, Todd Valley alluvium, Wahoo Valley alluvium, and the till and fluvio-glacial deposits in the uplands. The bedrock surface (**Figure 2-2**) is set as the bottom of Layer 3. There is no distinguishing difference between the upper and lower portion of the aquifers. The bottom of Layer 2 separates the shallow and intermediate-depth monitoring intervals in the plume area, and is at about the middle of the saturated thickness of the alluvial aquifer outside the plume area.

4.4 BOUNDARY CONDITIONS

The model boundary conditions (**Figures 4-3** through **4-5**) represent the hydrologic interactions between areas inside and outside of the model domain and the interactions between surface water and groundwater.

4.4.1 Rivers

The Platte River, Elkhorn River, and Wahoo Creek are simulated using the MODFLOW River package. The LWS well field located near Ashland next to the Platte River pumps significant amounts of groundwater (**Table 2-9**, Section 2.10.1), most of which is derived indirectly from the Platte River. The MUD Platte West well field near Venice will also indirectly derive much of its volume from the Platte River when it begins operation sometime in 2008. The amount of water lost from or gained by these rivers from the aquifer is only a small fraction of the river flow rates (Sections 2.4.1 and 2.4.2). It is expected that the effect of the stream-aquifer interaction on the river stage is negligible for the purposes of modeling.

4.4.1.1 Platte River

The width of the Platte River varies from 1,500 ft to 3,000 ft in the study area, as shown on **Figure 1-2**. The river is simulated with three to seven model cells in width based on the width of

the river as shown in the GIS hydrography layer (**Figure 1-2**), with each cell being approximately 400 ft wide.

The Platte River is hydraulically connected to the Platte Valley alluvium. The river cells are specified in Layer 2 (**Figure 4-4**). The groundwater flow between the river and the fine-grained overbank deposits of Layer 1 is assumed to be negligible compared to the hydraulic connection with the Platte Valley alluvium; thus, the river is simulated in Layer 2, not Layer 1.

4.4.1.2 Elkhorn River

The Elkhorn River (Section 2.4.2) is simulated with river cells in Layer 2, and is generally one or two model cells in width.

4.4.1.3 Wahoo Creek

Wahoo Creek, because of its relatively high flow rate (Section 2.4.5), is simulated using the River package, even though it is primarily a gaining stream. Use of the river package implies the stream-aquifer interactions can be in two directions (gaining or losing).

4.4.1.4 Open Water Bodies

Other water bodies, such as sand pits near the LWS Ashland well field, Memphis Lake, and Nebraska Research Reservoir (NRR) (**Figure 1-2**), are simulated using river cells.

4.4.2 Streams

Clear Creek, Johnson Creek, and Silver Creek are simulated using the MODFLOW Drain package (**Figure 4-4**). Ideally, as they may also receive surface water discharge, these streams can be simulated using the MODFLOW stream package to completely represent stream-aquifer interactions. However, since stream flow rates are not available for all the stream sections, using the MODFLOW stream package is not possible without assuming flow rates. As these streams in the study area are mainly gaining streams, they are simulated using drain cells. When the groundwater levels are higher than the surface water level, the creeks gain water from the aquifer through the drain cells, which supports the base flow in the creeks. When the groundwater level is lower than the surface water level, the drain cell will not transmit groundwater flow into the creek. Using the drain cells will avoid unrealistically pulling water from the "river" when the aquifer is under pumping and the groundwater level is below the bottom of the streambed. This was particularly a concern when Silver Creek was simulated using the river package in RDGM IV. During long term (e.g. greater than 20 years) flow simulations, regional groundwater levels in the aquifer declined, while the head in the river cells remained constant. The simulated decline resulted in a reverse of flow directions from Silver Creek which is inconsistent with the available data.

4.4.3 Agricultural Drains

Agricultural drain tiles east of Clear Creek and west of Johnson Creek are simulated in Layer 1 using the Drain package (**Figure 4-3**). Where the groundwater levels in the overbank deposits are higher than the bottom elevations of the drain tiles, groundwater discharges to the drain tiles. The bottom elevations of the drains are assumed to be 3 ft bgs.

4.4.4 General Head Boundaries

The northern and southern model boundaries for Layers 2 and 3 are simulated using general head boundaries as shown on **Figures 4-4** and **4-5**. Using general head boundaries instead of constant head boundaries could provide reasonable boundary fluxes in and out of the model domain when stresses within the model domain increase. The general head values are specified generally following the interpreted groundwater contours (**Figure 2-4**).

The external boundaries for Layer 1 are not specified (**Figure 4-3**), meaning they are no-flow boundaries by default. The flow in the silt/clay overbank deposits is primarily vertical, either downward in the upland groundwater recharge areas, or upward in the valley lowlands because of discharge from the Platte Valley alluvium and Wahoo Valley alluvium.

4.4.5 No-Flow Boundaries

The loess-mantled till uplands southwest of the Wahoo Valley and east of the Platte and Elkhorn rivers are the natural boundaries of the Wahoo Valley Aquifer and the Platte Valley Aquifer (**Figures 4-4** and **4-5**). Thus, they are excluded from the active model domain. There is no hydraulic data available in the loess mantled till uplands, but the very few irrigation wells in the area indicates that the permeability in the uplands is much lower than the major alluvial aquifers included in the active domain.

The loess-mantled till uplands southwest of the Wahoo Valley are separated from the area of interest by Wahoo Creek and Silver Creek, which are largely gaining streams. The potentiometric surface in the Wahoo Valley shows that flow is primarily parallel to the axis of the valley and therefore largely perpendicular to the valley wall. Flow from the loess-mantled till uplands, if any, would discharge to Wahoo Creek. The amount of flow is expected to be limited based on the relatively low transmissivity postulated by the University of Nebraska Conservation and Survey Division (**Figure 2-6**). This component is qualitatively considered in the flux calibration (Section 5.2.4.3).

The loess-mantled till uplands southwest of Wahoo Creek, and east of the Elkhorn River and the Platte rivers are simulated as an inactive area using no-flow cells.

The northwest edge of the model acts as a no-flow boundary. Flow is generally perpendicular to this edge of the model in this area. Furthermore, the western edge of the model is separated from the area of interest by Sand Creek, a gaining stream which parallels the edge of the model.

Groundwater model calibration is the most critical process in model development. Only a rigorously calibrated model can estimate meaningful future conditions for designing and managing remediation systems.

5.1 GROUNDWATER FLOW MODEL CALIBRATION APPROACH

To develop a numerical model that is representative of the site hydrogeologic conditions and is capable of serving the objectives of modeling, the model should be able to simulate the following calibration targets:

- Groundwater potentiometric surface under quasi-steady state condition
- Water budget, particularly the stream-aquifer interaction fluxes
- Transient processes
- Plume migration directions and speed

To meet these calibration targets, an iterative model calibration process was employed that includes the following components:

- Quasi-steady state calibration
- Five-year transient calibration
- Shutdown-test (i.e., short-term) transient calibration
- Quasi-steady state verification
- History matching of plume migration pathways using particle tracking
- History matching of plume migration using transport modeling

Through the iterative calibration processes, the hydrologic and hydraulic parameters were estimated. The hydrologic parameters include groundwater recharge and evapotranspiration rates. The hydraulic parameters include:

- Horizontal hydraulic conductivity distribution
- Vertical anisotropy ratio
- Conductance of rivers and streams
- Conductance of general head boundaries
- Specific yield and storativity

The quasi-steady state calibration focused on calibration of the hydraulic parameters throughout the entire model domain. Initially, the quasi-steady state calibration also served as a data gap identification process. The result of the quasi-steady state calibration was used as the initial condition for the transient calibration.

The five-year transient calibration used water level data collected since the start of the FNOP containment system and focused on the plume area, an area of approximately 40 square miles. The transient calibration process further improved the understanding of the hydrogeologic conditions near the FNOP containment system. The hydraulic conductivity distribution in the area of the FNOP extraction wells was verified and further improved through the iterative

transient and steady state calibrations. The calibration process also estimated the specific yield and storativity, and improved the estimation of the stream-aquifer interactions. The five-year transient calibration results can be used to support the proposed containment evaluation.

The shutdown test transient calibration used data collected during a 3-day system shutdown in December 2006 and focused on the hydraulic properties near EW-4, EW-6, EW-9, and EW-12. The transducer data at the newly installed (November/December 2006) observation wells at extraction wells EW-4, EW-6, and EW-9 were used as the calibration targets.

History matching of the plume migration, which included particle tracking using MODPATH and MT3DMS (Section 6), was also incorporated in the iterative model calibration.

5.2 QUASI-STEADY STATE CALIBRATION

The groundwater flow conditions in March 2006 are assumed to be quasi-steady state conditions. As discussed in Section 2.10, the aquifers in the study area are heavily stressed by pumping of public water supply wells, the FNOP containment system, and irrigation wells. Prior to each irrigation season, the groundwater system might not completely reach a steady state condition. In addition, the variations in public water supply pumping, the changes in river stages and creek stages, and the continuous over-stressing of the aquifer by the containment system may not allow the groundwater system to reach stable conditions. Thus the quasi-steady state calibration is recognized as only an approximation of steady state flow for the purpose of calibration.

5.2.1 Quasi-Steady State Calibration Procedure

Steady state model calibration is an iterative procedure that involves adjusting model parameters within a reasonable range to yield an acceptable match between the model output and the observed data. This methodology includes:

- Simulating the general pattern of the interpreted potentiometric surface, approximating the hydraulic gradients, and minimizing the residuals between the simulated and the observed hydraulic heads at observation wells.
- Simulating the stream-aquifer interaction through the selected sections that reasonably match the estimated fluxes based on available information;
- Achieving the match of head and fluxes, while maintaining the aquifer hydraulic parameters consistent with the aquifer test results, the hydrogeologic investigation results (Section 2.11.1), and related literature.
- Minimizing spatial variation of hydraulic conductivity while maintaining a reasonable match with the observed hydraulic heads and gradients;
- Identifying data gaps and data conflicts.
- Sensitivity analysis to assist estimation of river conductance and general head boundary conductance in the area where data are sparse.

Parameter adjustment involved a combination of two processes: (1) applying MODAC to estimate the general pattern of hydraulic conductivity distribution, and (2) applying hydrogeologic professional judgment to evaluate and modify the estimated parameters.

MODAC is a systematic parameter estimation tool for steady state calibration, based on concepts consistent with Darcy's law. If the uncertainties associated with model construction, the interpreted potentiometric surface, and other input parameters can be controlled with adequate prior information, MODAC is capable of giving a reasonable estimation of hydraulic conductivity distribution. The concept and application cases of MODAC are discussed in Guo and Zhang (2000 and 2004).

5.2.2 Quasi-Steady State Calibration Targets

The quasi-steady state calibration targets include:

- The observed groundwater levels on March 29, 2006 at 137 observation wells, monitoring wells, and the LPNNRD Wann basin wells (**Table 5-1**).
- The interpreted potentiometric surface (**Figure 2-4**) based on the observations on March 29, 2006 at observation wells, monitoring wells, Wann basin wells; and at USGS wells in the outlying areas (measured February-May, 2005).
- Estimate of fluxes at various river sections and stream sections based on observed river/stream stages and historical estimates of stream-aquifer interaction fluxes (Section 2.4).

5.2.3 Specified Conditions for Quasi-Steady State Calibration

Stresses and boundary conditions are specified for the quasi-steady state calibration, including river stage, stream stage, groundwater recharge, evaporation, and groundwater extractions.

5.2.3.1 River and Stream Stage

The river stage and bottom elevations along the Platte River, the Elkhorn River, and Wahoo Creek are specified using linear interpolation between river stages measured on March 29, 2006 (**Table 2-2, Figure 2-4**).

5.2.3.2 Groundwater Recharge and Evapotranspiration

The groundwater recharge rate is assumed to be 3.5 inches/year, or 0.0008 ft/day over the entire model domain. The selection of the lower end of the 3.5 to 4.3 inch/year range from Szilagyi et al. (2003) is based on the relatively low daily precipitation (**Tables 2-6** and **2-7**) in the month prior to March 29, 2006.

The depth to groundwater is shallow in the Platte Valley, varying from less than one foot to a few feet, thus evapotranspiration was applied in those areas in the calibration. Through iterative steady state and transient calibrations, groundwater ET rates were estimated as 0.036 inches/day (13.1 inches/year) for the Platte Valley and 0.012 inches/day (4.4 inches/year) for the Wahoo Valley for the steady state calibration. The extinction depth is assumed to be 6 ft bgs (Bouwer, 1978).

5.2.3.3 Groundwater Extractions

Groundwater extractions for the quasi-steady state calibration of March 2006 are simulated for the LWS, Ashland, Memphis, Ithaca, and Mead municipal supply wells; and for the FNOP containment system, as shown on **Figures 4-4** and **4-5**. The simulated pumping rates are presented in **Table 5-2**.

The LWS pumping is simulated at the non-summer pumping rate of 2006 with a total pumping rate of 25,000 gpm (36 MGD, or 55.7 cfs) at 39 wells. The municipal water supply extractions are simulated at Ashland (173 gpm), Memphis (8 gpm), Ithaca (12 gpm), and Mead (44 gpm). These pumping rates are based on a 100 gpm per capita consumption (NNRC, 1998) and 2005 population estimates (NDNR, 2006c). All wells are assumed to be screened in both Layers 2 and 3.

The FNOP extraction wells EW-1 through EW-10 and EW-12 are simulated as having a total pumping rate of 2,580 gpm (5.75 cfs) in accordance with their monthly average pumping rates in March 2006 (Section 2.10.3). Wells EW-11 and EW-13 are not currently operating. As shown on **Figure 1-2**, EW-1 is located in the Platte Valley, EW-2 is located at the valley wall; and EW-3 through EW-7, EW-9 and EW-10 are located in Todd Valley. EW-8 and EW-11 are located in Todd Valley near the TCE Plume LL1. EW-12 and EW-13 are located at the northern edge of the Wahoo Valley. EW-1 through EW-10 are simulated in both Layers 2 and 3. EW-12 is simulated only in Layer 3 as the saturated thickness under pumping is only about 20 ft above the bottom of the aquifer where the initial saturated thickness is about 80 ft.

5.2.4 Quasi-Steady State Calibration Results

5.2.4.1 Comparison to Observed Hydraulic Heads and Interpreted Potentiometric Surface

A total of 137 water level measurements, including USACE monitoring wells, USACE observation wells, and LPNNRD Wann Basin wells, are used as the direct calibration targets. The measurements at the USACE monitoring wells and observation wells are considered to be accurate because their casings were surveyed to ±0.01 foot. The wells in the LWS Ashland well field were also surveyed. But the estimated measurement datums on the Wann Basin observation wells may have some uncertainty since they were estimated from the NED 10-meter DEM. The USGS observations, which were measured in March 2005 (at the time of interpretation, data of March 2006 were not available yet and the difference between 2005 and 2006 were found to be small) and whose datums were also estimated from the 10-meter DEM, were used to support the interpretation of the potentiometric surface, but not directly used for comparison. The USGS wells, however, are generally located in the margins of the model, whereas the USACE wells are located in the plume areas, and the LPNNRD wells are located east of the plumes in the Platte Valley (**Figure 2-4**).

Comparisons of simulated and observed hydraulic heads are presented in **Table 5-2** and graphed on **Figure 5.2-1**. The matches between the observations and simulated heads at monitoring wells and observation wells are generally good. A quantitative measure of how well a model is calibrated is defined as the standard deviation of the root mean square error divided by the range of hydraulic head within the model domain. This measure is equal to 0.6% for the complete set of calibration data in this current model. This indicates a much better calibration than is typically achieved in groundwater modeling projects, because the commonly acceptable range is 10 to 15% (Groundwater Vistas, 2002). Moreover, this measure is less than the 1.9% for RDGM IV. However, this is not the only criterion for evaluating the calibration results (Section 5.2.1). Given the complexity of the system and the uncertainties of the data, the quasi-steady state calibration results are considered only one part of model calibration.

The simulated potentiometric surface of Layer 1 is presented on **Figure 5.2-2**. There are no potentiometric measurements in the silt/clay overbank deposits, thus comparison is not possible.

The simulated water table in Layer 1 is only shown in the Platte Valley and part of the Wahoo Valley. Large areas of Layer 1 are dry, which is reasonable because Layer 1 in Todd Valley, the till uplands, and most of Wahoo Valley is under unsaturated conditions.

A comparison of the simulated potentiometric surface of Layers 2 and 3 and the interpreted potentiometric surface in the entire model domain is presented on **Figure 5.2-3**. The general patterns of the two potentiometric surfaces are the same.

Simulated and interpreted potentiometric surfaces in the plume area, the area with the greatest number and most accurate water level measurements, are presented on **Figure 5.2-4**. The simulated residuals at observations wells (residual = observed head – simulated head) are posted on the figure. Most of residuals are less than +/- 0.5 ft; therefore the calibration in the plume area is considered good.

5.2.4.2 Model Water Budget

A model-simulated water budget provides a "big picture" of allocation of flow rates within the simulated hydrogeologic system. Even though there are no individual direct measurements of each water budget component with which to compare, the simulated water budget can be evaluated as to whether it is reasonable in comparison with the conceptual model.

The simulated model water budget is presented in **Table 5-3**. The water budget is based on the MODFLOW simulation results and may be considered to be the long-term average water budget. MODFLOW calculates the simulated flow into and out of the river cells, into and out of the general head boundaries, recharge into each layer, and discharge through the wells and drains. This model water budget suggests that the major sources of water for the aquifers are the Platte River (79 cfs) and the areal groundwater recharge (41 cfs).

In the section near the LWS Ashland collector wells, the simulated flux lost by the Platte River is 50 cfs, which is 89% of the total simulated pumping from the Ashland well field (56 cfs). Even though the LWS pumping extracts a significant volume of groundwater from the aquifer, the majority of the water is actually coming from the river. Thus, the cone of depression is generally limited to the boundaries of the well field (**Figure 5.2-3**).

The simulated lateral fluxes through the model boundaries (northern and southern general head boundaries) are relatively small compared to other fluxes. This is especially the case for the southern general head boundary.

The major discharge of groundwater is through groundwater extractions (62 cfs). Groundwater discharge through evapotranspiration (28 cfs) and discharges to surface water bodies (rivers, streams, and drains) as base flow (23 cfs) are also substantial.

5.2.4.3 Simulated Stream-Aquifer Interaction Fluxes

There are no available direct measurements of the fluxes between the aquifers and the rivers/creeks. The measured stream flow rates (Sections 2.4 and 2.5) at a limited number of locations are used as the reference for model calibration. The simulated interaction fluxes are presented in **Table 5-4** and the associated locations are presented on **Figure 5.2-5**.

The simulated groundwater flux discharged to the drain titles is 1.6 cfs in Section 34 at Johnson Creek and 3.3 cfs in Section 13 near Clear Creek. These rates are reasonable when compared to

the flow rate measured by the USGS from an outlet draining a tiled field on Johnson Creek in 1992 (0.51 cfs, Section 2.5), which represents one-fourth to one-half the flow to Johnson Creek.

The simulation of Johnson Creek, which flows through the AMA TCE plume, does not begin to gain groundwater until it flows into the Platte Valley. Drain cells are simulated along the upstream portion in Todd Valley (**Figure 5.2-5**), but the simulated drain flow is zero, which is consistent with observations that the creek is dry between the NRD reservoir and where it enters the Platte Valley. The simulated base flow rate of Johnson Creek at the USGS Memphis gauge (**Figure 5.2-5**) is 0.9 cfs. The measured flow rate at SW-8 (near MW-45 and the USGS gauge) on April 21, 2006 was 0.9 cfs (Section 2.4.4). The reported flow rate at the USGS Memphis gauge is 1.0 cfs in March 2006. The total simulated gaining rate of Johnson Creek before joining Clear Creek is 1.4 cfs.

The simulated gaining rate of Clear Creek upstream of the confluence with Johnson Creek is 0.7 cfs. Assuming 70% of the agriculture drainage (3.3 cfs) in Section 13 (**Figure 5.2-5**) flows into Clear Creek, the simulated base flow in Clear Creek would be 3.0 cfs, which appears comparable with the USGS flow measurements in July 1990 through October 1992 (Section 2.4.3). The simulated total base flow rate immediately downstream of the confluence of Johnson Creek and Clear Creek is 5.5 cfs, which is a summation of the flow from the two drain tile areas (70% of 4.9 cfs), Clear Creek flow from upstream (0.7 cfs), and the flow from Johnson Creek (1.4 cfs). This rate is similar to the USGS measurement (6.1 cfs) on October 28, 1992 (Section 2.4.3), but higher than the other three measurements in 1990 and 1991 (1.9 to 3.0 cfs) measured in summer time (July, August, September).

The simulated gaining rate for Wahoo Creek from Ithaca to Ashland is 7 cfs. Including the input flow rate of 2.4 cfs from Silver Creek, the total base flow rate between Ithaca and Ashland is 9.4 cfs. The Wahoo Creek gauge at Ashland is located downstream of the Clear Creek confluence, which adds another 6 cfs for a total base flow of 15 cfs. The difference in the USGS measured rates at Ithaca (USGS 06804000) and Ashland (USGS 06804800) in March 2006 was approximately 10 cfs (USGS, 2006b). The average difference between Ithaca and Ashland for the minimum flow conditions (Section 2.4.5) is 15 cfs. Wahoo Creek may also receive groundwater discharge from the till uplands in the southwestern part of model domain, which is not simulated in the model.

The simulated gaining rate for Silver Creek within the model domain is 2.4 cfs, somewhat comparable to the rates discussed in Section 2.4.6. The simulated gaining rate between gauge 2 and gauge 1 (12 gpm) is only 8% of the simulated rate between gauge 3 and gauge 2 (157 gpm), even though both sections have the similar lengths. This is the result of groundwater extraction simulated at EW-12.

5.2.4.4 Simulated MUD Pumping

In the vicinity of the MUD Platte West well field, there are fewer water level measurements compared to other areas, and the available data are static data. In more permeable portions of the aquifer such as near the MUD well field, the aquifer responses to heavy pumping stresses usually provide more valuable information about the aquifer hydraulic characteristics than the static condition. However, in March 2006 there was no pumping in this area. Data reflecting the relationship of stress and response will only be available when the MUD extraction is started and the drawdown is measured. To improve the estimation of the riverbed conductance of Platte

River and the general head boundary conductance and to verify the hydraulic conductivity estimation in the vicinity, the proposed MUD pumping was simulated and a sensitivity analysis was conducted during the simulation.

The maximum permitted annual average pumping rate of 52 MGD is simulated in accordance with the rates in **Table 2-8**. The sensitivity test results suggest that the riverbed conductance is much more sensitive than the conductance of the general head boundary along the northern model boundary. The calibrated river conductance is discussed in Section 5.6.3.1.

5.3 QUASI-STEADY STATE VERIFICATION

The observed hydraulic heads on October 30, 2006 (**Tables 2-3** and **2-5**) were used to verify the quasi-steady state calibration. Water levels measured on October 30, 2006 from 154 monitoring wells were compared to the simulated hydraulic heads for March 29, 2006 (**Table 5-5** and **Figure 5.2-6**). The number of wells for comparison increases from 137 wells to 154 wells and the October data cover a larger area than the March data. The statistics of residuals are similar to the calibration results. The results are better than could typically be expected in modeling. The standard deviation of residuals over the head change within the model domain is 0.6%, the same as for the calibration (Section 5.2.4.1). If the groundwater recharge is further reduced by 6%, which may be reasonable for October, the mean of the residuals could further be reduced from 0.48 to zero.

The results indicate that:

- The groundwater levels between March and October of 2006 are very similar, which is also demonstrated in the interpretations of the two water tables (**Figure 2-5**).
- The quasi-steady state calibration using data from March of 2006 is verified very well by the data of October 2006.
- The calibrated quasi-steady state model may be used to represent the non-irrigation season groundwater flow conditions.

5.4 FIVE-YEAR TRANSIENT CALIBRATION

The FNOP containment system, EW-1 through EW-10, began operation in February 2002. EW-12 started pumping in February 2006. Since pumping started, groundwater monitoring has been conducted in the plume area, especially near the extraction wells. These data provide excellent opportunities for better understanding of the hydrogeologic conditions. The five years of pumping can be considered to be a long-term large-scale "pumping test", and the five-year transient calibration is an effort to simulate this "pumping test". The calibration verified the hydraulic conductivity distribution not only in the vicinity of the pumping wells, but also in the larger area where pumping has an influence. The relative drawdown hydrographs for different periods at 47 MW or OW wells are used as the targets for the transient calibration.

5.4.1 Simulation Periods

The five-year transient calibration covers a period of almost five years, starting on February 22, 2002 and ending on December 12, 2006, the day prior to the shutdown test. The entire period includes 22 stress periods, each of which is typically three months. The beginning dates of stress Period 1 (when EW-1 through EW-10 began pumping on February 22, 2002), and stress period 18

(when EW-12 began pumping on February 13, 2006) were adjusted to begin on those dates. Period 21 includes two months and ends on October 30, 2006 for the purpose of comparing the simulated and the measured groundwater elevations on that date. Period 22 ends after 43 days to simulate the initial conditions for the shutdown test calibration (Section 5.4). The shutdown test was conducted from December 13, 2006 to December 15, 2006. Each stress period includes 10 time steps, with a multiplier of 1.2.

Stress Period	Period	Duration (day)	Elapsed Time (day)	Remark
	2/21/2002	0	0	Prior to pumping
1	2/22/2002 - 2/28/2002	7	7	Pumping started at EW-1 to EW-10
2	3/01/2002 - 5/31/2002	92	99	
3	6/01/2002 - 8/31/2002	92	191	Irrigation pumping for 3 months
4	9/01/2002 - 11/30/2002	91	282	
5	12/01/2002 - 2/28/2003	90	372	
6	3/01/2003 - 5/31/2003	92	464	
7	6/01/2003 - 8/31/2003	92	556	Irrigation pumping for 3 months
8	9/01/2003 - 11/30/2003	91	647	
9	12/01/2003 - 2/29/2004	91	738	
10	3/01/2004 - 5/31/2004	92	830	
11	6/01/2004 - 8/31/2004	92	922	Irrigation pumping for 3 months
12	9/01/2004 - 11/30/2004	91	1013	
13	12/01/2004 - 2/28/2005	90	1103	
14	3/1/2005 - 5/31/2005	92	1195	
15	6/01/2005 - 8/31/2005	92	1287	Irrigation pumping for 3 months
16	9/01/2005 - 11/30/2005	91	1378	
17	12/01/2005 - 2/12/2006	74	1452	
18	2/13/2006- 2/28/2006	16	1468	Pumping started at EW-12
19	3/01/2006 - 5/31/2006	92	1560	
20	6/01/2006 - 8/31/2006	92	1652	Irrigation pumping for 3 months
21	9/01/2006 - 10/30/2006	60	1712	Site-wide water level measurements on 10/30/2006
22	10/31/2006 - 12/12/2006	43	1755	12/12/2006 is the day prior to shutdown test

5.4.2 Specified Conditions for Transient Calibration

Boundary Conditions. The boundary conditions in the transient calibration are specified to be the same as in the steady state condition, because (1) most of the boundaries, including rivers and streams, are far from the FNOP extraction wells, and (2) the seasonal variations of the surface water stages are limited to a couple of feet (USGS, 2006b). Although Johnson Creek is in the area of the FNOP extraction wells, the stage is assumed to be steady because the stage only fluctuates within one foot most of time (USGS, 2006b).

Initial Conditions. The steady state calibration was re-run by removing the FNOP pumping. The resulting hydraulic head distribution is assumed to represent the initial head for the transient simulation. In order to minimize the difference of the simulated groundwater recharge and evapotranspiration between the steady state model and the transient model, the transient model

was run without the FNOP pumping for five years. The resulting hydraulic head distribution at the end of stress period 17 (February 12, 2006), was used as the initial head for the transient calibration starting in February 2002.

Stresses. The major differences in transient model input compared to the quasi-steady state stresses include:

- Seasonal pumping rates at the LWS Ashland well field
- Variable FNOP pumping rates
- Irrigation pumping rates
- Seasonal groundwater recharge
- Seasonal groundwater evapotranspiration

5.4.2.1 Groundwater Extractions

LWS Ashland Well Field Pumping Rates

The LWS Ashland well field monthly pumping rates from January 2002 to August 2006 are presented in **Table 5-6**. The quarterly average pumping rate, ranging from 44 cfs to 105 cfs, was based on the monthly data, and was used as input for the transient calibration. The pumping is distributed to 39 pumping wells in the same proportions as the pumping rate distribution in **Table 2-6**. The rates for the fall and winter of 2006 were assumed to be the same as for the fall and winter of 2005, since data were only available through August 2006.

FNOP Containment System Pumping Rates

Based on the pumping rates of the FNOP wells (ECC, 2007), the pumping rates at the 12 extraction wells were averaged to quarterly rates (**Table 5-7**) and used as input for the 22 stress periods in the transient calibration.

Estimated Irrigation Pumping Rates

Of 339 active registered irrigation wells (Section 2.10.2) located within the model domain, 278 wells are assumed to be pumping based on the assumption that only one well per quarter section is pumping. Evaluation of drawdown hydrographs suggests that the irrigation season lasts approximately three months. In the model, the irrigation pumping is applied in June, July, and August. The estimated transient irrigation rates are presented in **Table 2-11**, and the same rates are used for every irrigation season.

5.4.2.2 Groundwater Evapotranspiration and Recharge

According to Szilagyi et al. (2003), the long-term mean annual base groundwater recharge in the study area ranges from 3.5 to 4.3 inches/year, and the long-term mean total recharge ranges from 3.9 to 5.9 inches/year (Szilagyi et al. 2005). Base recharge as defined by Szilagyi et al. (2005) is the total recharge minus the amount of any potential losses from groundwater storage other than discharge to streams. One such loss term is evapotranspiration from groundwater.

The estimated long-term mean annual base recharge in Figure 11 from Szilagyi, et al. (2003) is 3.5 to 4.3 inches/year. The estimated long-term mean annual total recharge rate in Figure 11 from Szilagyi, et al. (2005) is 3.9 to 5.9 inches/year. The difference between the total recharge and the base recharge can be considered to be the areal effective groundwater ET, which is 0.4 to 1.6 inches/year. This is the effective groundwater ET for the entire region, including areas in which groundwater ET is occurring (e.g., the Platte Valley and the Wahoo Valley) and areas in which ET is not occurring (e.g., Todd Valley and the till uplands).

The long-term annual mean potential evapotranspiration (PET) recorded at the Omaha airport from 1948 to 2006 is 44 inches/year (MRCC, 2007). The long-term monthly mean PET is shown on **Figure 5.3-1**. Szilagyi et al. (2003) estimated that the long-term mean annual ET in southeastern Saunders County is approximately 24 inches. The estimated long-term mean annual groundwater ET from phreatophytes and from wetlands in southeastern Saunders County is 29 inches/yr (Szilagyi et al. 2005).

The seasonal groundwater recharge and ET in the model were estimated based on the regional information, the meteorological data, and the observed groundwater level fluctuations. **Figure 5.3-2** displays seven hydrographs in the Platte Valley. Three conditions can be observed in the figure: (1) the depths to water from ground surface are all shallow, (2) groundwater levels fluctuate with the same seasonal pattern, and (3) the long-term average water levels during 2002 to 2006 did not change with time. The depths to water from ground surface at MW-36A, MW-38A, MW-45A, and MW-46A range from one foot to six feet. These wells are located in an area of one square mile (**Figure 2-1** or **2-2**). Some are near irrigation wells, but some are not. OW-13, OW-14, and OW-15 are located at EW-1 and should be strongly influenced by the pumping at EW-1. However, the water levels at these wells do not appear to be influenced by EW-1, rather they have the same pattern as the monitoring wells, except their depths to water are slightly greater, which is caused by EW-1 pumping. Through the sensitivity analyses performed during transient calibration, it was found that the fluctuations of the water levels in the Platte Valley are caused mainly by groundwater evapotranspiration and irrigation pumping. The continuous water supply from the Platte River and the saturated fine alluvium provide ideal conditions for the occurrence of groundwater evapotranspiration.

A weak seasonal pattern can be observed at wells near EW-12 (**Figure 5.3-3**) in the Wahoo Valley, where there is no irrigation pumping. The depths to water at these wells ranged from 6 to 11 ft prior to the beginning of pumping at EW-12. The depth to water increased after pumping began, but during April, May, and June the drawdowns decreased, indicating the effect of groundwater recharge or seasonal stream discharge to the aquifer in the Wahoo Valley.

These observations suggest that seasonal groundwater recharge and ET should be applied in the transient calibration. The seasonal groundwater recharge rates are estimated proportionally based on the monthly precipitation rates (**Tables 2-6** and **2-7**) and adjusted during calibration. The annual average recharge over the five-year period is estimated at 3.6 inches/year for the Todd Valley and the Wahoo Valley and 5.4 inches/year for the Platte Valley. The general temporal distribution of recharge for winter, spring, summer, and fall is set at 18%, 32%, 32%, and 18%. The simulated annual groundwater ET of 8.8 inches/year is applied to the entire Platte Valley and the Todd Valley, and 4.4 inches/year of groundwater ET is applied to the Wahoo Valley. The extinction depth to groundwater evapotranspiration was set at 6 feet according to the literature (Bouwer, 1978). In reality, the extinction depth may be deeper in the Platte Valley and Wahoo Valley because of the fine grained materials of the top layer. As the depths to water

in the Todd Valley are much deeper, about 20 ft bgs, groundwater ET is not applicable in the Todd Valley.

The groundwater ET should vary with location based on the variable distribution of vegetation and water supply. It is expected that the groundwater ET along the Platte River is the highest due to dense vegetation and sufficient water supply. However, for the purpose of conservativeness to evaluate the potential impact of MUD pumping, the calibrated groundwater ET values in the EW-1 area and in the EW-12 area, which are representative of the areas of interest, were used in the entire Platte Valley and Wahoo Valley.

The simulated effective volume of groundwater ET over the five-year period for the entire model domain is 39% of the simulated volume of recharge during the same time period. The simulated recharge rate is 3.6 inches/year for the Todd Valley and the Wahoo Valley and 5.4 inches/year for the Platte Valley, and can be considered to be the total recharge. The simulated average effective aerial groundwater ET, thus, is approximately 1.7 inches/year over the entire model domain, assuming the average total recharge rate is 4.5 inches/year. This rate is close to the estimated range (0.4 to 1.6 inches/year) of the difference between the total recharge and the base recharge by Szilagyi, et al. (2005).

5.4.3 Transient Calibration Results

The simulated and observed drawdowns are compared at:

1. 31 wells from February 2002 to December 2006, and
2. 16 wells near EW-12 from February 2006 to December 2006.

The relative drawdowns of both simulated and observed levels were calculated by subtracting the depth to water prior to pumping.

5.4.3.1 Comparison of Drawdowns from 2002 to 2006

Comparisons are presented in groups in the vicinity of EW-1, EW-3, EW-5, EW-7, EW-8, EW-10, and part of the upgradient portion of the plumes.

Drawdowns near EW-3, EW-5, EW-7, and EW-10 in the Todd Valley

EW-3 Area

Figure 5.3-4 shows the comparisons at wells in the vicinity of EW-3, including OW-27, OW-28, and OW-30. The initial saturated thickness at EW-3 is 48 ft. The pumping rate at EW-3 is around 220 gpm, ranging from 215 to 249 gpm. The estimated hydraulic conductivity is 356 ft/day from analytical methods (i.e., pumping test analysis) and 350 ft/day from the model parameter estimation process (i.e., MODAC). The simulated drawdowns are approximately one foot less than the observed drawdowns. The well-matched hydraulic heads in nearby observation wells in the steady state calibration (**Figure 5.2-4**), and the consistency between the model-estimated and the pumping test-estimated K values do not suggest that the hydraulic conductivity should be further reduced. The transient calibration is also affected by other parameters, such as recharge and storativity, which are assumed to be constant for the Todd Valley (a standard practice in modeling), as well as the estimated average irrigation pumping rate (which is actually variable year to year). Therefore, further adjustment of parameters to improve the match of the drawdown curve was not warranted. The cumulative drawdowns are 6 to 7 feet over this period,

which may be attributed to the regional water table decline of the Todd Valley and the pumping at EW-3. The rates of drawdown in both observed and simulated curves have been decreasing over time and appear to approach a stabilized condition.

EW-5 Area

Figure 5.3-5 shows the comparisons at wells in the vicinity of EW-5, including OW-34, OW-35, OW-36, and OW-37. The initial saturated thickness at EW-5 is 55 ft. The pumping rate is approximately 240 gpm, ranging from 180 to 250 gpm. The estimated hydraulic conductivity is 189 ft/day from the pumping test analysis and 200 ft/day from the model parameter estimation process. The simulated curves match the observed curves very well. The cumulative drawdowns are 10 to 11 ft over this period. The rates of drawdown have been decreasing and approaching a stabilized condition.

EW-7 Area

Figure 5.3-6 shows the comparisons at wells in the vicinity of EW-7, including OW-41, OW-42, OW-43, and OW-44. The initial saturated thickness at EW-7 is 45 ft. The pumping rate is approximately 300 gpm, ranging from 265 to 330 gpm. The estimated hydraulic conductivity is 155 ft/day from analytical methods and 140 ft/day from the model parameter estimation process. The simulated curves match the observed curves very well. The cumulative drawdowns are 10 to 16 ft over this period. The rates of drawdown decrease over time and approach a stabilized condition.

EW-10 Area

Figure 5.3-7 shows the comparisons at wells in the vicinity of EW-10, including OW-48, OW-49, OW-50, and OW-51. The initial saturated thickness at EW-10 is 72 ft. The pumping rate is approximately 380 gpm, ranging from 280 to 430 gpm. The estimated hydraulic conductivity is 123 ft/day and 160 ft/day by the model. The simulated curves match the observed data very well. The cumulative drawdowns over this period are 10 to 12 ft. The rates of drawdown decrease over time and approach a stabilized condition.

In general, the simulated hydrographs match the observed hydrographs well in the Todd Valley, indicating the model calibration in this area is reasonable.

Drawdowns near EW-8 and in LL1 Plume Area

LL1 Area

The comparisons between the observed and simulated drawdowns in the LL1 plume area are shown on **Figure 5.3-8,** including MW-03A, MW-17B, MW-21A, MW-24A, and MW-25A. Due to the large distance from the FNOP extraction wells, the water levels at these wells appear less affected or not affected at all by the FNOP pumping. During 2002 to 2006, the drawdowns at these wells have increased by 4 ft, except for MW-17B where drawdown has increased 2.5 ft. Such increasing trends of drawdown are also observed at the USGS monitoring wells 13 N 9E 5ABAA1, 13N 9E 16BAA1, 14N 8E 2ADDA1, 14N 8E 24ACD2 MEAD, 14N 8E 14CC-1, 14N 9E 20DD1, 14N 9E 32DD1 (USGS, 2006) in the Todd Valley. The decline of the water table during 2002 to 2006 may be due to the decrease of groundwater recharge as the results of decreased precipitation during the period (93% of normal (MRCC, 2006)). The seasonal patterns of drawdown appear to be influenced by irrigation pumping. At MW-03A and MW-25A, the model simulation results closely match the annual cycle and the increasing trending. The

simulated drawdown at MW-21A is strongly influenced by irrigation pumping, which is different from the observed water level measurements. This may be because the simulated irrigation pumping at well G-054656 (also known as ARDC irrigation well 10A) at an average seasonal rate of 184 gpm is higher than the actual pumping rate. The observed drawdowns at MW-17B also show a different pattern than the simulated pattern. This suggests that MW-17B may be more influenced by stream flow in the Wahoo Valley.

EW-8 Area

Figure 5.3-9 shows the comparisons at wells in the vicinity of EW-8, including OW-17, OW-18, OW-19, and OW-23. The initial saturated thickness at EW-8 is 109 ft. The pumping rate is around 300 gpm, ranging from 300 to 340 gpm. The estimated hydraulic conductivity is 93 ft/day from the pumping test analysis and 100 ft/day from the model parameter estimation process. The seasonal fluctuation in the observed hydrographs appear more pronounced than those near EW-3, -5, -7, and -10, which are all located in the Todd Valley. This may suggest that even though EW-8 is located in the Todd Valley, it may be influenced by stream flow in the Wahoo Valley. Such seasonal fluctuations are observed at MW-17 and the EW-12 area. The topographic map (**Figure 1-2**) shows that EW-8 is located at the end of a small tributary that directly discharges to Wahoo Creek.

Drawdowns near EW-1 in the Platte Valley

EW-1 is located next to Johnson Creek in the Platte Valley. **Figure 5.3-10** shows the comparison of the simulated and observed drawdowns at OW-13, OW-14, OW-15, and MW-36A, MW-38A, MW-44A, MW-45A, and MW-46A. The initial saturated thickness at EW-1 is 19 ft. The pumping rate is approximately 180 gpm, ranging from 150 to 230 gpm. The estimated hydraulic conductivity is 389 ft/day from the pumping test analysis and 400 ft/day from the model parameter estimation process. The drawdowns at OW-13, OW-14, and OW-15 due to extraction of EW-1 are only about 1 to 2 ft. The fluctuations of the drawdowns at the OW wells have the same patterns as that of the MW wells that are not expected to be influenced by EW-1. In contrast to drawdowns in the Todd Valley, the drawdowns at these wells in the Platte Valley have a strong seasonal pattern but do not increase over time.

The simulated and observed hydrographs are matched reasonably, even though not as well as the match of the drawdowns in the Todd Valley. Evapotranspiration is a complex and highly variable process, and thus exactly simulating this process is not possible and is not necessary to meet the modeling objectives. However, the calibration process improved the understanding of the hydrogeologic conditions in the vicinity of EW-1.

5.4.3.2 Comparison of Drawdowns near EW-12 from February to December 2006

EW-12 is located in the Wahoo Valley near Silver Creek, which is a transition zone between the Wahoo Valley and Todd Valley. Continuous pumping at EW-12 was started on February 13, 2006. The stress periods 18 through 22 (309 days) simulated this process. Transducer data (**Figure 5.3-11**) are available at 16 observation wells in the vicinity, including OW-51 through OW-59, MW-79A, MW-80A, MW-89A, MW-90A, MW-91A, MW-92A, and MW-93A. In general, the simulated drawdowns reasonably match the observed drawdowns, but not as well as for the Todd Valley wells. The hydrogeology near EW-12 is much more stratified than in the Todd Valley. The observed drawdowns at OW-52, OW-53, and OW-55 increased sharply at the beginning of pumping, indicating these locations may be initially under a confined condition.

The model did not simulate the change from confined to unconfined because the top layer becomes unsaturated during the steady state simulation of the EW-12 pumping (simulating the conditions of March 29, 2006, six weeks after pumping began). In addition, as indicated by the observed patterns of the drawdown hydrographs, the recovery of water levels during April and May of 2006 suggest the groundwater recharge has a strong impact on groundwater levels in the Wahoo Valley, similar to the Platte Valley.

5.5 SHUTDOWN TEST CALIBRATION

The shutdown test was conducted for 72 hours in December 2006 for the purpose of collecting additional data to verify the hydraulic conductivity conditions in selected extraction wells, especially near EW-4, EW-6, and EW-9, where new observation wells were installed in 2006. The entire extraction system was shutdown, including EW-12, from 4:00 p.m. December 12, 2006 to 4:00 p.m. on December 15, 2006. Prior to the shutdown, the water levels were measured at all the observation and monitoring wells within half a mile of the extraction wells on December 11 and 12, 2006. After the system was turned on at 4:00 p.m. on December 15, the transducers continuously collected water levels for three days until December 18, 2006.

Transducer data were collected at newly installed observations wells near EW-4, EW-6, and EW-9, as well as at the observations wells near EW-12. This shutdown test is similar to a large-scale pumping test, while the process is the opposite, recovering first and pumping later. The shutdown test results were analyzed using distance drawdown analysis (Section 2.11.1.1). The data were also used in the numerical model to verify the hydraulic conductivities in the vicinity of EW-4, EW-6, EW-9, and EW-12.

5.5.1 Simulation Periods

The shutdown test was simulated for two stress periods as indicated below. Each period includes 15 or 10 time steps with a multiplier of 1.5. The simulated water levels on December 12, 2006 in the five-year transient calibration were used as the initial condition for the shutdown test simulation.

Stress Period	Period	Duration (day)	Elapsed Time (day)	Time Steps	Remark
	12/12/2006	0	0		Prior to shutdown
1	12/13/2006 - 12/15/2006	3	3	15	System shutdown
2	12/16/2006 - 12/18/2006	3	6	10	System turn on

5.5.2 Specified Conditions for Shutdown Test Calibration

The boundary conditions are assumed to be steady state, for the same reasons as for the five-year transient calibration (Section 5.4.2): most of the boundaries are far from the FNOP containment system, and the seasonal variations of the surface water stages are limited to a couple of feet. During this period, there is no irrigation pumping. The pumping at the LWS well field is assumed to be the same rate as for the winter of 2005. The miscellaneous municipal water supply pumping is assumed to be constant. The groundwater recharge rates and the groundwater evapotranspiration rates are assumed to be the same as the winter rates in the five-year transient calibration. Because the simulation period is short, these conditions have less effect on the model results.

The only changes of the input to the model include:

- The FNOP extraction well pumping rates
- The specific yield and storativity

	Stress Period	EW-1	EW-2	EW-3	EW-4	EW-5	EW-6	EW-7	EW-8	EW-9	EW-10	EW-12
Pumping Rate (gpm)	1	0	0	0	0	0	0	0	0	0	0	0
	2	220	162	306	112	183	292	361	296	130	295	325

As discussed by Marsily (1986), specific yield depends, in reality, on the length of time during which the soil is allowed to drain. At the beginning of groundwater extraction or recovery, the actual specific yield can be only a small percentage of the stabilized specific yield. In the shutdown simulation, the specific yield, therefore, was reduced to 0.05, 0.02, and 0.1 for Todd Valley, Wahoo Valley, and Platte Valley, respectively. The storativity was reduced to 0.001 for Wahoo Valley, and kept the same (0.01) for Todd Valley and Platte Valley.

5.5.3 Shutdown Test Calibration Results

The shutdown test results are compared to the observed relative drawdowns since 4:00 p.m. December 12, 2006 on **Figures 5.4-1** through **5.4-4**.

EW-4 Area

Figure 5.4-1 includes simulated and observed recovery and drawdown at OW-60 (located 60 ft from EW-4), OW-61 (201 ft from EW-4) and OW-62 (615 ft from EW-4). The simulated maximum recovery at OW-60 (60 ft from EW-4) is 0.9 ft while the observed recovery is 1.2 ft. The approximate saturated thickness at EW-4 is 43 ft without pumping. The pumping rate was 110 gpm prior to shutdown. The estimated hydraulic conductivity is 150 ft/day from the distance-drawdown analysis and 200 ft/day from the model parameter estimation process. The simulated recovery of the OW-60 water levels and OW-61 is slightly lower (0.25 ft) than actual. This suggests that the estimated hydraulic conductivity is in a reasonable range.

EW-6 Area

Figure 5.4-2 includes simulated and observed recovery and drawdown at OW-66 (located 63 ft from EW-6) and OW-67 (202 ft from EW-6). The simulated recovery and drawdown at OW-66 matches the observed measurements very well, but the simulated recovery/drawdown is greater than the observed measurements at OW-67. The estimated hydraulic conductivity is 280 ft/day from the distance-drawdown analysis and 200 ft/day from the model parameter estimation process. The approximate saturated thickness at EW-6 is 32 ft without pumping. The pumping rate was 262 gpm prior to shutdown. The overestimation of recovery at OW-67 (0.8 ft) may suggest that the hydraulic conductivity in the vicinity may be slightly lower than estimated.

EW-9 Area

Figure 5.4-3 includes simulated and observed recovery and drawdown at OW-72 (located 62 ft from EW-9) and OW-73 (201 ft from EW-9). The approximate saturated thickness at EW-9 is 43 ft without pumping. The pumping rate was 138 gpm prior to shutdown. The estimated hydraulic conductivity is 190 ft/day from the distance-drawdown analysis and 160 ft/day from

the model parameter estimation process. The reasonable match of the hydrographs suggests that the estimated hydraulic conductivity is in a reasonable range.

EW-12 Area

Figure 5.4-4 includes simulated and observed recovery and drawdown at eight wells, including TH-EW-12 (located 20 ft from EW-12), OW-52 (150 ft from EW-12), OW-53 (183 ft from EW-12), OW-54 (762 ft from EW-12), OW-58 (655 ft from EW-12), MW-89A (1,180 ft from EW-12), MW-92A (772 ft from EW-12), and MW-92B (766 ft from EW-12). The pumping rate was 325 gpm prior to shutdown. The estimated hydraulic conductivity (K) is 22 ft/day from the distance-drawdown analysis and 20 ft/day from the model parameter estimation process. The reasonable matches of the simulated and observed hydrographs at multiple wells with different amounts of recovery and drawdown suggest that the estimated K of 20 ft/day at or near EW-12 as well as the variation of K values in the vicinity is reasonable.

5.6 CALIBRATED HYDRAULIC PARAMETERS

Through the iterative process of steady state calibration, five-year transient calibration, shutdown transient calibration, and particle tracking for history matching of plume migration pathways (Section 6), the hydraulic parameters were calibrated and verified.

5.6.1 Calibrated Hydraulic Conductivity Distribution

The calibrated hydraulic conductivity of silt/clay overbank deposits of Layer 1 is 1 ft/day. Because there are no direct measurements of hydraulic heads in Layer 1, the calibration was based on the reasonableness of the simulated flow rates of the drain tiles (Section 5.2.4.3).

The calibrated hydraulic conductivity (K) distribution of the aquifers (which is the same for Layers 2 and 3) is presented on **Figure 5.5-1**. The estimated hydraulic conductivities vary from 20 ft/day to 500 ft/day for the entire model domain. The hydraulic conductivity in the Platte Valley is high, ranging from 240 ft/day to 500 ft/day, particularly along the Platte River, consistent with the heavy LWS pumping and the MUD pumping test results (Section 2.11.1.5). Near the valley wall around the confluence of Johnson and Clear creeks (partly in the Platte Valley and partly in the Todd Valley), the hydraulic conductivity is also high, around 500 ft/day, consistent with the pumping test results at EW-1 and EW-3 (Section 2.11.1.1). In the Todd Valley, hydraulic conductivity generally varies from 80 ft/day to 200 ft/day. In the Wahoo Valley, the hydraulic conductivity ranges from 120 ft/day to 150 ft/day, but can be up to 200 ft/day near the confluence of Wahoo Creek and Clear Creek. However, the excessive and widespread drawdowns measured in the observation and monitoring wells near EW-12 (located at the boundary of the Wahoo Valley aquifer and Todd Valley aquifer on **Figure 1-2**) result in an estimated hydraulic conductivity value as low as 20 ft/day, which is also consistent with the various field test results (Section 2.11.1.1).

The stratigraphy of the alternating fluvio-glacial deposits and tills in the uplands area is complex, and the amount of stratigraphic and hydraulic data is a small fraction of what is known about the other aquifers in the model area. The hydraulic conductivity estimated for the uplands aquifer is 70 ft/day, and should be considered a generalization of the properties of several disparate layers.

In the calibrated model, the vertical anisotropic ratio of horizontal versus vertical hydraulic conductivities is specified to be 10:1 for all layers.

5.6.2 Calibrated Storage Coefficient

The estimated specific yield and storativity from the five-year transient calibration are:

Aquifer	Specific Yield	Storativity
Platte Valley	0.25	0.01
Todd Valley	0.20	0.01
Wahoo Valley	0.25	0.01
Overbank Deposits	0.01	NA

These values are reasonable for sand and gravel alluvium (Freeze and Cherry, 1979) and are used in the calibrated model.

5.6.3 Calibrated Boundary Conductance

5.6.3.1 River Boundary Conductance

The river boundary conductance of the Platte River was estimated to range from 5,000 ft^2/day to 20,000 ft^2/day per river cell, where the river cell size varies from 100 ft by 400 ft to 400 ft by 400 ft. Given that the width of the river varies from four to seven model cells, the river conductance per 100-ft length ranges from 20,000 to 40,000 ft^2/day. The reasonableness of the conductance was assessed by simulating MUD pumping. When the MUD. Platte West well field begins operation in 2008, the stresses induced by pumping will aid in verification of the calibrated conductance values for the Platte River.

The estimated river conductance is also evaluated by comparing the equivalent vertical hydraulic conductivity of the riverbed with the literature values. The riverbed conductance can be calculated as:

$$CD = \frac{KWL}{M}$$

where

CD = river conductance (L^2/T)

K = riverbed vertical hydraulic conductivity (L^3/T)

W = width of river cell (L) (400 ft)

L = length of river cell (L) (200 – 400 ft)

M = riverbed thickness (L)

Using this equation, the equivalent vertical hydraulic conductivity of the riverbed ranges from 0.5 ft/day to 2 ft/day (1E-04 to 7E-04 cm/s) assuming M is equal to 10 to 15 ft, the estimated difference between the riverbed elevation and the top elevation of Layer 2. Assuming the ratio of horizontal versus vertical hydraulic conductivities is 10, the horizontal hydraulic conductivity may range from 5 ft/day to 20 ft/day. Both the estimated vertical and horizontal hydraulic conductivity of the riverbed sediment are lower than those reported in the literature. The estimated vertical hydraulic conductivity of the riverbed of the Platte River by Rus et al. (2001), Chen (2005), and TZA (1989) ranges from 20 ft/day to 60 ft/day. However, the sensitivity analysis of increasing the river conductance resulted in substantial overestimation of the

groundwater levels in the Platte Valley. Even though the estimated vertical hydraulic conductivity is lower than stated in the literature, the model-estimated average flux from the Platte River to the aquifer over the entire length within the model domain is 45 gpm per 100 ft.

The riverbed conductance of the Elkhorn River is assumed to be 2,000 ft^2/day per model cell, which is similar to or less than the conductance assumed for the Platte River. The river conductance for Wahoo Creek is generally 2,000 ft^2/day per model cell.

5.6.3.2 Stream Conductance

The estimated conductance for the drain cells used to simulate the streams varies from 25 ft^2/day to 600 ft^2/day for most of the cells. The conductance for Clear Creek varies from 25 ft^2/day to 1,000 ft^2/day. The conductance for Johnson Creek varies from 75 ft^2/day to 600 ft^2/day.

5.6.3.3 Drain Tile Conductance

The drain tile conductance is assumed to be 2,000 ft^2/day per model cell. The reasonably close comparison of the simulated drain flow rates (Section 5.2.4.3) to those actually observed in the field indicates that this assumption is acceptable. In the calculation of drain flow, the flow rate is limited by the hydraulic conductivity of Layer 1 instead of a specified drain conductance.

5.6.3.4 General Head Boundary Conductance

The general head boundary conductance was specified ranging from 500 ft^2/day to 3,000 ft^2/day. The sensitivity analysis during and after the calibration found the model results were not sensitive to this parameter.

5.7 SENSITIVITY ANALYSIS – STEADY STATE FLOW MODEL CALIBRATION

Based on the ASTM's "Standard Guide for Conducting a Sensitivity Analysis for a Ground-Water Flow Model Application" (ASTM, 1994), the purpose of a sensitivity analysis is to assess the adequacy of the model with respect to its intended function. In general, the sensitivity process identifies model inputs that are likely to affect calibration residuals and/or the model's conclusions based on the predictive simulations.

The model calibration process described in the previous sections is actually a continuous sensitivity analysis process to identify the input parameters that are sensitive to the reduction of the model calibration residuals. To quantify the effect of change in model parameters on the calibration results, systematic sensitivity was conducted and reported here. The analysis was conducted only on the steady state flow model calibration, and included the following parameters:

- Hydraulic conductivity of Layer 1, and Layers 2 and 3
- Low hydraulic conductivity in the vicinity of EW-12
- High hydraulic conductivity of the Platte Valley aquifer near the Platte River
- Vertical anisotropy ratio of Layer 1, and Layers 2 and 3
- Evapotranspiration rate and extinction depth

- Recharge rate
- River conductance of the Platte River, the Elkhorn River, and Wahoo Creek
- Drain conductance of agriculture drain tiles
- Drain conductance of Silver Creek, Clear Creek and Johnson Creek
- General head boundary conductance

The sensitivity of each parameter was evaluated by comparing the statistical calculations of the head for each model sensitivity run to the same statistical measures of results from the calibrated steady-state model. The results of this sensitivity analysis are presented in **Table 5-8**. Among the three comparison criteria, the standard deviation is the most meaningful. The change of the values of the standard deviation over the head range at the site in most cases is too small, and the mean value is averaged from positive and negative residuals.

As shown in **Table 5-8,** the most insensitive parameters include: general head boundary conductance, the river conductance of Wahoo Creek and the Elkhorn River, the drain conductance of Clear Creek both upstream and downstream, and the drain conductance of the agricultural drain tiles, because of the significant distance of these features from the area of interest where data are most concentrated.

The most sensitive parameter is the hydraulic conductivity of Layers 2 and 3, followed by evapotranspiration extinction depth, and groundwater recharge. The change of hydraulic conductivity near EW-12 and the highest K zone near the Platte River do not change the overall statistics substantially, but actually change the local results significantly. An increase of evapotranspiration rate does not improve the results, but an increase of the evapotranspiration extinction depth improves the model results, because it affects the size of the area that is subject to groundwater evapotranspiration. This may suggest the actual extinction depth in Platte Valley and Wahoo Valley may be deeper than the literature value of six ft (Bouwer, 1978), perhaps because the saturated fine grained alluvium may enhance the groundwater evapotranspiration. The head residual is not very sensitive to the drain conductance of Johnson Creek and Silver Creek, while the simulated fluxes of the creeks are sensitive to the drain conductance, which is not reflected in **Table 5-8**.

The sensitivity analysis conducted here is only for the calibration of steady state flow model. The sensitivity analysis for the transient flow conditions was conducted during the calibration but not reported here because the quantitative comparison is not straightforward. The more important sensitivity analysis for prediction simulation is not reported, because the model has not been used for prediction simulations yet. When the model is used for prediction simulations, more sensitivity analysis will be conducted and reported following the guidance of ASTM (1994).

The groundwater solute transport model was developed through three processes:

- Particle tracking simulation for historical plume migration pathways
- Transport simulations for history matching TCE plume migration
- Transport simulations of recent plume migration

The interpreted plumes of TCE and RDX on **Figures 3-1** through **3-4** are used as the basis for these simulations. The particle tracking simulation and the transport simulations from history matching were developed to improve the understanding of the past, and to estimate fate and transport parameters. The transport simulation of recent years was developed to understand the current condition and for prediction of future transport.

6.1 PARTICLE TRACKING OF MIGRATION PATHWAYS

Particle tracking was conducted to simulate the plume migration pathways to verify the flow field calibration.

6.1.1 History Flow Model

The modeling process found that the migration of groundwater contaminant plumes has been influenced significantly by irrigation pumping, which has increased gradually since 1955. In order to track the plume migration directions, a transient-history flow model was developed to incorporate the irrigation pumping over time from 1961 to 2005 to approximate the long-term variable average flow conditions.

The history flow model is a transient model, which includes nine stress periods over 45 years from 1961 to 2005. Each stress period lasts five years and contains 10 time steps. The irrigation pumping locations and rates change every five years from 1961 to 2005 based on NDNR registration records (NDNR, 2006). The annual average irrigation pumping rates in **Table 2-12** were used as input. In the last stress period from 2001 to 2005, it was assumed that the FNOP containment system was pumping, except for EW-12. The boundary conditions, the groundwater recharge and evapotranspiration, and other water supply pumping were assumed to be the same as in the steady state model (Section 5.2.3). The storage coefficients were the same as for the five-year transient flow model (Section 5.6.2). The history flow model was first run for a few years starting from the steady state condition and the result was used as the initial condition for the 45-year simulation.

6.1.2 Particle Tracking Results

The particle tracking simulation results are shown on **Figures 6.1-1** and **6.1-2**. For this modeling analysis, the particles were initially placed near the presumed source areas of the TCE and RDX plumes, in both Layers 1 and 2. The particle tracking was simulated for 45 years from 1961 to 2005, assuming the contaminant plumes started in 1960. The colors of particle tracking lines represent the particle tracks during different time periods. In the LL1 and AMA plumes, the particle tracks follow the central high concentration zones all the way to the leading edges of the plumes. During migration, these particles are influenced by the historical trend of increasing irrigation pumping. In the AMA plume, the particles initiated in Layer 2 (**Figure 6.1-1**) in the south branch of the plume moved upward towards the agriculture drain tiles and Johnson Creek, while the particles initiated in Layer 3 (**Figure 6.1-2**) moved to Johnson Creek, and to Clear

Creek to a much lower extent. The particles initiated in Layer 2 downgradient of the former Landfill area discharged to Layer 1 and then to the ground surface (**Figure 6.1-1**). The particles initiated in the LL1 plume moved more slowly than in other areas, due to the relatively lower hydraulic conductivity and smaller hydraulic gradient. The particle movement in the latest five-year period (2001 to 2005) was particularly slow as the particles entered the low K zone near EW-12. The particles in the RDX plumes moved toward the extraction wells EW-6, EW-7, and EW-9 during the last five years. The particles initiated in the LL3 RDX plume bypassed the locations of EW-3 and EW-2 during 1991 to 2000, prior to the time when the simulated extraction wells were turned on in 2001 (Note that this is the simulated turn-on time in the history model, but not the actual starting time of pumping). The bypassed particles eventually moved either upward to the drain tiles (Layer 2) or to Johnson Creek (Layer 3). Since these particle lines pass through EW-3 and EW-2, if they had not reached the extraction wells prior to 2000, they would have been captured by EW-3 and EW-2 during the simulated five-years of FNOP containment pumping.

The particle tracking simulation results provide a quick evaluation of the simulated flow field with regard to plume migration directions and pathways. However, because the particle tracking cannot simulate the multiple factors that influence plume fate and transport, such as retardation, dispersion, and dilution, the speed of particle movement and the speed of plume migration are different. In this highly dynamic flow system, where the irrigation pumping and the FNOP pumping change over time, the particle tracking results and the simulated plume migration may not be exactly the same in every detail.

6.2 HISTORY MATCHING OF TCE PLUME MIGRATION

Solute transport simulations were conducted to estimate the fate and transport parameters and to test the model's compatibility to simulate the historical migration directions, extents, and concentrations of the TCE plumes. Constant or variable source concentration cells are assumed near LL1 and AMA even though the actual locations are not precisely known. Whereas the paths of the plumes are dependent upon calibrated parameters of the flow field, the simulated extents and concentrations of the plumes are strongly dependent on the assumed number, location, extent, timing, volume, and concentrations of the assumed releases, as well as the assumed retardation and dispersion, and the properties of the vadose zone.

6.2.1 Hypothetical TCE Source Conditions

To simulate the history matching of the plume migration, source concentration conditions need to be specified. Because the actual history and conditions are not known, the locations, timing, and concentrations of hypothetical sources must be assumed in order to perform transport calibration through history matching.

It should be noted that assumptions about the source concentration areas were selected only based on the general comparison of simulation results. It is likely the history matching results can be re-created using several different assumptions of specified source concentration cells with different locations, levels, and timing. Thus, the specified source concentration cells cannot be considered to represent the actual sources, but are only hypothetical starting conditions that present one of many possible non-unique solutions for approximating the observed plumes. The actual source conditions are complex, and it is unlikely that the precise location, quantity, and variation over time of the sources can ever be known with certainty. Thus, history matching is

not an attempt to identify the potential source conditions through modeling, but rather an attempt to calibrate the transport model.

The specified source concentration cells are assumed to be located in the vicinity of the potential source areas as discussed in Section 3.2. For the LL1 TCE plume, the assumed source concentration cells are located in both layers in the area of the load line formerly used as the AFBMD Tech Area, where TCE was allegedly used some time between 1959 and 1964 (**Figure 6.2-1**). The specified time-varying concentrations are based on the comparison of simulation results with the interpreted TCE plumes on **Figure 3-3**.

The sources in the AMA plume were simulated using two methods: (1) specified source concentration cells and (2) relatively larger areas of very high distribution coefficient (K_d). Two source concentration cells with time-varying concentrations (**Figure 6.2-2**) in both Layers 2 and 3 are assumed at location about one-mile north of LL4 and near the high concentration area. Two source concentrations cells are assumed downgradient of the former Landfill area specified with relatively lower constant concentrations. In addition, two high K_d zones are assumed at the heads of the plume with specified initial concentrations to simulate finite residual sources. The finite residual source simulation was assumed based on the observed extents of the plumes and the associated low concentrations. The high K_d zone may represent the earlier spread of a small amount of residual TCE that adsorbed on soils and have slowly and continuously contributed to the plume. A linear sorption isotherm is assumed in the model. The simulated soil concentrations decrease proportionally with the simulated decrease of groundwater concentrations as the result of strong dilution.

Due to the lack of data on the history of the releases, the history matching simulation focuses on calibration of the plume migration pathways, which are the most important factors in the future management of remedies. Matching of the plume extents and migration velocity were also used to evaluate the reasonableness of dispersivity and the natural distribution coefficient (K_d) (Section 6.2.2). However, the history matching in this study does not intend to match the observed concentration distributions, the precise observed plume extents, and the contaminant masses, due to the lack of historical data of plume migration over time.

6.2.2 Fate and Transport Parameters

The fate and transport parameters include porosity (effective porosity), water distribution coefficient, and rate of biodegradation.

Aquifer	Porosity	Effective Porosity
Platte Valley	0.3	0.3
Todd Valley	0.3	0.3
Wahoo Valley	0.3	0.3
Overbank Deposits	0.3	0.15

The porosity and effective porosity for the coarse materials are assumed to be the same (de Marsily, 1981), and are used and verified in the particle tracking and transport simulations. The effective porosity of overbank deposits is assumed to be half of the porosity (de Marsily, 1981). The effective porosity of overbank deposits is used in the particle tracking and transport simulation.

Parameter	Value
Longitudinal dispersivity	1 ft
Transverse dispersivity	0.1 ft
Vertical dispersivity	0.01 ft
Bulk density	1.86 g/cm^3
Fraction of organic carbon (f_{oc})	3.00E-03
K_{oc}	107 cm^3/g
Distribution coefficient (k_d)	0.03 cm^3/g
Biodegradation half-life	65 yrs

The dispersivity values were estimated through model simulations. Because the observed plumes, especially the high concentration zones, are very narrow in comparison to their lengths, small dispersivity values are required to match the plume extents. The fraction of organic carbon content (f_{oc}) was estimated based on the soil total organic carbon content sampled in the saturated zone (Woodward-Clyde, 1993). The soil-water distribution coefficient, K_d, was calculated by multiplying f_{oc} by K_{oc} (Knox, et al. 1993). The resulting retardation factor in the Todd Valley alluvium (effective porosity of 0.30, Section 5.6.2) is 1.19, indicating adsorption of TCE to soil is low and the contaminant transport velocity is only slightly reduced from the groundwater seepage velocity.

Cis-1,2-DCE was found at low concentrations in the EW-11 Investigation in 2002 (URS, 2002). The high percentage of cis-1,2-DCE in total DCE suggests that cis-1,2-DCE is the biodegradation daughter product of TCE. Since data are not adequate to estimate biodegradation half-life, it was assumed that the biodegradation half-life was 65 years, the same as that estimated for the Hastings site (URS, 2000). The Hastings site is similar to the FNOP in that it has TCE plumes of a similar age in a thick, aerobic sand aquifer. The Hastings biodegradation rate, which is fairly modest, was estimated using the Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water (USEPA, 1998).

6.2.3 Computation Algorithms

During the fate and transport simulations, it was found that the results are particularly sensitive to the selection of the computation algorithm. The observed and interpreted TCE plumes are narrow, which is consistent with small dispersion. However, the simulated plumes show significant dispersion if the commonly used higher-order finite-volume method (TVD) is selected, causing the plumes to widen during migration. This is believed to be the result of numerical dispersion, not the actual dispersion in the aquifer.

MT3DMS offers five computation algorithms and states that "no single numerical technique has been shown to be effective for all transport conditions" (Zheng and Wang, 1998). Testing of various algorithms found that among those, the method of characteristic (MOC), resulted in the best solution, which shows only minor numerical dispersion. Thus, MOC was selected and applied as the computation algorithm for the fate and transport simulation. The limitation of MOC is that the accuracy of mass budget is not as good as that of TVD, but is still acceptable.

6.2.4 History Matching Simulation Results

The history matching simulation results generally match the observed migration directions, extents, and concentration distribution of the TCE plumes. However, due to the complexity of field conditions regarding plume migration, the simulated plumes can only mimic the general shape of the observed concentration distributions, but not the details. Nevertheless, the history matching results are remarkably similar to the observed plumes in comparison to the history matching results of previous model versions.

6.2.4.1 LL1 TCE Plume

The simulated LL1 TCE plume migration for 45 years is shown on **Figure 6.2-3** and **6.2-4.** The simulated LL1 plumes in Layers 2 and 3 at 10-year intervals are presented through 2002. The simulated plumes of 2002 (shown as filled color contours) mimic the major features of the observed plume (the contours from **Figures 3-3** and **3-4** shown as unfilled black contour lines) that was interpreted from the sampling results from 2002-2004:

- The simulated plumes have a long and narrow central zone of high concentrations similar to the observed plumes.
- The simulated plumes in both layers have a narrower extent of the plume's leading edge with lower concentrations similar to the observed plumes.
- The patterns of the simulated plumes in Layers 2 and 3 are similar to the observed plumes.
- After 2 years of pumping, the simulated plume is pulled toward EW-8, as is seen in the observed plume.

6.2.4.2 AMA TCE Plume

The simulated AMA TCE plume during the past 45 years are shown (in color as filled contours) on **Figures 6.2-5** and **6.2-6**. The simulated plumes generally mimic the major features of the 2005-2006 observed plumes (the contours from **Figures 3-3** and **3-4** shown as unfilled black contour lines):

- The simulated plumes have a long and narrow central high concentration zone that resembles the central line of the observed plume.
- The simulated concentrations near the AMA are higher in Layer 2 than in Layer 3, but the simulated concentrations in the downgradient portion of the plume are lower in Layer 2 than in Layer 3, as observed.

Comparison of the simulated plumes of 2000 and of 2005 (the last two panels on **Figures 6.2-5** and **6.2-6**

) illustrates an important phenomenon, the effect of the FNOP pumping for five years prior to 2005. In 2000, the downgradient portion of the central high-concentration zone (about two thirds of the way down the full length of the plume) is slightly to the north compared to the interpreted central lines (based on data from 2005-2006), while in 2005 it shifts to the south slightly to line up with the interpreted plume. The shift is the result of simulating the FNOP pumping for five

years in the last stress period. This result appears consistent with the observations at MW-45A and MW-45B (**Figures 3-3** or **3-4**), where the TCE concentrations decreased in recent years.

6.3 SIMULATED TCE PLUME MIGRATION IN RECENT YEARS

To be useful in future predictions, the fate and transport model developed for the history matching needed to be revised to adjust for the following factors: (1) the historical irrigation pumping is different than current conditions, and (2) the simulated plumes of 2005 are somewhat different than the current definition of the plume concentrations. Thus, for future predictions, the fate and transport model has been refined to better represent the plume migration in recent years, using (1) a steady state flow model representing the recent average flow conditions and (2) the interpreted TCE plumes as initial concentration conditions.

6.3.1 Steady State Flow Model Representing Recent Average Flow Condition

This model is a modification of the calibrated quasi-steady state model (Section 5.2). The major modification is the simulation of the annual average irrigation pumping rates following the estimated irrigation pumping rates of 1996 to 2005 (**Table 2-11**).

6.3.2 Simulation of TCE Plumes for Five Years

The interpreted shallow and intermediate TCE plumes (**Figures 3-3** and **3-4**) are directly input to be the initial concentrations in the fate and transport model. The assumed source concentration cells in the last stress period of the history matching simulation are used as the basis for specifying the constant concentration cells.

6.3.2.1 LL1 TCE Plume

Figure 6.3-1 shows the simulated LL1 TCE plumes in Layer 2 and Layer 3 at the end of year 5. In comparison to the initial concentrations (shown as unfilled black contour lines), the entire plume has expanded to the south towards EW-12. The high concentration zones greater than 1,000 µg/L and 10,000 µg/L have moved a little further downgradient and westward, as the result of pumping at EW-12 and EW-8. The dilute front edge of the plume downgradient of EW-12 has dispersed as the result of five years of pumping by EW-12.

6.3.2.2 AMA TCE Plume

Figure 6.3-2 shows the simulated AMA TCE plume in Layers 2 and 3 at the end of simulation year 5. Compared to the initial conditions (shown as unfilled black contour lines), the overall simulated plume, and the central high concentration zone, shifted to the south away from the interpreted central lines in both layers, which is the result of the FNOP pumping during the past five years.

6.3.2.3 Simulated TCE Mass Fluxes

The simulated TCE concentrations and mass fluxes into the surface water bodies and extraction wells are presented in **Table 6-1**. The calculations are based on the simulated plume at the end of year one and year five. In the AMA plume area, the simulated TCE concentration in the fluxes to Johnson Creek between JC-2 and EW-1 (**Figure 5.2-5** or **Figure 3-3**) range from 20 to 60 µg/L. At Johnson Creek, the multiple surface water sampling results at SW-8 (**Figure 3-3** or

3-4) from 2004 to 2006 vary between 30 to 60 µg/L, with only one exception. In the LL1 plume, the simulated TCE mass recovery rate at EW-8 ranges from 50 to 100 grams/day (or 40 to 80 lbs/year). The TCE recovery rate of 2006 from the containment extraction system is 91 lbs (ECC, 2006), in which most TCE was extracted from EW-8. These comparisons indicate the model-simulated mass fluxes are in a reasonable range. EW-8 is no longer considered a containment well for the LL1 TCE plume although, it was a containment well when it was initially installed as part of the Containment Removal Action in 1998. EW-8 will be shut down later this year when EW-11 begins operation.

The simulated fluxes are obtained from the steady state flow model with irrigation well pumping. The rates of the fluxes to the surface water bodies are somewhat lower than the steady state calibration results (**Table 5-4**) due to the additional pumping. The simulated TCE concentrations and masses after year 1 may be more influenced by the initial conditions while the results at the end of year 5 may reflect the effects of five years of FNOP pumping. The major difference in the results at the end of year 1 compared to those at the end of year 5 is the simulated concentration at the drain tiles near Johnson Creek. This is due to the fact that the initial concentrations in the drain tile area of Layer 1 were not specified, i.e., this area was assumed to have zero concentration at the beginning of the simulation. In year five, the simulated concentrations moved upward to the drain tiles so the concentrations were significantly increased. The result from year 5 should be more representative of the actual condition at the drain tiles. In general, the simulated TCE concentrations and the mass fluxes between the two years are in the same order of magnitude and comparable with some observations.

The model results provide an indication of the site conditions and the effect of the FNOP pumping. The simulated concentrations and mass fluxes to the drain tiles (130 grams/day or 100 lbs/yr) (**Figure 5.2-5**, Section 13) and Johnson Creek (120 grams/day or 100 lbs/yr) (**Figure 5.2-5**, between JC-2 and EW-1) are much higher than to EW-1 (2 grams/day or 1 lb/yr), which appear to indicate that the drain tiles and Johnson Creek are major factors in the containment of the AMA plume. The irrigation wells within the AMA plume (**Figure 6.3-2**) (200 grams/day or 150 lbs/yr) may have also played an important role of mass removal. In the LL1 plume area, the simulated flux to Silver Creek in the section downgradient of the plume is zero. This is the result of a decline in the water table due to pumping at EW-12 and EW-8. The simulated total TCE mass removed from the aquifer to the surface water bodies and to the extraction wells is around 500 grams/day or 400 lbs/yr in recent years, while the simulated FNOP containment system (90 lbs/yr) removes about one fourth of the total.

6.4 UNCERTAINTY OF TRANSPORT MODEL RESULTS

The results of the fate and transport model are subject to many uncertainties, including:

- Numerical dispersion of the computational algorithm of the computer code
- Irrigation pumping locations and estimated historical pumping rates
- Assumed source locations, source concentrations, and their variations over time
- The estimated soil-water distribution coefficient, K_d
- The estimated bio-degradation half-life

These factors are the major sources of uncertainty in the fate and transport model results. Since further reducing the uncertainties of these factors is difficult, further improving the accuracy of the solute transport model is also difficult. Thus, interpretation of the model results should consider the uncertainties and limitations of the model. Overall, one should rely on the model results as reasonable indications of future conditions, rather than as exact values of concentrations.

This modeling project compiled and evaluated a large quantity of data relevant to the natural hydrologic system and contaminant migration, including geology, hydrogeology, hydrology, water supply, irrigation, groundwater contaminant sampling results, and containment system operation. The contours, tables and graphs summarizing the data in this report provided a sound basis for developing the conceptual model and the numerical models.

The larger site-scale numerical groundwater model simulates this complicated hydrogeologic system with adequate detail for remediation system evaluation. The model was developed through the iterative process of quasi-steady state calibration, steady state verification, five-year transient calibration, and short-term (shutdown test) calibration. The aquifer hydraulic conductivity distribution, which is the most critical parameter that affects groundwater flow, is considered to be well calibrated, especially in the vicinity of the FNOP containment system. The particle tracking reasonably simulated the migration pathways of the groundwater contaminant plumes. The groundwater fate and transport model reasonably simulated the historical TCE plume migration pathways, the extents of the plumes, and the approximate concentration distribution within the plumes.

The process of the model development has significantly improved the understanding of the hydrogeologic conditions at the site. The principal findings of this modeling work are:

- The Platte River is the major source of water to the two major water supply well fields. The mutual impact of the water supply well fields and the FNOP containment system appears to be limited, and can be further evaluated using this model.
- The irrigation wells within or near the plumes appear to have substantially influenced migration of the plumes.
- After five years of continuous pumping of the FNOP containment system, the AMA plume appears to have been pulled toward the south slightly away from the historical plume migration pathway, which may not have been anticipated in the previous remedial design.
- As shown in the model simulation in recent years, the AMA plume appears to have been primarily contained by Johnson Creek and the agriculture drain tiles, while EW-1 may only play a minor role.

The GWM06 model will serve as a powerful tool for future evaluation and predictions. Uncertainties of the hydraulic parameters in the model are considered to be controlled reasonably well in regards to the modeling objectives. However, the future contaminant transport simulations may be subject to greater uncertainties because of the uncertainties of the fate and transport input parameters, and the numerical dispersion inherent in the computer code. Nonetheless, the model provides a reasonable basis for the future evaluation of the remediation systems even though the results are subject to these limitations.

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Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2669096	489830.8	65	G-095065	103897	Light Brown Clay	1244.4588	1179.4588	929.89
2667966	486587.2	50	G-084296	94792	LIGHT BROWN CLAY	1219.3451	1169.3451	984.51
2635846	537458.2	18	G-135560	167934	clay	1133.8646	1115.8646	1098.08
2652706	463279.6	9	G-089876E	104914	SILTY CLAY VERY MOIS	1060.3383	1051.3383	1024.12
2661572	525520.2	10	G-133835	168006	light brown clay	1100.401	1090.401	1057.27
2667362	510430.2	75	G-105544	123380	light brown clay	1249.5039	1174.5039	1049.23
2662912	518951.9	64.7	G-107795	128514	Light gray clay	1167.752	1103.0163	1101.02
2665212	507275.8	88	G-113706	137456	LIGHT GRAY CLAY	1256.6451	1168.6451	1064.97
2667940	507364.1	96	G-133109	166988	light gray clay	1275.762	1179.762	1035.95
2606961	529638.5	19	G-082411C	91884	CLAYEY SILT	1200.7197	1181.7197	1083.31
2642503	460138.7	20	G-130942I	163463	clay, silty, dark br	1070.33	1050.8117	1048.81
2662204	526832.8	14	G-089499	101804	CLAY LAYERS	1101.429	1087.429	1053.29
2607346	529272.9	17	G-076195	84689	LEAN CLAY	1199.5808	1182.5808	1084.41
2668711	487749.5	55	G-118079	143844	light brown clay	1256.5441	1201.5441	951.79
2638423	530511.4	34	G-127687	159253	light brown clay	1125.853	1091.853	1088.28
2634643	507819.6	40	G-095562	111039	Medium Gray Clay	1102.6773	1062.6773	1034.42
2656858	538526.6	27	G-133995	168188	clay	1114.1385	1087.1385	1068.47
2655896	464635.9	10	G-109464N	131244	brown clay	1051.5926	1041.5926	993.89
2640129	491863	20.5	G-116922E	142211	reddish brown silty	1080.3874	1059.8874	1007.37
2654872	537385.7	28	G-139125	175426	dark gray clay	1116.2802	1088.2802	1058.04
2628140	485091.2	19	G-018285	24278	YELLOW CLAY	1133.2804	1114.2804	1031.72
2638121	533087	30	G-093944	109243	LIGHT BROWN CLAY	1152.5337	1122.5337	1102.84
2669123	481051.9	70	G-101457	119036	Light Brown Clay	1254.2763	1184.2763	1001.98
2600719	516647.3	17	G-037709	44868	YELLOW CLAY	1187.4721	1170.4721	1070.72
2638582	532464.4	22.4	G-087861	99817	YELLOW CLAY	1121.131	1098.7346	1096.73
2663737	509417.2	78	G-109504	130790	light gray clay	1262.3209	1184.3209	1047.46
2660500	554063.4	13	G-074622	82971	TOPSOIL AND CLAY	1120.4567	1107.4567	1037.18
2607067	529965.8	19	G-076173	84667	SAME AS ABOVE	1200.437	1181.437	1083.03
2642524	460193.6	20	G-130942H	163462	clay, silty, dark br	1070.3831	1050.518	1048.52
2647787	513387	16	G-127515	159032	Top soil and clay	1098.4097	1082.4097	1005.94
2652777	463206.8	8.5	G-089876H	104917	SILTY CLAY VERY MOIS	1060.3574	1051.8574	1025.10
2633958	506380.1	10	G-097059	113056	Clay	1109.98	1099.98	1034.21
2627210	555126.3	22	G-033471	40498	YELLOW CLAY	1152.2362	1130.2362	1057.10
2608048	499398.3	24	G-097847F	114661	Clay, Tan	1151.7997	1127.7997	1007.36
2664076	504665.7	75	G-133956	168001	light gray clay	1223.8167	1148.8167	1060.69
2664791	470263.1	20	G-137827	173157	light brown clay	1152.2594	1132.2594	1103.64
2616353	518282.2	15	G-072842	150951	top soil w/clay	1174.38	1159.38	1062.75
2632993	540635.5	75	G-106260	125311	light gray clay	1239.7569	1164.7569	1051.89
2661760	470642.2	14.4	G-052415	59970	BROWN CLAY	1061.5265	1047.1231	1045.12
2638538	529605.8	26	G-116094	140689	dark gray clay	1120.3762	1094.3762	1081.94
2662706	510715.2	8	G-111654	133245	BROWN CLAY	1148.9749	1140.9749	1030.83
2651135	547627.1	32	G-105269	125204	silty gray clay	1129.4267	1097.4267	1030.41
2657444	496157.7	14	G-107100	127531	DARK BROWN CLAY	1080.4	1066.4	1027.50
2667315	486381.6	59	G-081826	90941	LIGHT BROWN CLAY	1185.0333	1126.0333	967.89
2662036	512197.9	14	G-081628	90541	BROWN CLAY	1140.532	1126.532	1033.33
2667039	512286.5	80	G-119231	145809	LIGHT GRAY CLAY	1260.3738	1180.3738	1058.04
2634987	495129.4	20	G-097847J	114674	Blue-Gray Clay	1068.0667	1048.0667	1035.00
2632113	542680	60	G-105055	125049	tan clay	1220.1298	1160.1298	1078.10
2652342	464397.6	7	G-089876B	104911	SANDY SILTY CLAY TO	1060.3524	1053.3524	1005.28
2633770	515375.8	42	G-100841	118716	Red-Brown Clayey Sil	1143.1642	1101.1642	1028.35
2635331	495241.1	21	G-097847H	114668	Gray-Black Gray Clay	1069.1743	1048.1743	1034.32
2669130	484962.4	65	G-112393	135344	LIGHT BROWN CLAY	1264.9238	1199.9238	976.72
2667010	484706.6	68	G-089357	101609	SANDY TAN CLAY	1161.9363	1093.9363	970.20
2614928	546595.6	60	G-087127	98901	YELLOW CLAY	1223.2513	1163.2513	1114.63
2605570	523544.4	21	G-081204	89859	YELLOW CLAY	1193.0122	1172.0122	1071.50
2638291	531822.3	16	G-117985	143667	light brown clay	1139.633	1123.633	1094.16
2662031	512082.9	17	G-083197	93098	CLAY	1140.6273	1123.6273	1033.02
2647507	514590.4	18	G-127649	159214	Clay	1099.401	1081.401	1012.87
2632950	540712.6	71	G-127394	158870	light gray clay	1238.0941	1167.0941	1053.59
2643277	499181.4	16	G-105029	124225	topsoil & clay	1080.9024	1064.9024	1016.48
2659675	514502.5	18	G-131161	163744	Brown clay and sand	1100.4	1082.4	1028.96
2601523	476640.7	57	G-085835	97197	CLAY	1181.0184	1124.0184	1106.93
2596171	527475.5	18	G-062375	70227	3FT CLAY 12FT SAND	1200.471	1182.471	1074.76
2667193	506925.8	38	G-116437	141346	light gray clay	1217.463	1179.463	1037.40

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2659468	506910.4	24	G-073294	81487	CLAY	1090.4316	1066.4316	1035.19
2637587	534020.6	50	G-139266	175575	light brown clay	1208.3879	1158.3879	1100.90
2665772	506155.5	73	G-139162	175448	LIGHT GRAY CLAY	1238.4403	1165.4403	1072.93
2642211	460226.7	11.5	G-135936C	170507	clay, silty, red/bro	1071.6164	1060.1164	1045.10
2608488	520361.4	18	G-057314	64983	CLAY	1190.438	1172.438	1072.24
2635347	532321.3	58	G-093417	108080	LIGHT GRAY CLAY	1205.477	1147.477	1092.66
2662812	512757.4	38	G-092775	108078	BROWN CLAY	1206.3594	1168.3594	1036.80
2607002	530009.5	18.5	G-076183	84677	SILTY CLAY MED GRY M	1200.4373	1181.9373	1082.89
2631136	497961.7	37	G-009205	13866	CLAY	1132.4487	1095.4487	1044.14
2664335	509334.3	80	G-132163	165506	tan clay	1273.1847	1193.1847	1049.36
2664801	477062.5	37	G-087550	99423	LIGHT BROWN CLAY	1095.4233	1058.4233	1045.96
2638625	529151.2	27	G-099245	116010	Clay	1120.3313	1093.3313	1080.57
2594054	507950.8	18	G-059114	66829	CLAY	1151.4519	1133.4519	1055.34
2642471	502745.4	22	G-103207	121952	topsoil & clay	1088.3498	1066.3498	1026.29
2636332	482136.6	20	G-139424	169005	brown clay	1070.243	1050.243	1008.35
2607367	529698.1	18.5	G-076190	84684	LEAN CLAY MORE HEAVI	1199.473	1180.973	1083.90
2666970	536893.9	32	G-135021	168059	Gr Fat Clay Some Ln	1129.557	1097.557	1069.76
2660120	514824.4	8	G-131162	163745	Brown clay	1100.2144	1092.2144	1050.19
2663522	520114.1	65	G-102455	120860	light brown clay	1224.0212	1159.0212	1105.55
2665840	479726.5	40	G-118819	145285	tan clay	1114.9856	1074.9856	1020.69
2667219	506320.3	35	G-118081	143846	light brown clay	1211.6495	1176.6495	1026.11
2665372	483453.4	40	G-124271	153785	SANDY LIGHT BROWN CL	1121.1446	1081.1446	964.26
2633833	495178.9	23	G-097847M	114680	Clay, Gray-Blue	1080.436	1057.436	1035.86
2659344	555181.8	28	G-003473	7206	TOPSOIL AND CLAY	1120.457	1092.457	1037.33
2650075	542347.1	21	G-124398	153901	fine sand	1124.0469	1103.0469	1018.23
2607113	529311.5	15	G-076194	84688	LEAN CLAY LIGHT OLIV	1201.345	1186.345	1083.91
2660784	511116.4	24	G-084915	95915	BROWN CLAY	1099.4043	1075.4043	1038.80
2631126	514814.4	45	G-136517	170356	Brown clay	1171.9638	1126.9638	1033.45
2646130	509164.8	7	G-127738	159323	Top soil and clay	1098.4468	1091.4468	1004.75
2633077	519051.5	38	G-053963	61539	YELLOW CLAY	1172.1362	1134.1362	1045.13
2628127	485726.6	14	G-129323C	161445	light brown, moist,	1133.0395	1119.0395	1033.47
2662751	544567.7	29	G-063312	71214	BLUE CLAY	1110.457	1081.457	1059.96
2652606	463279.4	6.5	G-095825A	112387	Sandy Silt, Fine to	1059.84	1053.34	1023.98
2662991	472648.1	15	G-073894	82234	BROWN CLAY & SAND TR	1067.5627	1052.5627	1036.80
2591394	517768.3	16	G-070615	78777	YELLOW AND GRAY CLAY	1161.6148	1145.6148	1075.74
2626077	547759.6	75	G-058833	66537	GRAY AND BROWN CLAY	1228.0582	1153.0582	1102.27
2638125	479257.6	27	G-120168	147600	gray clay	1070.243	1043.243	1007.34
2638558	506130.5	30	G-115162	138837	clay	1070.5872	1040.5872	1038.27
2659433	507749.2	27	G-014161	19586	YELLOW CLAY	1094.2254	1067.2254	1030.23
2635902	531322.3	40	G-105827	125458	clay	1184.627	1144.627	1092.44
2590009	507833	19	G-053470	61033	YELLOW CLAY	1147.4602	1128.4602	1053.89
2662852	505792.3	25	G-093587	108759	LIGHT BROWN CLAY	1179.3989	1154.3989	1059.21
2666605	513483.1	93	G-125698	156439	light brown clay	1265.9708	1172.9708	1055.77
2593526	548747.9	25	G-056450	64085	CLAY	1230.507	1205.507	1093.41
2636529	489925	20	G-134121	166038	3`sand & clay mixed,	1070.2523	1050.2523	1022.64
2664663	494552.3	40	G-051833	59375	YELLOW CLAY	1141.3566	1101.3566	994.40
2652865	463182.4	8	G-089876K	104920	SILTY CLAY VERY MOIS	1060.3445	1052.3445	1025.47
2665324	519626.3	92	G-087839	99644	LIGHT GRAY CLAY	1253.4993	1161.4993	1111.38
2635003	494830.1	22	G-097847L	114679	Clay, Blue-Gray	1068.5353	1046.5353	1035.76
2631663	540814.7	42	G-105161	125262	grey & brown clay	1190.4978	1148.4978	1082.88
2618627	523015.7	30	G-053078	60637	YELLOW CLAY	1187.4371	1157.4371	1066.24
2593795	476644.9	125	G-084434	95138	CLAY	1293.7346	1168.7346	1164.10
2628773	485732.5	23	G-018285	24277	YELLOW CLAY	1138.7626	1115.7626	1033.85
2655608	467993	55	G-081125	89780	COARSE GRAVEL	1055.3668	1000.3668	996.63
2659140	550126.2	25	G-135640	170383	Dark gray clay	1121.4363	1096.4363	1035.08
2659140	550126.2	25	G-135792	170384	Dark gray clay	1121.4363	1096.4363	1035.08
2647525	531058.1	8	G-090439	105635	LIGHT GRAY CLAY	1112.7904	1104.7904	1033.57
2634826	504785.7	25	G-097771	113069	Black Clay	1090.4408	1065.4408	1038.69
2601676	484632.7	78	G-072864	81052	YELLOW CLAY	1197.9634	1119.7687	1117.77
2590062	517765.7	17	G-040328	47565	YELLOW CLAY	1181.6809	1164.6809	1079.00
2657562	517149.1	15.7	G-088299	100312	SANDY BROWN CLAY	1118.3696	1102.6696	1061.56
2652124	546198.5	23	G-081992	91176	DARK BROWN CLAY	1123.7433	1100.7433	1025.45
2648074	517449.9	19	G-133470	167583	Topsoil and clay	1100.4827	1081.4827	1009.66
2638004	514999.8	28	G-111009	158336	medium gray clay	1111.7659	1083.7659	1026.00

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2629190	537368.2	64	G-049891	57385	CLAY DARK BROWN	1207.6597	1143.6597	1063.06
2621960	474183	12	G-062530A	70393	BROWN CLAY	1090.2551	1078.2551	1045.46
2663933	492000.5	52	G-119146	145682	light brown clay	1133.9299	1081.9299	993.67
2626206	461153.3	38	G-072920	81108	CLAY	1103.2085	1065.2085	1050.08
2605287	523876.6	18	G-131316	140835	brown clay	1193.6134	1175.6134	1072.65
2599345	496081	15	G-135892	156062	sandy clay	1119.4709	1104.4709	1046.15
2632806	541313.8	72	G-092572	103891	BLUE CLAY	1241.3338	1169.3338	1064.44
2666240	513062.2	92	G-128171	159851	light gray clay	1262.5427	1170.5427	1052.59
2620439	495308.7	24	G-108319G	128848	silty clay	1153.1422	1129.1422	1047.94
2633386	519681.2	37.3	G-060250	68020	BROWN CLAY	1165.6822	1128.3822	1031.88
2664700	523934.3	20	G-122338	150827	light brown clay	1174.1365	1154.1365	1120.37
2640824	460369.3	17	G-108620C	130029	lean clay/alluvium	1095.1109	1078.1109	1032.39
2593543	471548.5	45	G-094632	110265	Clay	1241.5846	1196.5846	1180.26
2650588	483471.3	14	G-090802	106157	CLAY	1065.348	1051.348	1014.65
2641208	472922.4	22	G-105902	125986	dark brown & gray cl	1063.8541	1041.8541	1011.70
2615974	510693.5	18	G-036211	43333	BROWN TO YELLOW CLAY	1170.4731	1152.4731	1066.55
2656858	551072.1	23	G-062880	70758	SOFT BLUE CLAY AND S	1121.7896	1098.7896	1032.09
2662287	491289.6	25	G-116108	140664	CLAY AND SAND	1076.5463	1051.5463	1007.47
2635492	516515.8	40	G-136000	170362	Clay and blue clay w	1141.0498	1101.0498	1017.36
2608352	470331.9	45	G-096372	111977	Clay	1153.2728	1108.2728	1104.28
2619965	504947.2	19	G-033750	40781	BROWN CLAY	1160.437	1141.437	1046.88
2620524	476762.1	20	G-058820	66524	BROWN CLAY	1090.256	1070.256	1034.96
2586315	500924.5	22	G-087554	99427	BLUE CLAY	1147.1173	1125.1173	1075.23
2652679	464885.2	10	G-121593	149909	clay	1060.5189	1050.5189	991.52
2649997	555551.2	25	G-106702	126791	CLAY GRAY	1131.3178	1106.3178	1056.56
2625209	508095.1	20	G-083866	94030	CLAY	1161.2014	1141.2014	1071.02
2608727	516828.5	20	G-136421	171148	clay	1190.438	1170.438	1059.95
2624210	497962.6	32	G-108319D	128845	sandy silt	1152.4476	1120.4476	1044.44
2613899	479132.8	22	G-057497	65173	GRAY CLAY	1098.0004	1076.0004	1031.83
2599646	470284	20	G-117776	143393	brown clay	1190.62	1170.62	1148.64
2629488	526884.9	40	G-090720	106078	CLAY	1177.9586	1137.9586	1066.65
2618604	547520.4	47	G-098837	115866	Clay	1222.0214	1175.0214	1113.55
2663195	503816.5	45	G-132159	165502	tan clay	1155.968	1110.968	1044.10
2591407	524632	14	G-097207	113193	Yellow Clay	1177.2732	1163.2732	1069.12
2652708	463283.7	7.5	G-089876F	104915	SILTY CLAY MOIST TO	1060.3365	1052.8365	1024.07
2640843	460420	17	G-108620A	130026	lean clay/alluvium	1095.1728	1078.1728	1032.04
2648850	544218.1	14	G-125693	156433	dark brown clay	1111.457	1097.457	1010.70
2628131	485625.5	14	G-129323E	161446	light brown, moist,	1135.2193	1121.2193	1033.15
2613262	525422.8	20	G-058325	66030	GRAY CLAY	1188.8506	1168.8506	1066.33
2664714	541353.8	29	G-137968	173475	black clay	1120.4491	1091.4491	1072.83
2614063	522185.6	20	G-048425A	55886	CLAY	1182.6046	1162.6046	1066.17
2606231	534127.4	18	G-026970	33620	YELLOW CLAY	1196.5408	1178.5408	1077.92
2618516	525629.7	68	G-071170	79331	BROWN CLAY	1262.4709	1194.4709	1062.88
2663535	475317.5	34	G-049353	56836	TOPSOIL & SILTY CLAY	1069.4436	1035.4436	1020.80
2662778	498575.7	20	G-096067	112597	Blue Clay	1090.401	1070.401	1034.22
2597988	520526.2	20	G-112438	121252	top soil & clay	1190.471	1170.471	1069.94
2644340	533410.3	5	G-086558	98054	DARK BROWN CLAY	1112.3859	1107.3859	1058.69
2610568	529331.4	25	G-084655	95399	CLAY	1199.6413	1174.6413	1084.35
2656220	526465.4	13	G-100754	118254	Clay Layer	1104.4002	1091.4002	1048.43
2656045	526215	13	G-116034	140484	clay	1104.2947	1091.2947	1048.21
2665890	495924.9	73	G-108016	128915	light gray clay	1184.1995	1111.1995	999.93
2603452	524381.5	24	G-108472	129820	brown clay	1200.438	1176.438	1073.76
2623868	492824.3	16	G-051685	59223	YELLOW CLAY	1140.437	1124.437	1043.54
2640933	485724.9	27	G-118091	143581	gray clay	1073.3428	1046.3428	982.57
2660938	548651.4	20	G-018141	24120	GRAY CLAY	1120.457	1100.457	1038.38
2639972	502152.4	23	G-138924	174192	Clay	1076.3922	1053.3922	1032.88
2614744	517723.7	19	G-042325	49613	YELLOW CLAY	1178.1166	1159.1166	1063.23
2606367	485947.3	35	G-120369	148057	gray clay	1121.0775	1086.0775	1068.17
2596927	504903.2	24	G-037984	45147	YELLOW CLAY	1167.405	1143.405	1064.14
2639749	491855.4	17.5	G-116922B	142208	reddish brown silty	1080.3887	1062.8887	1009.89
2654649	539513.5	13	G-090726F	106077	GRAY SILTY CLAY WITH	1117.457	1104.457	1055.80
2608132	533940.1	20	G-126119	153851	clay	1200.4162	1180.4162	1080.63
2591359	535435.6	18	G-066924	74954	YELLOW CLAY	1206.9955	1188.9955	1100.76
2632552	496630.3	11	G-108319A	128842	clayey silt	1098.9893	1087.9893	1041.73

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2601876	541071.3	22	G-004921	8854	TOP SOIL AND CLAY	1224.5019	1202.5019	1100.93
2659149	549924.1	25	G-135639	170382	Dark gray clay	1121.456	1096.456	1034.55
2656922	478945	15	G-094377	110138	Clay	1060.348	1045.348	1025.19
2657463	495733.4	13	G-107101	127532	DARK BROWN CLAY	1080.4	1067.4	1027.19
2644925	461963.3	5	G-086054A	97454	SILT	1059.8503	1055.193	1053.19
2641280	476472.9	27	G-085725	97028	GRAY CLAY	1070.348	1043.348	1012.92
2589945	526396.9	18	G-090605	105800	BROWN CLAY	1192.28	1174.28	1068.56
2659904	511554.1	24	G-056514	64149	GRAY FINE SILTY SAND	1096.5631	1072.5631	1040.00
2608891	525971.1	20	G-109448	121253	Topsoil & Clay	1190.4363	1170.4363	1091.24
2653213	544565.9	16	G-129948	162157	topsoil, brown & bla	1120.457	1104.457	1028.12
2587908	462929.5	9.4	G-129537B	161124	slt/cl, med grey	1209.9354	1200.49	1198.49
2587908	462929.5	9.4	G-129537D	161125	s/cl, dk grey	1209.9354	1200.49	1198.49
2666351	537166.3	10	G-093177	108626	DARK BROWN CLAY	1110.401	1100.401	1067.68
2616104	502124.3	25	G-126187F	156085	clayey silt	1161.4932	1136.4932	1054.98
2616113	502129.8	25	G-126187G	156086	clayey silt	1161.5623	1136.5623	1055.07
2619783	483762.6	20	G-131057	163661	clay	1102.5689	1082.5689	1030.36
2667652	481529	50	G-084119	94464	CLAY	1225.2648	1175.2648	995.19
2589241	499678	17	G-067505	75570	GRAY CLAY	1139.5886	1122.5886	1082.29
2652615	463247.6	6	G-095825B	112388	Clayey Silt, Sandy,	1059.7915	1053.7915	1024.37
2611836	528694.6	19	G-035300	42382	YELLOW CLAY	1191.8195	1172.8195	1081.29
2652452	463673.8	5.5	G-089876N	104923	CLAY SILT TO SILTY C	1059.0031	1053.5031	1018.54
2664820	490597.9	13	G-056838	64487	BROWN CLAY	1127.8292	1114.8292	982.98
2667301	490459.5	50	G-110126	132023	light brown clay	1249.3119	1199.3119	956.77
2637982	526897	65	G-125924	156369	gray clay	1152.9026	1087.9026	1080.06
2662312	533478.3	27	G-134158	168340	Clay`s	1110.401	1083.401	1064.45
2647399	467328.5	17	G-051879	59421	CLAY	1060.348	1043.348	997.68
2641194	468720.9	28	G-090820	106266	CLAY DARK GRAY BROWN	1061.9822	1033.9822	996.84
2613173	544570	80	G-063973	71895	GRAY CLAY	1282.4836	1202.4836	1102.44
2610862	520088.3	15	G-060476	68253	CLAY	1180.4448	1165.4448	1063.44
2586967	549679.8	17	G-135525	170231	clay	1224.6795	1207.6795	1089.01
2634785	546477.5	21	G-094464	110267	Silt	1131.4363	1110.4363	1073.43
2661652	507981.9	20	G-088993	101083	LIGHT BROWN CLAY	1139.8572	1119.8572	1078.41
2635395	501244.5	16	G-053630	61193	BROWN CLAY	1083.4857	1067.4857	1041.35
2605366	536524.1	19	G-015507	21129	YELLOW CLAY	1210.487	1191.487	1077.64
2589449	544334.8	15	G-083550	93544	CLAY	1224.5203	1209.5203	1072.76
2595276	544636.7	15	G-138925	174381	15`top soil, clay, 5	1221.8769	1206.8769	1088.68
2625428	502779.6	20	G-096589	113197	Clay to Fine/Medium	1150.4363	1130.4363	1050.02
2616084	502118.4	25	G-126187E	156084	clayey silt	1161.5419	1136.5419	1054.83
2663759	516613.1	75	G-094600	110492	Light Gray Clay	1262.5021	1187.5021	1102.38
2665058	546181.3	18	G-054568	62157	YELLOW AND BLUE CLAY	1111.758	1093.758	1060.43
2661790	549619.5	20	G-086247	97700	DARK GRAY CLAY	1120.457	1100.457	1039.69
2634769	518456.9	25	G-109287	130341	tan clay, strips of	1148.061	1123.061	1024.61
2599297	528293.1	17	G-073751	169692	Top soil & clay	1206.5274	1189.5274	1077.63
2616150	499805.1	25	G-126187A	156080	silt, w/clay	1160.437	1135.437	1050.02
2629374	509380.7	25	G-101602	119224	clay	1155.8038	1130.8038	1040.78
2666722	466722.7	55	G-113122	136531	SILTY BROWN CLAY	1211.0973	1156.0973	1109.30
2597430	528396	17	G-037681	44840	YELLOW CLAY	1205.926	1188.926	1077.59
2585884	511097	12	G-096373	111146	Yellow Clay Soft	1170.8636	1158.8636	1088.90
2600801	515355.3	19	G-037707	44866	YELLOW AND BLUE CLAY	1185.3431	1166.3431	1067.82
2620508	531494.4	45	G-105924	125475	clay	1260.2215	1215.2215	1063.96
2657858	528629.2	10	G-058057	65751	CLAY	1102.4063	1092.4063	1050.89
2606423	512830.9	20	G-065683	73674	CLAY	1180.438	1160.438	1075.19
2628061	502884	17	G-036213	43336	BROWN CLAY	1141.7155	1124.7155	1046.84
2606423	512823.6	20	G-118340	124741	Tan Clay	1180.438	1160.438	1075.19
2646428	553371.5	22	G-111937	134729	CLAY	1133.457	1111.457	1070.27
2589201	528683.4	16	G-051762	59302	CLAY	1192.522	1176.522	1079.22
2625896	492252.1	15	G-051786	59327	CLAY	1140.437	1125.437	1046.20
2663757	492346.4	51	G-117496	142924	light brown clay	1132.8718	1081.8718	995.64
2642242	460279.1	11	G-135936B	170506	clay, silty, red/bro	1071.7222	1060.7222	1044.86
2611269	500044.1	19	G-135522	169687	brown clay	1162.3296	1143.3296	1037.48
2602433	539080.1	20	G-122977	151642	clay	1217.8114	1197.8114	1096.44
2635111	544735.5	13	G-105692	125452	clay	1130.486	1117.486	1070.86
2605586	516107.7	23	G-048312	55772	YELLOW CLAY	1187.5553	1164.5553	1058.81
2659145	550025.1	25	G-135638	170381	Dark gray clay	1121.4623	1096.4623	1034.80

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Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2639555	515230.3	15	G-100704	118453	gray clay	1100.401	1085.401	1041.76
2591683	544010.5	15	G-053659	61223	YELLOW CLAY	1223.5759	1208.5759	1078.78
2593198	486970.8	38	G-112045	134936	Lt brown sandy clay	1216.9873	1178.9873	1135.78
2620610	554099.9	50	G-022518	153850	tan & yellow clay	1267.2817	1217.2817	1015.07
2596137	524213	20	G-072122	80285	YELLOW CLAY	1200.471	1180.471	1075.32
2627929	506174.9	16	G-033754	40785	YELLOW CLAY	1150.4394	1134.4394	1049.19
2656431	521467.3	8	G-083027	92856	CLAYEY SILT	1100.401	1092.401	1058.20
2665408	552155.2	10	G-073793	82129	TOPSOIL AND CLAY	1120.457	1110.457	1039.40
2640105	491788.4	20	G-116922F	142212	brown to reddish bro	1080.3854	1060.3854	1007.19
2646995	547135.1	13	G-093538	108777	LIGHT GRAY CLAY	1130.457	1117.457	1056.39
2586617	538611.6	20	G-074298	82643	YELLOW CLAY	1210.1421	1190.1421	1117.89
2599240	508963.2	22	G-089221	101446	CLAY	1180.4818	1158.4818	1046.19
2629665	478469.3	19	G-033472	40499	YELLOW CLAY	1119.9239	1100.9239	1029.42
2598646	525681.8	17	G-042956	50266	YELLOW CLAY	1197.7239	1180.7239	1076.94
2664870	478172	49.5	G-093498	109124	BROWN LOESS	1108.7604	1059.2604	1038.58
2600818	533085.8	20	G-058997	66709	CLAY	1208.0128	1188.0128	1078.39
2611337	494197.2	16	G-096593	113203	YELLOW CLAY	1142.3144	1126.3144	1023.15
2629634	481169.4	21	G-053077	60636	BROWN CLAY	1130.3496	1109.3496	1029.44
2654224	550920.1	15	G-003472	7205	TOPSOIL AND CLAY	1121.457	1106.457	1035.34
2640451	495365.5	14	G-122118	150591	gray/brown clay	1080.4	1066.4	1021.00
2613313	510348.6	25	G-096588	113196	Subsoil, Brown Clay	1178.0876	1153.0876	1068.27
2614696	511214.6	22	G-087929	99912	BROWN CLAY	1174.4375	1152.4375	1069.09
2667172	487573.1	35	G-099950	117317	brown loess	1197.0184	1162.0184	959.92
2629844	499439.5	15	G-111534	134400	brown clay	1135.4743	1120.4743	1046.97
2611211	527288.5	18	G-084524	95055	YELLOW CLAY	1190.438	1172.438	1080.77
2655022	472990.4	13	G-055915	63529	LOAMY CLAY GRADING T	1060.348	1047.348	1006.28
2661238	497689.9	19	G-094585	110243	Topsoil & Clay	1086.3678	1067.3678	1024.03
2606725	521388.8	18	G-065589	73580	YELLOW CLAY	1191.8345	1173.8345	1064.95
2607959	529473.6	18	G-076193	84687	LEAN CLAY	1198.0327	1180.0327	1085.02
2621508	523813.7	30	G-070398	78560	YELLOW CLAY	1221.1389	1191.1389	1056.33
2652780	463210.9	7.5	G-089876I	104918	SILT VERY MOIST BROW	1060.3583	1052.8583	1025.05
2603499	518054.6	19	G-035237	42314	YELLOW CLAY	1190.438	1171.438	1073.87
2658967	488378.3	13	G-082391	91816	CLAY	1072.348	1059.348	1016.29
2644878	468099.3	23	G-127071	154862	3`clay, 17`coarse sa	1063.5118	1040.5118	988.64
2617658	545432.7	84	G-048932	56400	CLAY	1273.4513	1189.4513	1147.86
2616087	502173.6	25	G-126187D	156083	silt w/clay	1162.1257	1137.1257	1055.18
2616067	502162.5	25	G-126187B	156081	silt, w/clay	1162.0845	1137.0845	1055.00
2616278	501877.7	25	G-126187K	156090	clayey silt	1161.2586	1136.2586	1054.54
2640901	483829.5	20	G-098592	115380	Clay	1070.8847	1050.8847	975.52
2598118	528432.5	18	G-042792	50092	YELLOW CLAY	1210.4695	1192.4695	1078.02
2647046	509203.6	5	G-127741	159326	Top soil and clay	1095.0422	1090.0422	1001.42
2616077	502168	25	G-126187C	156082	silt with clay	1162.107	1137.107	1055.09
2645218	460609.7	14	G-086054C	97456	LEAN CLAY	1091.6255	1078.0725	1076.07
2585156	549233.5	20	G-075119	83601	CLAY	1228.0485	1208.0485	1095.50
2612994	530713.8	26	G-066364	74376	YELLOW CLAY	1212.4499	1186.4499	1081.66
2592368	530855.2	23	G-094011	109399	CLAY	1209.102	1186.102	1064.98
2637394	474771.2	22	G-127035	154861	Clay	1104.3763	1082.3763	1010.04
2641545	467809.7	28	G-105906	125990	gray clay & silt	1062.7434	1034.7434	995.14
2616593	476599.5	29	G-059681	67438	GRAY CLAY	1107.0248	1078.0248	1036.43
2631871	540507	28	G-101180	120761	Gray Silty Clay	1191.9899	1163.9899	1074.93
2659231	460996.3	2.5	G-132687G	166296	silty vlay w/fine sa	1050.347	1047.847	960.53
2588113	524692.1	17	G-033607	40636	YELLOW CLAY	1190.8789	1173.8789	1074.26
2653251	495307.3	8	G-080536	89192	SILTY SAND	1075.4	1067.4	1014.96
2587884	524804.3	20.1	G-033607	40635	YELLOW CLAY	1194.8016	1174.7016	1074.88
2612342	514007.5	16	G-135845A	170911	sity clay	1180.438	1164.438	1064.94
2609425	507511.9	15	G-096584	113185	SOIL BROWN CLAY	1171.117	1156.117	1060.03
2651807	523684.2	12	G-022336	28696	FINE SAND AND DIRT	1101.392	1089.392	1019.00
2637883	467587.1	12	G-105953	125457	clay	1070.9349	1058.9349	996.20
2647633	517027.2	17	G-133469	167582	Topsoil and clay	1100.401	1083.401	1009.10
2658249	548650.1	20	G-081660	90576	CLAY	1120.457	1100.457	1030.66
2593465	552796.6	22	G-048064	55521	BLUE CLAY	1244.5838	1222.5838	1084.04
2627937	504594.9	15	G-044312	51659	YELLOW AND BROWN CLA	1146.4533	1131.4533	1050.10
2648897	543107.2	20	G-124396	153899	fine sand	1117.4649	1097.4649	1014.23
2603229	510775.4	20	G-064906	72875	YELLOW CLAY	1180.4787	1160.4787	1050.69

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2598308	514885.8	15	G-128997	159821	15`top soil, clay, 5	1180.4679	1165.4679	1061.79
2647583	514593.6	17	G-127699	159213	Clay	1099.401	1082.401	1011.91
2585803	544520	26	G-053202	60761	CLAY	1224.1583	1198.1583	1065.15
2598696	525023.6	20	G-065987	73985	YELLOW CLAY	1200.48	1180.48	1077.19
2663173	504323	66	G-125697	156438	light gray clay	1191.9686	1125.9686	1043.69
2597762	511903.4	18	G-047077	54506	YELLOW CLAY	1180.47	1162.47	1047.53
2601042	526743.4	17	G-091525	174360	17`top soil, clay, 3	1201.3089	1184.3089	1076.72
2636235	529811	55	G-138258	173731	br. clay	1193.1329	1138.1329	1086.28
2626998	481045	16	G-058774	66478	YELLOW CLAY	1125.9868	1109.9868	1032.72
2652785	463044.9	5	G-089876O	104924	SILT MOIST FIRM PALE	1060.2127	1055.2127	1026.14
2649834	532236.7	7	G-064175	72099	CLAY	1115.9522	1108.9522	1036.32
2608787	518096.3	18	G-040351	47589	YELLOW CLAY	1188.782	1170.782	1060.29
2621506	497706.7	20	G-136422	169688	brown clay	1151.635	1131.635	1053.03
2598336	541604.1	19	G-053429	60992	YELLOW CLAY	1220.507	1201.507	1098.26
2664989	518617.3	76	G-095729	111983	Yellow/Brown Clay	1237.426	1161.426	1119.83
2634932	504630.4	25	G-088662	100692	BLACK CLAY	1090.4356	1065.4356	1038.97
2584678	551472	18	G-135345	166845	brown & gray clay	1229.8471	1211.8471	1105.69
2619206	494905.4	17	G-108319H	128849	silty clay	1150.437	1133.437	1036.51
2616162	502047.2	25	G-126187J	156089	clayey silt	1161.4832	1136.4832	1054.85
2662194	553700.8	15	G-131387	164306	light brown clay	1120.457	1105.457	1028.70
2601249	508781.8	15	G-071362	79524	TOP SOIL CLAY	1173.3328	1158.3328	1043.24
2616152	502041.7	25	G-126187I	156088	clayey silt	1161.4628	1136.4628	1054.76
2612424	541982	65	G-099221	111972	Clay 65' Sand	1289.9386	1224.9386	1090.35
2586294	552666.1	18	G-039551	46764	TOP SOIL CLAY	1232.0956	1214.0956	1100.67
2639785	523855.8	22	G-047016	54445	CLAY TOUGH STICKY GR	1115.0963	1093.0963	1076.25
2643571	535351.6	10	G-110149	132368	clay/top soil	1120.401	1110.401	1052.98
2613567	517457.9	18	G-042325	49612	CLAY	1182.2427	1164.2427	1063.26
2656262	541823.8	8	G-090726D	106063	GRAY SANDY SILT	1115.457	1107.457	1051.55
2613379	506052.6	18	G-033753	40784	CLAY	1170.438	1152.438	1065.69
2616142	502036.2	25	G-126187H	156087	clayey silt	1161.4484	1136.4484	1054.67
2620409	495307.1	24	G-127291G	137214	silty clay	1153.5574	1129.5574	1047.98
2597905	539619.6	15	G-062352	70203	BROWN CLAY	1213.5417	1198.5417	1091.26
2610586	508924.8	15	G-096581	113182	CLAY	1173.7776	1158.7776	1068.50
2599802	485900.5	68	G-074511	82860	YELLOW CLAY	1207.2253	1139.2253	1115.96
2587704	512975.8	18	G-010673	15566	CLAY	1190.471	1172.471	1087.47
2606624	512152.2	18	G-112285A	135247	SILTY CLAY	1180.438	1162.438	1071.96
2609543	520085.1	18	G-060475	68252	BROWN CLAY	1190.3981	1172.3981	1067.41
2596692	507872.7	22	G-058543	66257	YELLOW CLAY	1180.4294	1158.4294	1045.64
2640133	501235.4	24.5	G-108319I	128850	clay	1081.4116	1056.9116	1031.84
2632694	475386	20	G-121796	150182	brown clay	1119.4778	1099.4778	1023.84
2645380	504893.7	5	G-107434	128153	Dark Brown Clay	1090.401	1085.401	1015.30
2642427	474359.3	23	G-132249	163752	Blue Clay	1068.1343	1045.1343	1011.58
2640398	478401	27	G-117227	142687	gray clay	1070.348	1043.348	1009.72
2606584	512046.7	18	G-112285C	135249	SILTY CLAY	1180.438	1162.438	1072.28
2599851	538963.6	17	G-096433	111976	2' Clay, Medium Sand	1213.4685	1196.4685	1092.03
2599880	535157.2	18	G-035753	42855	YELLOW CLAY	1210.9497	1192.9497	1084.67
2612785	513083.9	16	G-135845C	170913	sandy silty sand	1178.4528	1162.4528	1066.06
2648203	495778.6	15	G-021194	27484	FINE SOIL	1080.4	1065.4	992.09
2635332	478018.7	19	G-093915	109702	LIGHT BROWN CLAY	1117.1635	1098.1635	1015.93
2632824	517709.9	47	G-139140	170351	Clay	1208.0278	1161.0278	1026.55
2629416	502905.3	16	G-036098	43211	BROWN CLAY	1140.437	1124.437	1046.13
2612237	518747.5	15	G-064207	72149	CLAY	1180.6967	1165.6967	1063.05
2630732	486524.1	15	G-057498	65174	BROWN CLAY	1131.6515	1116.6515	1035.45
2626825	497476	19	G-127291C	137210	clayey silt	1150.1238	1131.1238	1041.63
2616732	520942.2	12	G-057184	64848	GRAY CLAY	1173.6961	1161.6961	1072.79
2660414	485788.7	11	G-088059	100048	SILTY CLAY DARK BROW	1072.348	1061.348	1016.26
2606601	526526.4	15	G-111907	134780	TAN CLAY	1200.438	1185.438	1083.15
2657873	497613.3	8	G-124180	153630	silt with sand lens	1080.4	1072.4	1030.48
2630786	500386	15	G-028139	34854	CLAY	1134.4442	1119.4442	1047.24
2617221	478589.4	18.1	G-030678	37578	YELLOW AND GRAY CLAY	1094.5156	1076.4156	1029.43
2596862	532933.9	16	G-056090	63707	YELLOW CLAY	1210.3151	1194.3151	1097.74
2640635	497894.8	16	G-126644	157888	BROWN AND GRAY CLAY	1081.158	1065.158	1027.35
2622002	474004.6	10	G-062530B	70394	BROWN CLAY	1090.8795	1080.8795	1046.40
2607616	529265	15	G-076196	84690	LEAN CLAY LIGHT GRAY	1196.4399	1181.4399	1085.00

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2645252	461426.3	9	G-086054B	97455	LEAN CLAY W/ SILT	1075.2445	1065.9902	1063.99
2657817	529947.9	10	G-058058	65752	CLAY	1106.0851	1096.0851	1051.90
2622308	509882.9	17	G-101556	119755	clay, brown-gray bro	1168.658	1151.658	1059.91
2593797	530097	20	G-115367	139549	yellow clay	1210.471	1190.471	1070.05
2626818	545846.9	35	G-051683	59221	CLAY	1187.9255	1152.9255	1107.51
2616041	502201.2	25	G-126187L	156091	clayey silt	1162.5733	1137.5733	1055.07
2648402	472601.7	5	G-076589	85154	SILTY SAND CLAY AT S	1062.999	1057.999	984.05
2655460	552313.1	15	G-000690	4016	TOPSOIL AND CLAY	1120.457	1105.457	1033.74
2599552	505296.2	16	G-067472	75535	YELLOW CLAY	1170.47	1154.47	1068.88
2660659	480471.7	20	G-041584	48849	CLAY	1062.348	1042.348	1008.22
2608224	520081.6	17	G-060476	68254	YELLOW CLAY	1191.4159	1174.4159	1072.01
2603347	531038.9	18	G-046552	53968	YELLOW CLAY	1210.9388	1192.9388	1078.16
2641391	515996.3	11	G-047830	55286	BLUE CLAY	1100.401	1089.401	1038.29
2623023	489506.6	17	G-077970	86633	BROWN CLAY	1140.453	1123.453	1042.97
2602590	536411.8	17	G-046551	53967	YELLOW CLAY	1210.8172	1193.8172	1083.73
2638290	462980.8	19	G-053629	61192	CLAY	1085.5601	1066.5601	992.13
2628402	540302.9	65	G-105130	124768	brown clay	1221.781	1156.781	1081.94
2629999	504936.5	15	G-046472	53886	YELLOW CLAY	1143.4325	1128.4325	1047.25
2604918	506540.5	16	G-096582	113183	YELLOW CLAY	1173.5826	1157.5826	1039.98
2657086	488362.4	10	G-109425	130829	silty clay	1073.1222	1063.1222	1021.54
2644102	539925.3	8	G-065978	73976	CLAY	1121.9847	1113.9847	1048.75
2641514	481601.6	20	G-050177	57678	CLAY	1070.348	1050.348	991.39
2588175	541341.4	15	G-100517	118269	clay	1214.6762	1199.6762	1087.59
2608143	483511.4	18	G-063202	71102	CLAY	1108.3433	1090.3433	1061.47
2656443	492830.1	7	G-110225	132587	clay, brown, silt, d	1075.5645	1068.5645	1021.91
2625588	478978.4	21.5	G-131282A	164110	sandy silty clay	1124.2365	1102.7365	1032.70
2638305	499293.9	15	G-047358	54797	BLUE CLAY	1080.4259	1065.4259	1030.09
2649368	482242.9	16	G-122122	150595	gray clay	1070.348	1054.348	1017.02
2654849	519217	9	G-015211	20787	SANDY LOAM	1104.4014	1095.4014	1050.68
2598547	509986.6	17	G-037637	44795	YELLOW CLAY	1178.9805	1161.9805	1046.88
2636477	529519.3	58	G-127393	158869	light brown clay	1192.1619	1134.1619	1085.12
2606875	529872	21	G-082411A	91882	SILT	1200.4444	1179.4444	1082.90
2588339	548565.4	17	G-054356	61939	CLAY	1229.6431	1212.6431	1081.42
2659306	551006.1	22	G-017694	23622	GRAY CLAY	1128.4394	1106.4394	1038.17
2650979	557536.5	18.5	G-086282	97743	TOPSOIL AND CLAY	1134.8417	1116.3417	1055.72
2588696	550650	16	G-135893	170798	topsoil to clay	1231.51	1215.51	1090.39
2595398	517865.8	20	G-070210	78376	CLAY	1190.471	1170.471	1071.14
2612829	512579.3	17	G-135845B	170912	sandy silty clay	1178.3179	1161.3179	1066.61
2612233	504914.6	18	G-033753	116317	Topsoil & Clay 2' Sa	1170.438	1152.438	1046.84
2641545	543766	10	G-059358D	67084	SILTY CLAY	1125.457	1115.457	1057.60
2598459	538277.9	18.1	G-015644	21291	YELLOW CLAY	1216.7405	1198.6405	1087.76
2608883	523412	20	G-035976	43086	BROWN SANDY CLAY	1196.7383	1176.7383	1067.59
2647711	513383.8	14	G-127514	159031	Top soil and clay	1098.401	1084.401	1006.33
2640559	502908.4	20	G-127291I	137216	clay, brown	1079.4579	1059.4579	1032.25
2608048	535357.3	20	G-037678	44837	YELLOW CLAY	1210.5336	1190.5336	1082.44
2605005	486102.4	30	G-057633	65312	Clay	1131.7136	1101.7136	1079.18
2622920	497304.1	20	G-108319E	128846	clayey silt	1150.2621	1130.2621	1049.67
2622920	497304.1	20	G-127291E	137212	clayey silt	1150.2621	1130.2621	1049.67
2601807	510731.7	17	G-049256	56737	YELLOW CLAY	1179.33	1162.33	1047.57
2658585	543213.3	11	G-050796	58316	GRAY AND BLUE CLAY	1113.6482	1102.6482	1052.46
2658009	496231.1	11	G-085814	97178	GRAY CLAY	1080.4	1069.4	1026.59
2643725	547822.7	13	G-054297	61879	TOPSOIL AND SILT	1130.457	1117.457	1060.48
2639386	484836.2	18	G-047789	55242	YELLOW CLAY	1070.8032	1052.8032	984.50
2635001	531886.8	60	G-122799	151474	brown clay	1206.1668	1146.1668	1091.09
2658404	501520.1	14	G-041786	49065	TOP & CLAY	1087.2966	1073.2966	1050.62
2660764	558114.7	15	G-074621	82970	FINE SAND	1122.457	1107.457	1034.85
2597411	517229.4	17	G-058723	66423	CLAY	1190.471	1173.471	1077.63
2599994	518611.3	14	G-087076	98823	TOP SOIL AND CLAY	1190.471	1176.471	1073.19
2594627	536214.8	20	G-060916	68706	CLAY	1220.507	1200.507	1081.64
2650858	522400.7	12	G-102608	121114	blue, brown clay	1103.3918	1091.3918	1005.19
2657808	498845.6	6	G-079184	87846	DARK BROWN CLAY	1081.3892	1075.3892	1035.91
2596382	544833.2	18	G-065856	73849	GRAY CLAY	1228.451	1210.451	1090.60
2650859	522395.6	12	G-101822A	119935	Sandy Brown Clay	1103.3919	1091.3919	1005.23
2632495	509006.5	25	G-049439	56923	YELLOW CLAY	1154.8651	1129.8651	1038.46

Table 2-1
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2648025	491524	9	G-128091	159648	Clay	1078.3591	1069.3591	985.03
2591981	538754.1	16	G-071506	79668	CLAY	1220.507	1204.507	1094.26
2657777	485695.5	9	G-088058	100047	SILTY CLAY DARK BROW	1072.348	1063.348	1018.64
2663279	483839.8	16	G-136010	140312	brown clay	1072.348	1056.348	968.98
2597353	536303.8	18	G-046830	54253	YELLOW CLAY	1218.101	1200.101	1086.43
2588800	516258.3	17	G-136275	170959	top soil/brown clay	1191.4369	1174.4369	1082.03
2650859	522390.5	12	G-101822B	119936	Sandy Brown Clay	1103.3919	1091.3919	1005.27
2597521	479180.3	40	G-088853	100924	CLAY	1218.5545	1178.5545	1138.08
2622725	505249.6	14	G-105802	125878	14' clay into 6' med	1162.4339	1148.4339	1043.89
2627304	521421.6	35	G-096904	113075	Clay	1232.1737	1197.1737	1033.88
2625090	510731.1	18	G-136423	169848	clay	1160.4646	1142.4646	1074.05
2650859	522385.7	12	G-101822C	119937	Sandy Brown Clay	1103.3919	1091.3919	1005.31
2607910	527879.2	10	G-060417	68196	YELLOW CLAY	1192.7667	1182.7667	1087.28
2594458	544096.5	20	G-120841	146187	Topsoil, clay	1229.1468	1209.1468	1086.85
2665396	477581.7	55	G-117114	142479	light brown clay	1129.9722	1074.9722	1062.73
2616050	502206.7	25	G-126187N	156093	clayey silt	1162.6624	1137.6624	1055.16
2614205	520797.5	17	G-138821	170711	17`top soil,clay, 3`	1188.6091	1171.6091	1066.54
2626916	497474.6	19	G-108319C	128844	clayey silt	1150.4514	1131.4514	1041.56
2645274	542186.4	12	G-082283	91626	FINE SAND	1126.1841	1114.1841	1041.46
2666513	537691.3	8	G-088403	100420	LIGHT BROWN CLAY	1110.5202	1102.5202	1063.62
2653310	555870.7	15	G-075904	84397	FAT CLAY HARD BLACK	1130.457	1115.457	1045.82
2594338	525421.7	19	G-037726	44886	YELLOW CLAY	1200.852	1181.852	1071.33
2602747	533823	18	G-035207	42283	YELLOW CLAY	1210.4388	1192.4388	1077.90
2642895	480344.4	18	G-047357	54796	BLUE CLAY	1070.348	1052.348	1001.79
2641165	484640.9	20	G-105933	125461	clay	1070.488	1050.488	978.97
2658832	491033.6	10	G-081652	90565	CLAY	1073.4019	1063.4019	1020.10
2632968	516292.7	38	G-078377	87040	CLAY	1174.6303	1136.6303	1026.58
2596781	509910	16	G-053471	61034	BROWN CLAY	1179.8206	1163.8206	1051.97
2658928	552947.3	20	G-100441	118229	Clay	1128.2049	1108.2049	1042.20
2608866	529287.4	19	G-037677	44836	YELLOW CLAY	1200.4077	1181.4077	1085.64
2606584	512246.5	18	G-112285B	135248	SILTY CLAY	1180.438	1162.438	1072.17
2660838	489060.8	10	G-081653	90566	CLAY	1072.348	1062.348	1013.83
2596159	515890.8	18	G-060987	68796	YELLOW CLAY	1190.4184	1172.4184	1074.47
2619688	474325.7	15	G-018747	24795	FINE SAND	1104.4902	1089.4902	1046.61
2637011	532214.7	45	G-106148	126175	brown & yellow clay	1229.9554	1184.9554	1097.99
2605845	500782.6	18	G-033751	40782	YELLOW CLAY	1160.437	1142.437	1039.07
2661467	552294.5	12	G-050988	58513	CLAY	1122.1723	1110.1723	1037.01
2608858	520742.5	15	G-065681	73672	CLAY	1190.438	1175.438	1070.48
2600716	524443.9	17	G-023385	29812	YELLOW CLAY	1200.2299	1183.2299	1075.57
2586889	530640.6	14	G-135395	169739	clay	1210.4521	1196.4521	1105.25
2614022	523422.8	18	G-048425B	158572	Clay	1187.2669	1169.2669	1065.78
2595861	509939.7	19	G-035273	42355	YELLOW CLAY	1179.4341	1160.4341	1056.75
2613732	499752	18	G-033747	40778	SILT CLAYEY	1162.2257	1144.2257	1026.60
2629593	497115.2	15	G-127291B	137209	clay brown	1142.5123	1127.5123	1043.62
2586656	535880.9	15	G-072063	80226	YELLOW CLAY	1212.9209	1197.9209	1159.01
2639705	477241.2	16	G-132237	157114	Soft Sticky Gray Cla	1070.3479	1054.3479	1011.36
2654596	541733.3	5.5	G-090726C	106062	DARK GRAY SANDY SILT	1118.4635	1112.9635	1044.96
2610763	522725	20	G-065871	73866	YELLOW CLAY	1194.4035	1174.4035	1058.17
2635292	481943.7	25	G-101460	118972	Light Brown Clay	1098.4763	1073.4763	1000.24
2640455	488890.6	20	G-105896	125980	gray clay	1080.3471	1060.3471	993.87
2637987	531351.5	15	G-092071	107211	BROWN CLAY	1170.1849	1155.1849	1093.86
2633591	490613.3	15	G-121798	150184	brown clay	1110.8671	1095.8671	1032.71
2619817	510500.9	19	G-033748	40779	YELLOW CLAY	1173.7383	1154.7383	1054.62
2618123	499787.7	17	G-036214	43337	YELLOW CLAY	1160.437	1143.437	1047.25
2666998	530794.7	89	G-095862	112096	Brown Clay	1273.8259	1184.8259	1060.06
2608683	497014.2	22	G-096587	113191	Brown Clay	1161.9697	1139.9697	1038.78
2638710	472598.5	15	G-134247	168423	brown clay	1099.8046	1084.8046	1014.59
2665629	505946.8	63	G-131386	164304	light gray clay	1230.3446	1167.3446	1077.04
2641794	492172.4	10	G-128147	159166	clay	1080.3978	1070.3978	997.37
2597949	520804.2	18	G-008876	13478	CLAY	1191.4992	1173.4992	1070.36
2593461	554116.1	22	G-048014	55471	GRAY CLAY	1252.0587	1230.0587	1071.47
2606672	526507.4	15	G-111906	134779	LIGHT BROWN CLAY	1200.438	1185.438	1083.34
2666102	541937	13	G-091118	104104	DARK BROWN CLAY	1117.4363	1104.4363	1074.11
2596053	524934.7	17	G-047089	54518	YELLOW CLAY	1200.471	1183.471	1074.93

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2627640	548997.6	85	G-117225	142683	medium brown clay	1243.1424	1158.1424	1089.65
2595222	494610.9	14	G-135565	170113	Yellow clay	1156.9132	1142.9132	1067.76
2591136	537381.3	18	G-115119	139459	yellow clay	1219.5165	1201.5165	1102.36
2646418	469230.1	12	G-113882	136179	12' TOPSOIL & CLAY,	1062.204	1050.204	995.66
2630380	510943.1	21	G-048297	55757	GRAY CLAY	1158.4724	1137.4724	1044.02
2589818	510466.4	21	G-056690	64332	YELLOW CLAY	1187.3486	1166.3486	1078.35
2643624	494234.7	11	G-100706	118457	silty clay	1080.4	1069.4	993.53
2586002	512519.4	18	G-104085	123697	clay	1192.2778	1174.2778	1091.09
2603020	514751.4	17	G-057315	64984	YELLOW CLAY	1187.0817	1170.0817	1075.16
2608603	531249.3	17.5	G-020313	26529	GRAY CLAY	1204.5585	1187.0585	1082.63
2607046	529877.5	15	G-076188	84682	LEAN CLAY GRASY MOTT	1200.4539	1185.4539	1083.12
2658047	495572.5	10	G-061620	69456	CLAY	1080.4	1070.4	1025.86
2592558	528251.2	17	G-072123	80286	YELLOW CLAY	1203.4678	1186.4678	1067.66
2643845	475800.7	15	G-110548	133059	Blue clay	1068.4565	1053.4565	1013.31
2649680	537334.8	3.1	G-082635	92271	SILTY BROWN CLAY	1120.4235	1117.3235	1056.03
2658939	547943.9	17	G-102604	121101	Dark Gray Clay	1120.457	1103.457	1030.25
2659783	474253.2	21	G-094022	103937	BROWN SILT	1060.3053	1039.3053	1016.56
2605251	539160.2	23	G-052189	59742	CLAY	1243.9862	1220.9862	1105.11
2605250	523439.6	15	G-109009	130780	light tan clay	1193.4511	1178.4511	1071.62
2630733	501664.5	15	G-028138	34853	CLAY	1136.4383	1121.4383	1046.52
2621650	471889.4	15	G-117775	143392	yellow clay	1120.5298	1105.5298	1060.93
2632646	461814.4	38	G-127389	158868	tan clay	1116.9297	1078.9297	1017.26
2587227	528095	15	G-071585	79747	CLAY	1207.5019	1192.5019	1086.65
2631741	517744.5	40	G-109356	131120	GRAY CLAY	1215.5538	1175.5538	1031.97
2623523	539623.9	53	G-096299	111979	8' Clay, 7' Sand & F	1240.2704	1187.2704	1099.76
2586797	522137.5	15	G-062411	70267	BROWN CLAY	1202.4698	1187.4698	1079.49
2623185	493275.8	12	G-098490	115077	Silty, Clay, Red-Bro	1143.0302	1131.0302	1042.91
2599734	502608.4	18	G-000350	3620	YELLOW CLAY	1168.537	1150.537	1053.11
2660584	530339.3	5	G-050878	58399	TOPSOIL CLAY	1102.3937	1097.3937	1059.24
2597944	523229.3	16	G-091614	104851	CLAY	1200.0325	1184.0325	1078.70
2658142	477739.4	16	G-052563	60120	CLAY	1062.348	1046.348	1021.90
2668535	475071	15	G-099973	117338	light brown clay	1186.7339	1171.7339	1080.19
2596060	522439.3	16	G-053273	60835	YELLOW CLAY	1196.894	1180.894	1072.97
2628831	515020	33	G-107189	127829	reddish brown clay	1200.1519	1167.1519	1029.65
2599120	462891.2	35	G-088279	100287	BROWN CLAY	1264.4188	1229.4188	1166.81
2660041	508906.9	12	G-056513	64148	BLACK LOAM TOPSOIL G	1097.3991	1085.3991	1043.24
2585260	550195	17	G-136134	170502	brown clay	1230.2763	1213.2763	1098.62
2640692	483550.6	19	G-105898	125982	gray clay	1071.3614	1052.3614	974.86
2661046	500312.1	17	G-009033	13661	CLAY	1088.5487	1071.5487	1038.20
2626450	488539.4	10	G-084699	95497	SILTY CLAY/CLAYEY SI	1140.453	1130.453	1040.58
2638881	504548.8	15	G-109089	130740	blue clay	1070.399	1055.399	1036.92
2633231	490577.4	17	G-053658	61222	BROWN CLAY	1116.8075	1099.8075	1033.00
2621695	501434.2	10	G-096590	113198	BROWN CLAY	1156.8423	1146.8423	1051.69
2618596	476047.4	12	G-048035	55492	CLAY	1096.5977	1084.5977	1032.59
2618596	476047.4	12	G-048035	169011	Clay	1096.5977	1084.5977	1032.59
2635341	503188.2	17	G-014821	20347	BLUE CLAY	1088.4761	1071.4761	1039.89
2628402	540312.8	65	G-105129	124767	brown clay	1221.9284	1156.9284	1082.00
2592859	515723.3	18	G-013220	18508	CLAY	1185.9247	1167.9247	1073.06
2616060	502212.2	25	G-126187M	156092	clayey silt	1162.7992	1137.7992	1055.25
2639440	494276.3	10	G-109003	130465	gray clay	1080.4	1070.4	1021.48
2655802	464481.8	10	G-109464L	131242	grey to black clay w	1057.3628	1047.3628	994.42
2637989	519189.3	28	G-130797	159820	Clay	1148.4367	1120.4367	1042.63
2651936	483456.4	5	G-052786	60343	BROWN CLAY	1067.8258	1062.8258	1030.25
2611047	530993.2	18.1	G-037636	44794	YELLOW CLAY	1206.7825	1188.6825	1082.97
2659233	498922.6	9	G-079185	87847	DARK BROWN CLAY	1084.4007	1075.4007	1034.89
2638853	504527.5	15	G-109088	130739	blue clay	1070.4212	1055.4212	1036.97
2646092	467269.6	16	G-066614	74635	TAN CLAY	1065.0469	1049.0469	986.79
2657610	504779.3	5	G-050151	57652	CLAY	1090.4004	1085.4004	1033.20
2655264	527177.3	6	G-050879	58401	TOPSOIL SANDY CLAY	1106.4035	1100.4035	1045.90
2609983	476892.6	20	G-102944	121579	yellow clay	1151.3233	1131.3233	1071.13
2620046	507873.2	12	G-054655	132304	Topsoil & Clay	1170.438	1158.438	1055.66
2630813	500317.5	15	G-087283	99112	TOP SOIL AND CLAY	1134.4379	1119.4379	1047.24
2663065	542699.3	15	G-092506	107838	DARK GRAY CLAY	1110.457	1095.457	1067.34
2611950	526043.1	16	G-051927	59472	CLAY	1190.6266	1174.6266	1073.22

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2634993	495029.4	19.5	G-097847K	114676	Blue-Gray Clay	1068.0361	1048.5361	1035.25
2664351	498296.3	40	G-134895	169405	Dark brown clay	1162.2545	1122.2545	1007.46
2662391	546050.3	17	G-050989	58514	BLUE CLAY	1113.4617	1096.4617	1052.39
2607359	522562.2	18	G-098488	115075	Silty Clay, Yellow B	1196.4402	1178.4402	1069.84
2614308	515515.3	15	G-065684	73675	CLAY	1188.7523	1173.7523	1062.90
2657126	494855.7	8	G-093659	109265	DARK BROWN CLAY	1080.4	1072.4	1027.10
2590137	524023.8	18.1	G-033505	40531	YELLOW CLAY	1191.4963	1173.3963	1070.72
2664229	508216.8	40	G-127603	159181	dk brown clay	1233.238	1193.238	1053.54
2654791	478245.3	6	G-061009	68825	SANDY CLAY	1067.3489	1061.3489	1025.31
2622683	483847.5	19	G-035213	42290	YELLOW CLAY	1137.4352	1118.4352	1032.11
2618650	493174.6	17	G-098489	115076	Yellow-Brown Silty C	1150.437	1133.437	1031.94
2621976	496151.1	15	G-127291D	137211	clay - yellow brown	1150.437	1135.437	1052.15
2646202	509270.2	5	G-127740	159325	Top soil and clay	1098.1162	1093.1162	1004.57
2617285	504943.7	14	G-105801	125877	14' clay into 6' med	1169.099	1155.099	1062.35
2610553	479665.9	17	G-070581	78743	YELLOW CLAY	1136.4967	1119.4967	1054.75
2666312	537303.5	8	G-090524	105779	LIGHT BROWN CLAY	1110.401	1102.401	1066.03
2631579	481916.7	10	G-051860	59402	CLAY	1127.9261	1117.9261	1029.35
2653365	470382.9	8	G-122717	151372	sandy clay	1060.348	1052.348	990.15
2647311	557235.9	4	G-054892	62488	SILTY CLAY LOAM	1133.4481	1129.4481	1066.57
2619262	494537.3	15	G-127291H	137215	clay, brown	1150.437	1135.437	1039.63
2656541	528562.6	4	G-065908	73905	CLAY	1105.7172	1101.7172	1049.42
2629577	497335	9	G-108319B	128843	clayey silt	1137.0218	1128.0218	1042.26
2609160	510252.4	12	G-033749	132307	Topsoil & Clay	1180.438	1168.438	1069.96
2661194	533428	15	G-017656	23578	TOPSOIL AND CLAY	1110.401	1095.401	1058.96
2586284	501723.4	14	G-087555	99428	BROWN CLAY	1148.6771	1134.6771	1075.96
2604342	525181	15	G-099462	117019	clay	1200.4379	1185.4379	1075.23
2628212	485527.6	14	G-129323B	161444	light brown, moist,	1138.5801	1124.5801	1032.87
2626758	493346.4	12	G-098491	115078	Brown, Silty Clay	1144.7309	1132.7309	1046.05
2650941	484651.5	6	G-102451	120558	clay layer	1070.348	1064.348	1006.13
2630238	498343.6	13	G-052170	59723	BROWN CLAY	1130.4373	1117.4373	1044.13
2644201	534027.5	6	G-093052	108457	BLACK CLAY	1120.138	1114.138	1057.50
2652691	463196.9	6	G-089876G	104916	SILTY CLAY MOIST FIR	1060.2571	1054.2571	1025.08
2607007	529916.4	15	G-076174	84668	LEAN CLAY GREENISH G	1200.4625	1185.4625	1083.01
2589745	526289.4	17	G-090605	150134	Clay	1193.452	1176.452	1068.96
2615223	477870.3	15	G-046970	54398	CLAY	1102.2272	1087.2272	1036.94
2625120	525947.8	50	G-069208	77350	CLAY	1255.401	1205.401	1068.46
2610545	528000.9	20	G-076735	85302	CLAY	1199.141	1179.141	1084.28
2639807	472037.9	20	G-123375	152369	brown clay	1091.2183	1071.2183	1015.38
2592956	548170.9	16	G-052390	59945	GRAY CLAY	1230.507	1214.507	1090.74
2634273	517886	45	G-084917	95917	CLAY	1177.3422	1132.3422	1024.27
2652942	549534.3	11	G-054293	61875	SILTY SAND	1125.456	1114.456	1047.76
2668925	489995.6	50	G-093462	108764	LIGHT BROWN CLAY	1240.9529	1190.9529	928.56
2624230	482238.1	12	G-051787	59328	CLAY	1134.8418	1122.8418	1030.08
2634970	513113.9	19	G-068383	76467	CLAY	1142.6011	1123.6011	1045.99
2655553	465071.6	10	G-109464K	131241	clay	1059.3835	1049.3835	990.29
2623012	522375.2	15	G-129442	161514	Clay	1224.734	1209.734	1067.35
2606138	518093.1	15	G-065682	73673	CLAY	1197.5877	1182.5877	1062.96
2624905	467126.6	25	G-093301	108789	GRAYISH CLAY	1157.1587	1132.1587	1058.07
2636846	476874.9	20	G-132238	165613	Soft Brown Clay	1109.8679	1089.8679	1012.53
2635905	495672.1	19	G-136409	169694	Top soil & clay	1086.5688	1067.5688	1040.48
2656633	525900.4	5	G-064243	72185	CLAY	1102.6063	1097.6063	1049.56
2650960	552623.8	5.3	G-083073	92929	BROWN SANDY CLAY	1130.4444	1125.1444	1047.54
2610561	479696.5	17	G-070581	124740	Clay	1136.4858	1119.4858	1054.59
2633419	485275.9	15	G-053801	61375	CLAY	1129.2656	1114.2656	1010.60
2655873	470894.8	10	G-127725	159105	brown clay	1060.3342	1050.3342	1001.21
2608043	499498.3	20	G-100739	118612	Stiff, Lt Brown, Low	1152.0238	1132.0238	1006.36
2637762	529876	54	G-122568	151153	light brown clay	1180.0055	1126.0055	1094.36
2663120	483261.7	16	G-089306	101558	SILTY GRAY	1072.348	1056.348	973.53
2647052	546977.4	12	G-123715	152831	light gray clay	1130.457	1118.457	1056.31
2643532	531729.1	12	G-112950	136249	DARK GRAY CLAY	1120.3745	1108.3745	1062.50
2633108	511056.9	15	G-114521	137609	brown clay	1149.4642	1134.4642	1042.63
2626343	505454.7	12	G-033752	40783	GRAY CLAY	1158.7343	1146.7343	1063.07
2656310	539743.8	7.5	G-090726E	106064	GRAY SANDY SILT	1115.457	1107.957	1062.03
2646130	509165.8	6	G-127739	159324	Top soil and clay	1098.447	1092.447	1004.75

Table 2-1
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Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2608725	499912.9	24	G-097847C	114656	Sandy Clay	1170.1042	1146.1042	1019.02
2597927	528135.6	18	G-127250	157787	4`top soil, 14`brown	1211.2449	1193.2449	1077.54
2664804	469959.8	25	G-137471	172694	light brown clay	1164.8416	1139.8416	1109.99
2663009	520209.1	70	G-091074	106534	LIGHT BROWN CLAY	1230.7375	1160.7375	1100.83
2604941	531839.2	15	G-051686	59224	YELLOW CLAY	1211.4274	1196.4274	1078.56
2664785	476811.7	30	G-090568	105695	LIGHT BROWN CLAY	1094.6734	1064.6734	1044.51
2611240	495610.6	13	G-054654	62244	BROWN CLAY	1160.437	1147.437	1024.69
2596796	506557.3	12	G-059115	66830	YELLOW CLAY	1174.5368	1162.5368	1041.62
2659538	513492.8	5	G-011280	16269	CLAY	1097.8258	1092.8258	1036.43
2666421	503311.6	50	G-107303	128020	LIGHT GRAY CLAY	1197.1735	1147.1735	1067.43
2647925	517342.4	17	G-133500	167584	Topsoil and clay	1100.9253	1083.9253	1009.04
2635434	477973.4	19	G-093916	109703	LIGHT BROWN CLAY	1117.5128	1098.5128	1015.68
2608827	516828.6	18	G-136279	169003	yellow clay	1189.8608	1171.8608	1059.92
2633280	521723.1	36	G-058958	66668	BROWN CLAY	1191.0964	1155.0964	1051.07
2642253	460266.4	10	G-138488D	174140	clay, silty, light b	1071.521	1061.521	1045.09
2657631	508641.4	10	G-135038	169458	gray clay	1090.9915	1080.9915	1026.59
2621284	553501.5	45	G-022518	28893	YELLOW CLAY	1274.0393	1229.0393	1014.04
2588888	509759.3	18	G-010674	15567	CLAY	1185.4405	1167.4405	1075.60
2636031	495264.2	16	G-097847I	114672	Blue-Gray Clay	1080.8917	1064.8917	1036.98
2650380	542359	13	G-120070	147565	dark brown clay	1122.9753	1109.9753	1018.30
2664844	550157.7	9	G-062103	69940	CLAY	1129.4697	1120.4697	1043.75
2665694	504430.5	40	G-136539	171450	light brown clay	1220.9593	1180.9593	1066.68
2655857	464359	8	G-109464M	131243	brown clay	1056.8341	1048.8341	995.12
2657841	518702.5	97	G-084290	94787	LIGHT BROWN CLAY	1213.2498	1116.2498	1076.48
2651158	543810	10	G-119229	145807	LIGHT BROWN CLAY	1130.5393	1120.5393	1018.34
2664331	509436.4	80	G-134224	168411	light brown clay	1275.8422	1195.8422	1048.68
2653201	465471.6	10	G-105910	125994	dry sand	1069.7333	1059.7333	973.85
2669207	488948.3	65	G-089152	101246	LIGHT BROWN CLAY	1273.1728	1208.1728	958.96
2620368	531322.7	45	G-105923	125474	clay	1264.9544	1219.9544	1063.59
2647954	531116.3	6	G-124651	154231	slty clay drk brwn-b	1117.4236	1111.4236	1032.63
2663133	510599.1	25	G-116412	141316	light brown clay	1201.3518	1176.3518	1033.84
2590479	545154.3	15	G-089241	101491	LIGHT BROWN CLAY	1238.0579	1223.0579	1075.10
2662563	511929.7	46	G-081447	90209	YELLOW TILL	1200.0239	1154.0239	1031.91
2589912	484135.7	25	G-105776	125443	clay	1262.4157	1237.4157	1166.61
2663894	470897.5	45	G-093759	109543	LIGHT BROWN CLAY	1191.94	1146.94	1076.45
2661498	525608.1	5	G-104810	122734	sandy clay	1101.3702	1096.3702	1056.97
2665855	468864.8	63	G-094500	110152	BROWN CLAY	1225.3526	1162.3526	1122.40
2638171	515068.7	12	G-111009	133842	CLAY	1100.8485	1088.8485	1027.41
2658175	551148.3	15	G-058233	65932	BROWN CLAY	1126.2439	1111.2439	1035.67
2668014	489222.3	70	G-092687	108001	LIGHT BROWN CLAY	1281.4492	1211.4492	956.13
2657839	537932.1	6	G-090726I	106081	LIGHT GRAY BROWN CLA	1111.2203	1105.2203	1069.54
2660445	549166.9	13	G-092765	107899	CLAY	1120.457	1107.457	1036.54
2651993	545863	12	G-083790	93943	CLAY	1121.4663	1109.4663	1023.84
2667270	514764.8	74	G-107804	128194	light gray clay	1286.641	1212.641	1087.68
2652321	464389.7	5	G-089876M	104922	SANDY SILTY CLAY MOI	1060.3675	1055.3675	1005.60
2592944	505359.3	15	G-053764	61336	BROWN CLAY	1171.2377	1156.2377	1058.04
2668714	497779	33	G-089253	101503	LOESS	1239.7913	1206.7913	1076.48
2665895	506869.7	80	G-138415	173984	Brown clay	1267.061	1187.061	1081.18
2607156	529702.3	14.5	G-076189	84683	LEAN CLAY GRAY MORE	1201.1251	1186.6251	1083.50
2651211	547430.2	24	G-084775	95843	LIGHT GRAY CLAY	1127.0582	1103.0582	1029.00
2639857	491748	16.5	G-116922D	142210	reddish brown silty	1080.3842	1063.8842	1008.69
2625214	507985.4	16	G-129063	160959	16`top soil, clay, 4	1161.455	1145.455	1070.73
2652323	464385.8	5	G-089876C	104912	SANDY SILTY CLAY	1060.3399	1055.3399	1005.66
2632552	496615.4	10	G-127291A	137208	clay - brown	1098.9248	1088.9248	1041.71
2628135	485524.5	12	G-129323F	161447	light brown, moist,	1136.3803	1124.3803	1032.84
2668364	482283.8	20	G-106887	127165	light brown clay	1237.3696	1217.3696	988.94
2599803	484547.7	65	G-072863	81051	YELLOW CLAY	1226.9512	1161.9512	1122.79
2593716	467752.6	18	G-097299	113047	Clay	1270.5513	1252.5513	1194.79
2665986	504746.9	53	G-125812	156434	light brown clay	1236.3568	1183.3568	1078.89
2657350	496198.2	11	G-085815	97179	CLAY	1080.4	1069.4	1027.63
2669008	489149.7	70	G-089690	104575	LIGHT BROWN CLAY	1278.5258	1208.5258	950.73
2652808	463149.8	6	G-089876J	104919	SILTY CLAY VERY MOIS	1060.3429	1054.3429	1025.53
2598696	475276	30	G-085604	96886	CLAY	1239.695	1209.695	1135.27
2667310	533531.2	83	G-082948	92642	LIGHT GRAY CLAY	1255.3877	1172.3877	1041.63

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2654578	532011.5	7	G-094642	109951	Gray Clay	1110.401	1103.401	1051.79
2642393	460270.1	9	G-130942E	163459	clay, silty, dark br	1070.4734	1061.4734	1046.30
2599167	528472.6	15	G-073751	82087	TOP SOIL AND CLAY	1209.8902	1194.8902	1077.87
2642523	503339.6	10	G-105467	124222	brown & gray clay	1089.3833	1079.3833	1027.09
2667934	467058.3	60	G-102911	121446	brown clay	1228.5983	1168.5983	1121.30
2595874	527567.5	10	G-062375	70226	YELLOW CLAY	1200.471	1190.471	1074.25
2648016	513396.7	5	G-127516	159033	Top soil and clay	1098.401	1093.401	1004.85
2637482	514674.1	20	G-126288	157294	brown clay	1139.6986	1119.6986	1026.94
2666374	497295.1	95	G-107901	128750	LIGHT GRAY CLAY	1210.4945	1115.4945	1008.86
2662457	503178.2	18	G-130357	162617	tan clay	1113.5049	1095.5049	1043.83
2590041	517726.3	15	G-040328	47566	YELLOW SOIL	1181.7149	1166.7149	1079.05
2668380	507787.2	80	G-129154	161109	light brown clay	1287.7691	1207.7691	1038.92
2646668	498251.6	20	G-135895	169693	Fine gravel & coarse	1081.3946	1061.3946	992.12
2668350	489614.1	65	G-085969	96437	LIGHT BROWN CLAY	1276.8787	1211.8787	954.66
2665986	474567.9	57	G-114279	138068	LIGHT BROWN CLAY	1182.898	1125.898	1066.10
2615762	510836.2	18	G-036211	43334	YELLOW CLAY	1175.8021	1157.8021	1068.80
2654713	537816.5	8	G-090726H	106080	GRAY SILTY CLAY	1117.0344	1109.0344	1058.13
2628148	485221.2	15	G-129323A	161443	light brown, moist,	1136.4569	1121.4569	1031.91
2632468	517503.3	40	G-121797	150183	gray clay	1213.8594	1173.8594	1027.41
2655933	464937.6	10	G-105912	125996	coarse brown sand &	1058.7268	1048.7268	993.03
2606954	529248.9	13.5	G-076186	84680	SILTY CLAY LIGHT BRO	1203.1104	1189.6104	1083.75
2656270	537851	6	G-090726G	106079	DARK GRAY SILTY CLAY	1113.4338	1107.4338	1064.64
2608645	520266.5	13	G-096933	107409	Topsoil & Clay	1190.2305	1177.2305	1072.22
2605285	523629.8	14	G-106605	125459	clay	1194.1574	1180.1574	1072.03
2617887	527362.1	71	G-110974	133814	MED GRAY/BROWN CLAY	1311.337	1240.337	1064.32
2666566	500002.1	30	G-135838	170897	dry loess clay	1227.4231	1197.4231	1029.23
2628292	485429.7	14	G-129323D	161448	light brown, moist,	1140.2924	1126.2924	1032.60
2643620	499225.1	11	G-089868	104897	SILTY SAND	1084.3095	1073.3095	1013.12
2663380	494451.5	14	G-035461	42554	YELLOW CLAY	1119.7162	1105.7162	1001.82
2643539	498831.9	10	G-109248	130482	gray clay	1081.4297	1071.4297	1012.47
2616413	546470	55	G-087126	98900	RED AND WHITE CLAY	1257.6784	1202.6784	1127.11
2663089	511130.9	35	G-090203	105314	LIGHT GRAY CLAY	1212.0664	1177.0664	1031.61
2640074	491937.3	16.5	G-116922C	142209	dk brown to reddish	1080.3909	1063.8909	1008.07
2666145	474178.3	44.3	G-087787	99697	SANDY BROWN LOESS	1179.9926	1135.6926	1075.86
2664290	496167	60	G-128779	160569	light gray clay	1149.2547	1089.2547	994.15
2666132	496043.8	81	G-115212	139609	light gray clay	1200.8578	1119.8578	1001.21
2665039	505415	50	G-128002	159564	yellow clay	1221.3608	1171.3608	1062.09
2669594	467330.7	48	G-139351	175577	light brown clay	1221.5805	1173.5805	1089.09
2607417	528960.1	15	G-076201	84695	LEAN CLAY MOTTLES MO	1197.9174	1182.9174	1084.98
2631870	540521.9	28	G-101180	119252	gray silty clay	1193.0561	1165.0561	1075.11
2640873	460401.3	14.5	G-108620B	130028	lean clay/alluvium	1095.1253	1080.6253	1032.45
2657610	504779.3	4	G-004183	8018	SANDY CLAY TOPSOIL	1090.4004	1086.4004	1033.20
2621261	554859.2	45	G-095489	111986	Clay	1293.3161	1248.3161	1019.73
2666598	508318.9	55	G-139010	174974	light brown clay	1296.3848	1241.3848	1061.07
2665131	526902.4	8	G-082992	92834	SILT	1230.0593	1222.0593	1083.34
2606854	530057.4	16.5	G-076184	84678	LEAN CLAY GRAY MOIST	1200.437	1183.937	1082.64
2664059	505070	63	G-128715	160516	light gray clay	1234.085	1171.085	1066.06
2608559	543861.6	10	G-057632	65311	YELLOW CLAY	1312.2628	1302.2628	1093.70
2652636	463333.9	5	G-089876D	104913	SANDY SILTY CLAY MOI	1060.1365	1055.1365	1023.36
2622410	551070.2	40	G-100729	118024	Clay	1301.6496	1261.6496	1048.40
2635148	536573.3	42	G-085892	97281	BROWN CLAY	1212.7253	1170.7253	1107.48
2634732	495218.3	20	G-100738	118611	Dry, Med Brown, Low	1080.9506	1060.9506	1035.88
2616354	518252	15	G-072842	81030	TOP SOIL CLAY	1177.4449	1162.4449	1062.67
2600750	516588.4	13	G-037709	166019	brown clay	1187.4541	1174.4541	1070.61
2663985	520049.1	68	G-089816	104819	LIGHT BROWN CLAY	1243.4048	1175.4048	1107.69
2632853	539392	50	G-136373	169689	Brown clay	1241.0812	1191.0812	1064.95
2666723	491277.1	55	G-096225	103896	Light Brown Clay	1262.4333	1207.4333	975.22
2668175	466460.3	60	G-132495	166023	light brown clay	1231.4214	1171.4214	1117.47
2660473	554213.1	5	G-137569	172708	clay	1120.462	1115.462	1036.88
2668373	481695	35	G-095212	111271	Light Brown Clay	1255.8422	1220.8422	994.39
2667855	511905.1	60	G-057881	65568	BROWN CLAY	1282.1069	1222.1069	1058.81
2607006	529964.5	15	G-076181	84675	LEAN CLAY GREENISH G	1200.4384	1185.4384	1082.95
2632061	542708.5	60	G-105056	125050	tan clay	1223.3806	1163.3806	1078.53
2638605	529450.4	20	G-100078	117788	clay	1120.7394	1100.7394	1081.12

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2668464	484599.5	45	G-134801	169239	light brown clay	1256.1151	1211.1151	977.81
2626288	555013.2	15	G-111826	134662	BROWN CLAY	1191.6901	1176.6901	1052.00
2666770	524507.1	50	G-108002	128211	YELLOW CLAY	1239.2689	1189.2689	1107.23
2642383	460230.7	7	G-138488A	174135	clay, silty, light b	1070.4187	1063.4187	1046.59
2607013	529825.9	12	G-076185	84679	SILTY CLAY LIGHT BRO	1200.5855	1188.5855	1083.14
2647359	514482.8	6	G-127650	159216	Clay	1099.401	1093.401	1015.47
2593465	552796.6	20	G-048065	55522	YELLOW CLAY	1244.5838	1224.5838	1084.04
2642245	460244.2	8	G-135936A	170505	clay, silty, red/bro	1071.1802	1063.1802	1045.23
2664696	517573.3	76	G-103092	121024	tan clay	1256.7512	1180.7512	1128.74
2664561	507622.4	50	G-139291	175605	brown clay	1250.4403	1200.4403	1055.39
2637541	515081.6	15	G-124901	154513	brown clay	1136.9953	1121.9953	1025.27
2661814	505681.3	30	G-119147	145683	light brown clay	1208.4474	1178.4474	1055.89
2622695	451247.4	15	G-102395	120812	clay	1144.5339	1129.5339	1093.74
2635179	457916.4	15	G-053628	61191	CLAY	1070.2598	1055.2598	1034.61
2640617	451715.8	4	G-081932	91066	YELLOW CLAY	1157.04	1153.04	1078.59
2640702	452340.6	8	G-082274	91608	YELLOW CLAY	1147.9768	1139.9768	1077.74
2640920	453093.1	20	G-081736	90747	CLAY	1107.6053	1087.6053	1078.42
2641570	452663.2	30	G-082077	91295	BROWN CLAY	1159.8874	1129.8874	1080.11
2641635	452454.9	40	G-083231	93162	BROWN CLAY	1170.5441	1130.5441	1080.51
2642148	454050.6	26	G-109131	130509	sandy clay	1151.7387	1125.7387	1082.46
2642390	456331.6	15	G-090219	105330	LOESS	1167.4206	1152.4206	1077.70
2642655	453904.2	6	G-096401	112564	Clay	1170.6766	1164.6766	1083.50
2642751	453322.4	14	G-101231	119022	Light Brown Clay	1109.5836	1095.5836	1083.38
2642968	453405.5	24	G-105159	123324	light brown clay	1109.6913	1085.8877	1083.89
2645849	454283.4	25	G-110571	131518	light brown clay	1218.8627	1193.8627	1092.57
2646034	455133	28	G-105158	123317	light brown clay	1219.6103	1191.6103	1097.11
2646376	453797.8	10	G-093612	108972	SILTY SAND	1233.9631	1223.9631	1090.03
2646411	457425.2	28	G-103856	123254	sandy brown clay	1194.7363	1166.7363	1114.67
2647702	459307	30	G-131301	158727	Sandy, silty brown c	1170.5797	1140.5797	1114.85
2647715	457610.1	16	G-083583	93584	CLAY	1211.5738	1195.5738	1107.46
2648925	458334.9	15	G-117043	126654	sandy light brown cl	1154.2184	1139.2184	1088.58
2650588	458357.7	3	G-084822	95854	DARK BROWN CLAY	1149.0259	1146.0259	1028.85
2656352	457850.4	56	G-116930	142059	silt & clay - brn	1123.3714	1067.3714	1060.60
2659100	459674.6	1	G-132687A	166290	clayey silt w/fine s	1050.347	1049.347	972.50
2659486	459162.8	1.5	G-132687J	166299	clayey silt w/fine s	1050.347	1048.847	968.29
2659605	458812.4	0.5	G-109464E	131235	sandy clay	1050.347	1049.847	969.51
2660001	458489.3	5	G-132687H	166297	sandy silty w/slight	1050.347	1045.347	967.79
2660249	459657.4	4.5	G-132687I	166298	clayey silt w/sand;d	1050.347	1045.847	963.76
2661058	458657.4	1.5	G-132687F	166295	ckayey w/silt sand;	1050.347	1048.847	973.74
2618457.25	**511747.16**	8.00	**MW-01A***	**MW-01A***	Loess	1174.42	1166.4	1065.42
2606815.33	**506258.59**	7.00	**MW-02A***	**MW-02A***	Loess	1172.31	1165.3	1072.81
2607535.45	**506237.19**	8.00	**MW-03A***	**MW-03A***	Loess	1177.00	1169.0	1031.00
2612041.47	**506258.63**	8.00	**MW-04A***	**MW-04A***	Loess	1166.16	1158.2	1062.66
2613055.16	**507100.26**	25.00	**MW-05A***	**MW-05A***	Loess	1165.53	1140.5	1064.73
2617379.21	**506527.99**	16.00	**MW-06A***	**MW-06A***	Loess	1162.85	1146.9	1062.85
2618273.93	**507284.03**	18.00	**MW-07A***	**MW-07A***	Loess	1162.31	1144.3	1062.81
2622869.08	**506815.04**	16.00	**MW-08A***	**MW-08A***	Loess	1163.41	1147.4	1040.41
2623593.10	507436.00	16.50	MW-09D	MW-09D	Loess	1169.31	1152.8	1047.71
2607894.07	**496864.63**	10.00	**MW-10A***	**MW-10A***	Loess	1147.82	1137.8	1047.82
2626491.78	**509496.48**	16.00	**MW-11***	**MW-11***	Loess	1150.62	1134.6	1102.62
2606847.50	**509034.48**	11.00	**MW-12***	**MW-12***	Loess	1176.18	1165.2	1140.68
2612220.54	**509172.52**	16.60	**MW-13***	**MW-13***	Loess	1172.60	1156.0	**1068.84**
2617505.68	**509398.95**	8.00	**MW-14***	**MW-14***	Loess	1176.35	1168.4	**1061.28**
2622735.15	**509493.02**	12.50	**MW-15***	**MW-15***	Loess	1167.55	1155.1	**1064.92**
2604907.94	**514029.15**	13.70	**MW-16B***	**MW-16B***	Loess	1186.56	1172.9	1079.76
2629141.88	**506862.47**	8.00	**MW-18A***	**MW-18A***	Loess	1146.90	1138.9	1046.10
2616633.46	**493201.36**	10.00	**MW-20B***	**MW-20B***	Loess	1149.59	1139.6	1037.99
2607131.41	503525.83	19.90	MW-21D	MW-21D	Loess	1163.67	1143.8	1036.37
2606598.39	510402.07	14.80	MW-22A	MW-22A	Loess	1174.93	1160.1	1075.43
2606402.57	509376.37	13.90	MW-23A	MW-23A	Loess	1171.88	1158.0	1072.58
2608476.90	501919.83	15.80	MW-24A	MW-24A	Loess	1161.37	1145.6	1036.37
2608308.41	504875.16	14.00	MW-25A	MW-25A	Loess	1173.23	1159.2	**1018.77**
2608308.83	504864.77	13.50	MW-25D	MW-25D	Loess	1173.54	1160.0	1016.74
2609860.44	508825.09	14.50	MW-26A	MW-26A	Loess	1172.44	1157.9	1068.64

Table 2-1
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2611434.64	508103.04	8.90	MW-27A	MW-27A	Loess	1174.14	1165.2	1067.34
2612969.60	502242.92	11.00	MW-28D	MW-28D	Loess	1169.84	1158.8	1031.84
2614469.84	498383.11	14.30	MW-29A	MW-29A	Loess	1158.50	1144.2	1021.40
2616288.05	507064.55	19.80	MW-30A	MW-30A	Loess	1166.61	1146.8	1065.11
2617943.95	503233.70	8.00	MW-31A	MW-31A	Loess	1165.35	1157.3	1059.35
2619697.54	499055.63	17.00	MW-32D	MW-32D	Loess	1152.07	1135.1	1052.57
2622421.53	502856.97	7.50	MW-33D	MW-33D	Loess	1158.29	1150.8	1041.79
2624442.36	498796.40	19.90	MW-34D	MW-34D	Loess	1154.83	1134.9	1041.93
2629595.80	496317.10	17.50	MW-35D	MW-35D	Loess	1137.78	1120.3	1044.78
2634814.84	496694.95	15.00	MW-36A	MW-36A	Loess	1076.84	1061.8	**1037.80**
2634824.46	496697.59	15.50	MW-36D	MW-36D	Loess	1076.93	1061.4	1037.93
2633413.67	491666.00	10.50	MW-37D	MW-37D	Loess	1082.98	1072.5	1041.48
2638131.88	496248.57	13.10	MW-38A	MW-38A	Loess	1079.98	1066.9	1030.78
2640062.25	499304.69	10.70	MW-39A	MW-39A	Loess	1081.00	1070.3	1032.50
2623018.62	511963.35	15.70	MW-40A	MW-40A	Loess	1170.09	1154.4	1042.49
2624371.47	512001.33	19.00	MW-41A	MW-41A	Loess	1166.32	1147.3	1084.02
2624353.22	512000.98	19.00	MW-41D	MW-41D	Loess	1166.41	1147.4	1084.41
2629385.20	501582.56	16.00	MW-42A	MW-42A	Loess	1144.54	1128.5	**1046.31**
2629384.99	501572.17	16.00	MW-42D	MW-42D	Loess	1144.41	1128.4	1046.61
2629243.07	504317.91	17.00	MW-43A	MW-43A	Loess	1141.02	1124.0	**1040.43**
2629242.21	504308.09	16.30	MW-43D	MW-43D	Loess	1140.95	1124.7	1039.45
2632952.84	500403.76	17.00	MW-44D	MW-44D	Loess	1092.31	1075.3	1048.31
2635032.46	499241.76	11.75	MW-45D	MW-45D	Loess	1079.66	1067.9	1040.66
2637465.40	499375.99	11.50	MW-46D	MW-46D	Loess	1080.71	1069.2	1033.21
2603834.71	524480.73	20.00	MW-47A	MW-47A	Loess	1199.76	1179.8	1073.76
2607436.75	519363.04	18.00	MW-48A	MW-48A	Loess	1191.36	1173.4	1069.36
2607427.86	519358.29	18.00	MW-48D	MW-48D	Loess	1191.64	1173.6	1072.24
2627012.55	508784.57	18.80	MW-52A	MW-52A	Loess	1153.51	1134.7	1093.51
2627897.77	508169.88	10.90	MW-53A	MW-53A	Loess	1134.42	1123.5	1034.52
2627893.82	508858.25	23.00	MW-54A	MW-54A	Loess	1119.72	1096.7	1038.22
2628135.40	508377.66	5.00	MW-55A	MW-55A	Loess	1124.52	1119.5	1039.52
2628206.01	508215.32	4.00	MW-56A	MW-56A	Loess	1124.17	1120.2	1043.17
2620357.49	515008.03	19.80	MW-58A	MW-58A	Loess	1173.48	1153.7	1038.48
2621717.33	515878.49	9.50	MW-59D	MW-59D	Loess	1160.85	1151.3	1035.85
2624702.83	489585.15	7.70	MW-60A	MW-60A	Loess	1145.83	1138.1	1043.33
2608667.93	492901.85	8.90	MW-61D	MW-61D	Loess	1108.96	1100.1	1021.46
2635407.14	493876.96	17.10	MW-62D	MW-62D	Loess	1078.89	1061.8	1041.29
2613167.91	519473.60	13.00	MW-63B	MW-63B	Loess	1175.66	1162.7	**1063.98**
2628038.55	510106.02	8.00	MW-64B	MW-64B	Loess	1142.35	1134.3	**1044.08**
2613278.51	506026.73	11.50	MW 66A	MW 66A	Loess	1170.4	1158.9	**1064.98**
2622921.73	512064.19	17.50	MW 72B	MW 72B	Loess	1169.8	1152.3	**1044.34**
2623060.93	511909.15	17.00	MW 73A	MW 73A	Loess	1168.5	1151.5	**1047.05**
2623093.85	511934.84	17.50	MW 74A	MW 74A	Loess	1168.5	1151.0	**1047.24**
2611637.99	492369.38	11	MW-81A	MW-81A	Loess	1106.30	1095.3	1012.10
2619293.00	493310.90	16.4	MW-82D	MW-82D	Loess	1147.1	1130.7	1035.10
2621922.97	495288.85	12.4	MW-83D	MW-83D	Loess	1150.3	1137.9	1039.30
2624275.75	495695.58	16.4	MW-84D	MW-84D	Loess	1143.3	1126.9	1045.80
2628338.54	494428.03	12.5	MW-85D	MW-85D	Loess	1130.4	1117.9	1045.90
2610430.84	494253.88	13	MW-89A	MW-89A	Loess	1158.81	1145.8	**1019.55**
2611235.54	494302.04	13	MW-90A	MW-90A	Loess	1148.94	1135.9	**1023.19**
2612085.70	494327.97	11.7	MW-91D	MW-91D	Loess	1149.78	1138.1	1064.78
2610047.26	492722.58	13	MW-92A	MW-92A	Loess	1106.58	1093.6	1024.08
2612162.89	493551.29	13	MW-93A	MW-93A	Loess	1122.07	1109.1	1027.07
2607927.78	499751.19	20	OW-01	OW-01	Loess	1159.48	1139.5	**1008.03**
2607887.77	499740.64	20	OW-02	OW-02	Loess	1159.40	1139.4	**1008.44**
2607941.06	499793.70	20	OW-03	OW-03	Loess	1159.04	1139.0	**1008.45**
2607941.17	499768.09	20	OW-04	OW-04	Loess	1159.40	1139.4	**1008.08**
2634938.91	495185.76	16.5	OW-05	OW-05	Loess	1079.63	1063.1	1040.63
2634888.37	495207.57	17	OW-06	OW-06	Loess	1076.74	1059.7	1037.24
2634888.21	495205.12	16.5	OW-07	OW-07	Loess	1076.74	1060.2	1037.24
2634790.16	495195.78	17	OW-08	OW-08	Loess	1075.78	1058.8	1036.08
2634941.88	495136.17	16.5	OW-09	OW-09	Loess	1078.56	1062.1	1038.56
2635089.59	495208.15	16	OW-10	OW-10	Loess	1076.87	1060.9	1037.87
2635255.85	495171.05	21.00	OW-11	OW-11	Loess	1075.78	1054.8	1031.78

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2636334.21	495282.45	15.90	OW-12	OW-12	Loess	1077.27	1061.4	1036.27
2634931.02	495125.05	20.00	OW-13	OW-13	Loess	1078.56	1058.6	1039.56
2634938.64	494991.12	19.50	OW-14	OW-14	Loess	1077.90	1058.4	1038.90
2634949.63	494791.56	22.00	OW-15	OW-15	Loess	1078.06	1056.1	1036.06
2633483.41	495162.80	22.90	OW-16	OW-16	Loess	1075.01	1052.1	1036.01
2608709.98	499902.62	24.80	OW-19	OW-19	Loess	1169.49	1144.7	1020.49
2608019.74	499355.14	24.00	OW-22	OW-22	Loess	1158.59	1134.6	1006.09
2607158.35	499656.44	40.00	OW-23	OW-23	Loess	**1158.88**	1118.9	1022.38
2629552.06	496984.50	15.00	OW-24	OW-24	Loess	1149.56	1134.6	1048.56
2629214.17	496664.05	10.00	OW-26	OW-26	Loess	1145.12	1135.1	1044.12
2629582.05	496942.21	16.00	OW-27	OW-27	Loess	1149.80	1133.8	1051.80
2629581.52	496898.00	9.00	OW-28	OW-28	Loess	1150.76	1141.8	1049.76
2629965.06	497303.88	16.00	OW-30	OW-30	Loess	1128.69	1112.7	1041.69
2624242.96	497898.99	37.00	OW-31	OW-31	Loess	1152.35	1115.4	1048.35
2624139.95	497845.07	15.00	OW-32	OW-32	Loess	1151.31	1136.3	1047.31
2623750.57	497669.79	16.00	OW-33	OW-33	Loess	1152.38	1136.4	1033.88
2624360.77	497738.45	17.00	OW-35	OW-35	Loess	1150.66	1133.7	1046.66
2624413.00	497337.59	19.00	OW-36	OW-36	Loess	1153.96	1135.0	1040.96
2624838.27	498178.35	13.00	OW-37	OW-37	Loess	1154.41	1141.4	1045.66
2621733.08	496294.86	18.00	OW-38	OW-38	Loess	1147.66	1129.7	1049.66
2621620.02	496212.33	19.00	OW-39	OW-39	Loess	1147.82	1128.8	1050.82
2621297.36	495975.58	20.00	OW-40	OW-40	Loess	1154.21	1134.2	1050.21
2621816.64	496281.90	18.00	OW-41	OW-41	Loess	1146.75	1128.8	1051.75
2621899.70	496169.43	17.00	OW-42	OW-42	Loess	1147.71	1130.7	1052.71
2622135.38	495845.76	15.00	OW-43	OW-43	Loess	1153.24	1138.2	1050.24
2622302.63	496682.05	18.00	OW-44	OW-44	Loess	1144.63	1126.6	1050.63
2619203.17	494842.21	19.00	OW-45	OW-45	Loess	1149.11	1130.1	1035.11
2619059.00	494783.36	18.00	OW-46	OW-46	Loess	1148.16	1130.2	1042.66
2618684.83	494630.88	16.00	OW-47	OW-47	Loess	1149.85	1133.9	1049.85
2619283.37	494800.47	14.50	OW-48	OW-48	Loess	1150.11	1135.6	1032.11
2619315.78	494671.87	19.00	OW-49	OW-49	Loess	1150.81	1131.8	1036.81
2619465.62	494300.16	19.50	OW-50	OW-50	Loess	1147.70	1128.2	1043.20
2619790.64	495096.02	10.00	OW-51	OW-51	Loess	1146.50	1136.5	**1041.28**
2634926.92	495190.58	20.00	EW-1	EW-1	Loess	1084.37	1064.4	1042.37
2632445.94	496479.68	20.00	EW-2	EW-2	Loess	1101.38	1081.4	1043.38
2629583.28	497009.50	10.00	EW-3	EW-3	Loess	1148.38	1138.4	1045.58
2627116.10	497384.80	19.00	EW-4	EW-4	Loess	1146.39	1127.4	1044.39
2624295.95	497923.55	35.00	EW-5	EW-5	Loess	1151.39	1116.4	1047.89
2622892.98	497269.75	20.00	EW-6	EW-6	Loess	1144.39	1124.4	1055.89
2621781.70	496331.02	15.00	EW-7	EW-7	Loess	1146.39	1131.4	1054.89
2607945.83	499756.90	20.00	EW-8	EW-8	Loess	1162.41	1142.4	1010.41
2620401.35	495320.23	20.00	EW-9	EW-9	Loess	1152.39	1132.4	1049.39
2619241.53	494857.11	15.00	EW-10	EW-10	Loess	1148.39	1133.4	1048.89
2609168.75	499999.28	20.00	EW-11	EW-11	Loess	1161.41	1141.4	1022.41
2613252.36	506039.55	11.5	GCW-2	GCW-2	Loess	1170.4	1158.9	**1064.87**
2622991.70	511987.67	15	GCW-1	GCW-1	Loess	1169.5	1154.5	**1045.22**
2604191.65	522957.92	5	ADS-003	ADS-003	Loess	1201.93	1196.9	**1073.22**
2604579.81	522582.63	17.5	ADS-005	ADS-005	Loess	1199.11	1181.6	**1071.78**
2604081.81	522345.32	15.5	ADS-022	ADS-022	Loess	1203.37	1187.9	**1073.80**
2621936.33	515640.34	12	ATL-006	ATL-006	Loess	1167.00	1155.0	**1036.27**
2621739.52	515431.35	16	ATL-048	ATL-048	Loess	1172.01	1156.0	**1036.54**
2619307.93	516416.41	16	ATL-058	ATL-058	Loess	1171.69	1155.7	**1046.55**
2619543.24	516171.11	19.8	ATL-059	ATL-059	Loess	1172.53	1152.7	**1044.93**
2619778.55	515925.82	18.5	ATL-060	ATL-060	Loess	1173.17	1154.7	**1043.26**
2620484.51	515189.89	18	ATL-063	ATL-063	Loess	1174.71	1156.7	**1038.77**
2620955.10	514699.21	17	ATL-065	ATL-065	Loess	1176.83	1159.8	**1038.71**
2621415.65	513727.92	16	ATL-083	ATL-083	Loess	1173.50	1157.5	**1041.11**
2618346.66	516436.42	16	ATL-086	ATL-086	Loess	1174.06	1158.1	**1051.56**
2618336.70	515955.84	16	ATL-099	ATL-099	Loess	1179.81	1163.8	**1051.10**
2619748.59	514484.00	16	ATL-105	ATL-105	Loess	1176.19	1160.2	**1043.91**
2618562.01	515229.98	8	ATL-113	ATL-113	Loess	1181.92	1173.9	**1049.69**
2604789.88	522888.56	17.5	G1-14	G1-14	Loess	1197.06	1179.6	**1071.52**
2605212.50	522700.67	17	G1-15	G1-15	Loess	1196.13	1179.1	**1070.02**
2604191.65	522957.92	4	G1-24	G1-24	Loess	1201.93	1197.9	**1073.22**

Table 2-1
Top of Bedrock and Base of Loess Elevations
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Layer 1 Thick-ness (ft)	DNR Reg. Code	DNR Well_ID	Description	Ground Surface Elev. (NAVD 88)	Layer 1 Bottom Elev (NAVD 88)	Bedrock Elevation (NAVD 88)
2605356.11	521831.92	15	G1-27	G1-27	Loess	1196.09	1181.1	**1067.64**
2603907.67	522663.73	23.5	G1-35	G1-35	Loess	1202.78	1179.3	**1074.13**
2604372.91	522022.90	16.5	G1-37	G1-37	Loess	1204.63	1188.1	**1071.55**
2604073.83	522023.30	14.5	G1-47	G1-47	Loess	1200.4	1185.9	**1073.75**
2617342.65	516195.96	15	G2-02	G2-02	Loess	1188.31	1173.3	**1055.68**
2618199.46	517875.80	11	G2-03	G2-03	Loess	1163.49	1152.5	**1055.39**
2617482.72	512662.81	19	G2-04	G2-04	Loess	1174.96	1156.0	**1058.25**
2624880.84	514649.89	16	G2-08	G2-08	Loess	1161.32	1145.3	**1043.77**
2624516.94	512019.68	25	G2-12	G2-12	Loess	1164.05	1139.0	**1081.30**
2619251.33	509115.56	18	G2-14	G2-14	Loess	1166.84	1148.8	**1057.57**
2628776.47	509528.26	30	G2-18	G2-18	Loess	1151.51	1121.5	**1040.68**
2624861.48	504537.13	15	G2-20	G2-20	Loess	1147.84	1132.8	**1047.52**
2626613.71	505871.77	17	G2-21	G2-21	Loess	1155.34	1138.3	**1074.65**
2628300.09	508223.79	14	G2-22	G2-22	Loess	1115.0	1101.0	**1041.08**
2626906.41	501541.52	20	G2-25	G2-25	Loess	1143.81	1123.8	**1047.13**
2629241.84	504303.36	15	G2-26	G2-26	Loess	1140.78	1125.8	**1040.48**
2631610.92	505688.40	17	G2-27	G2-27	Loess	1143.95	1127.0	1044.95
2629407.58	500378.92	15	G2-30	G2-30	Loess	1139.4	1124.4	**1046.76**
2632100.02	501708.76	7	G2-31	G2-31	Loess	1122.72	1115.7	**1046.58**
2633343.39	504358.43	12	G2-32	G2-32	Loess	1105.3	1093.3	**1039.36**
2632709.15	496465.34	25	G2-34	G2-34	Loess	1088.6	1063.6	**1041.06**
2632814.94	498254.30	20	G2-35	G2-35	Loess	1090.3	1070.3	**1043.60**
2634931.90	499248.41	10	G2-36	G2-36	Loess	1075.1	1065.1	**1040.64**
2634854.10	501835.47	15.5	G2-37	G2-37	Loess	1084.7	1069.2	**1042.12**
2634612.13	504462.41	15	G2-38	G2-38	Loess	1091.2	1076.2	1042.00
2634873.46	497422.92	25	G2-39	G2-39	Loess	1070.8	1045.8	**1039.06**
2605859.44	512043.57	16	G3-01	G3-01	Loess	1178.12	1162.1	**1075.66**
2607701.02	512271.24	18.5	G3-02	G3-02	Loess	1176.68	1158.2	**1068.89**
2605425.21	508782.15	13	G3-04	G3-04	Loess	1173.08	1160.1	**1059.41**
2607191.85	508980.59	18	G3-05	G3-05	Loess	1174.98	1157.0	**1066.63**
2610433.32	508885.07	16	G3-07	G3-07	Loess	1175.70	1159.7	**1068.38**
2605044.23	505615.49	21	G3-08	G3-08	Loess	1167.62	1146.6	**1040.59**
2611896.15	506279.04	14	G3-12	G3-12	Loess	1166.25	1152.2	**1058.55**
2605706.80	501382.46	20	G3-13	G3-13	Loess	1157.58	1137.6	**1042.48**
2610482.55	501762.47	17	G3-15	G3-15	Loess	1165.86	1148.9	**1033.03**
2612511.58	501810.77	22	G3-16	G3-16	Loess	1161.50	1139.5	**1031.69**
2608510.23	498292.41	19.5	G3-19	G3-19	Loess	1159.93	1140.4	**1025.61**
2629721.25	493738.95	26	H-01	H-01	Loess	1138.29	1112.3	**1044.59**
2638383.56	499425.65	13	H-02	H-02	Loess	1081.15	1068.1	**1030.15**
2637359.79	501924.85	13	H-03	H-03	Loess	1082.50	1069.5	**1037.05**
2631087.41	488498.28	7	H-04	H-04	Loess	1143.28	1136.3	**1031.63**
2638133.05	496237.51	19	H-05	H-05	Loess	1079.55	1060.6	**1030.86**
2640063.71	499294.15	13	H-06	H-06	Loess	1081.61	1068.6	**1031.71**
2640042.56	500739.32	15	H-07	H-07	Loess	1082.91	1067.9	**1031.74**
2603683.70	522077.52	14	H2-01	H2-01	Loess	1200.4	1186.4	**1074.91**
2604184.32	522045.36	16	H2-02	H2-02	Loess	1201.0	1185.0	**1072.96**
2605033.15	521570.05	15	H2-03	H2-03	Loess	1201.4	1186.4	**1067.84**
2604469.42	522502.36	12	H2-04	H2-04	Loess	1201.1	1189.1	**1072.11**
2605362.62	510372.94	13	LL1-002	LL1-002	Loess	1179.90	1166.9	**1068.52**
2606129.33	509640.37	16	LL1-039	LL1-039	Loess	1178.07	1162.1	**1071.15**
2606341.82	509594.76	2	LL1-047	LL1-047	Loess	1173.00	1171.0	**1072.24**
2606436.15	509735.37	12	LL1-048	LL1-048	Loess	1174.21	1162.2	**1072.93**
2606432.60	509497.27	11	LL1-055	LL1-055	Loess	1170.59	1159.6	**1071.89**
2606079.17	509217.02	15	LL1-068	LL1-068	Loess	1178.8	1163.8	**1068.00**
2606174.50	509102.13	14	LL1-069	LL1-069	Loess	1180.3	1166.3	**1067.33**
2606242.94	508772.14	15	LL1-075	LL1-075	Loess	1175.8	1160.8	**1063.78**
2606619.37	508779.48	14	LL1-080	LL1-080	Loess	1171.5	1157.5	**1064.77**
2606323.60	507699.06	13	LL1-094	LL1-094	Loess	1171.2	1158.2	**1050.91**

Table 2-2
Surface Water Elevation Measurements
March 2005 and March 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

March 2005

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar05)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Leshara	2,627,547.67	562,057.16	1148.76	0		
Venice	2,647,109.18	518,421.66	1102.20	54,454	0.00085	4.5
Platte_Ashland	2,653,340.91	469,165.64	1056.29	111,424	0.00081	4.3

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar05)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Elkhorn_Waterloo	2,660,970.79	553,749.41	1108.92	0		
Elk Horn River-1	2,658,801.15	521,384.22	1092.52	38,634	0.00042	2.2
Est. Platte River Elev. at Mouth of Elkhorn	2,655,179.99	491,048.72	1076.57	72,946	0.00046	2.5

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar05)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Johnson_Cr_Memphis	2,634,921.48	499,072.98	1073.50	14,918		
Confluence with Clear Creek	2,635,077.50	494,526.64	1071.94	19,468	0.00034	1.8

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar05)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Clear Creek-1	2,637,598.46	499,320.48	1073.22	22,247		
Clear Creek-2	2,637,638.44	478,162.43	1062.65	44,954	0.00047	2.5

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar05)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Wahoo-5	2,562,055.25	554,732.88	1223.88			
Ithaca	2,593,410.59	497,778.58	1114.39	72,670	0.0015	8.0
Wahoo Creek-2	2,603,461.18	492,183.23	1098.11	96,730	0.00068	3.6
Wahoo-1	2,621,893.97	477,485.72	1075.38	129,178	0.00070	5.0
Wahoo_Ashland	2,641,613.33	465,530.43	1053.37	161,036	0.00069	5.0

Table 2-2
Surface Water Elevation Measurements
March 2005 and March 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

March 2006

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar06)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
LeShara	2,627,547.67	562,057.16	1149.05	0		
Venice	2,647,109.18	518,421.66	1101.89	54,454	0.00087	4.6
Platte_Ashland	2,653,340.91	469,165.64	1056.32	111,424	0.00080	4.2

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar06)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
JC-1	2,629,262.42	507,533.78	1106.82	2,894		
JC-2	2,634,265.02	504,484.02	1084.30	10,317	0.0030	16.0
Johnson_Cr_Memphis	2,634,921.48	499,072.98	1073.58	15,778	0.0020	10.4
Confluence with Clear Creek	2,635,077.50	494,526.64	1069.81	19,468	0.0010	5.0

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar06)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
CC-2	2,641,604.61	520,633.91	1100.18	0		
CC-1	2,639,130.56	504,659.38	1076.35	16,952	0.0014	7.4
MUD Clear Creek-1	2,637,598.46	499,320.48	1073.28	22,625	0.00054	2.9
CC-3	2,635,074.54	493,881.22	1069.09	29,108	0.00065	3.4
CC-4	2,637,613.52	478,165.86	1062.79	45,426	0.00039	2.0
Wahoo Cr	2,644,077.96	465,332.78	**1052.02**	62,491	0.00063	3.3

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar06)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
SilverCreek4	2,590,012.72	529,416.30	1173.01	33,761		
SilverCreek3	2,593,056.83	508,591.71	1132.90	61,983	0.0014	7.5
SilverCreek2	2,597,968.98	498,692.56	1115.76	77,647	0.0011	5.8
SilverCreek1	2,609,218.05	492,882.27	1100.68	94,219	0.00091	4.8
Wahoo-1 (confluence)	2,621,893.97	477,485.72	1075.38	120,252	0.0010	5.1

River Gauge	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar06)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Wahoo-5	2,562,055.25	554,732.88	1223.9(1)			
Ithaca	2,593,410.59	497,778.58	1114.79	72,638	0.0015	7.9
Wahoo Creek-2	2,603,461.18	492,183.23	1098.1(1)	96,730	0.00069	3.7
Wahoo-1	2,621,893.97	477,485.72	1075.4(1)	129,178	0.00070	3.7
Wahoo_Ashland	2,641,613.33	465,530.43	1053.34	161,081	0.00069	3.6
Salt Creek Mouth	2,655,158.46	462,598.63	1050.32	186,701	0.00012	0.62

River Guage	Easting (NAD 83)	Northing (NAD 83)	Est. River Stage (Mar06)	Cumulative Distance (ft)	Gradient (ft/ft)	Gradient (ft/mi)
Elkhorn_Waterloo	2,660,970.79	553,749.41	1109.19	0		
Est. Platte River Elev. at Mouth of Elkhorn	2,655,179.99	491,048.72	1076.43	72,946	0.00045	2.4

Notes:

(1) Not measured in March 2006. March 2005 data used in order to estimate gradient.

Table 2-3
Groundwater Elevations, March 2006 and October 2006
Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Sample ID	Depth Desig-nation	Top of Casing Elev. (ft AMSL, NAVD88)	March 29, 2006 Depth to Water from TOC (ft)	March 29, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)	October 30, 2006 Depth to Water from TOC (ft)	October 30, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)
MW-01A	Intermed.	1176.88	45.62	1131.26	45.86	1131.02
MW-01B	Shallow	1176.73	45.41	1131.32	45.72	1131.01
MW-02A	Intermed.	1174.77	44.36	1130.41	45.23	1129.54
MW-02B	Shallow	1175.18	NM	NM	45.68	1129.50
MW-03A	Intermed.	1179.56	49.72	1129.84	50.74	1128.82
MW-03B	Shallow	1179.83	49.93	1129.90	50.94	1128.89
MW-04A	Intermed.	1168.73	40.58	1128.15	41.26	1127.47
MW-04B	Shallow	1168.85	40.70	1128.15	41.39	1127.46
MW-05A	Intermed.	1168.12	39.03	1129.09	39.59	1128.53
MW-05B	Shallow	1168.18	39.18	1129.00	39.73	1128.45
MW-06A	Intermed.	1165.46	43.37	1122.09	44.01	1121.45
MW-06B	Shallow	1165.61	43.54	1122.07	44.17	1121.44
MW-07A	Intermed.	1164.85	42.49	1122.36	43.20	1121.65
MW-07B	Shallow	1164.64	42.27	1122.37	42.97	1121.67
MW-08A	Intermed.	1165.92	NM	NM	51.51	1114.41
MW-08B	Shallow	1165.92	NM	NM	51.50	1114.42
MW-09A	Intermed.	1171.46	NM	NM	56.60	1114.86
MW-09B	Shallow	1171.60	NM	NM	56.38	1115.22
MW-09D	Bedrock	1171.28	NM	NM	56.35	1114.93
MW-10A	Intermed.	1150.35	42.73	1107.62	42.95	1107.40
MW-10B	Shallow	1150.31	42.67	1107.64	42.88	1107.43
MW-11	Intermed.	1153.22	34.05	1119.17	32.58	1120.64
MW-12	Shallow	1178.55	40.07	1138.48	40.01	1138.54
MW-13	Shallow	1175.20	40.46	1134.74	41.19	1134.01
MW-14	Shallow	1178.94	50.37	1128.57	50.47	1128.47
MW-15	Shallow	1170.06	NM	NM	49.03	1121.03
MW-16B	Intermed.	1188.68	39.31	1149.37	40.38	1148.30
MW-16C	Shallow	1189.40	40.06	1149.34	41.14	1148.26
MW-17A	Bedrock	1128.60(1)	10.93	1117.77	11.14	1117.46
MW-17B	Intermed.	1128.50(1)	11.52	1117.38	11.21	1117.29
MW-17C	Shallow	1128.40(1)	11.17	1117.53	11.39	1117.01
MW-18A	Bedrock	1145.43	45.58	1099.85	46.28	1099.15
MW-18B	Intermed.	1145.57	46.11	1099.46	46.79	1098.78
MW-18C	Shallow	1146.05	43.97	1102.08	44.38	1101.67
MW-19A	Bedrock	1158.65	16.78	1141.87	17.64	1141.01
MW-19B	Intermed.	1158.59	16.98	1141.61	17.79	1140.80
MW-19C	Shallow	1159.26	NM	NM	NM	NM
MW-20A	Bedrock	1160.42	64.06	1096.36	64.56	1095.86
MW-20B	Intermed.	1160.29	NM	NM	64.42	1095.87
MW-20C	Shallow	1160.29	61.87	1098.42	62.36	1097.93
MW-21A	Intermed.	1165.63	40.21	1125.42	41.04	1124.59

Table 2-3
Groundwater Elevations, March 2006 and October 2006
Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Sample ID	Depth Desig-nation	Top of Casing Elev. (ft AMSL, NAVD88)	March 29, 2006 Depth to Water from TOC (ft)	March 29, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)	October 30, 2006 Depth to Water from TOC (ft)	October 30, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)
MW-21B	Shallow	1165.59	40.19	1125.40	41.03	1124.56
MW-21D	Bedrock	1165.57	40.20	1125.37	41.02	1124.55
MW-22A	Intermed.	1176.78	36.07	1140.71	36.70	1140.08
MW-22B	Shallow	1176.67	36.02	1140.65	36.72	1139.95
MW-23A	Intermed.	1173.56	35.73	1137.83	36.40	1137.16
MW-23B	Shallow	1173.93	36.11	1137.82	36.76	1137.17
MW-24A	Intermed.	1163.41	43.95	1119.46	44.67	1118.74
MW-24B	Bedrock	1163.46	43.72	1119.74	44.47	1118.99
MW-25A	Intermed.	1175.25	48.44	1126.81	49.48	1125.77
MW-25B	Shallow	1174.71	NM	NM	48.91	1125.80
MW-25D	Bedrock	1175.46	NM	NM	49.77	1125.69
MW-26A	Intermed.	1174.15	NM	NM	38.61	1135.54
MW-26B	Shallow	1174.16	37.69	1136.47	38.65	1135.51
MW-27A	Intermed.	1176.05	42.62	1133.43	43.39	1132.66
MW-27B	Shallow	1176.06	42.61	1133.45	43.39	1132.67
MW-28A	Intermed.	1172.22	54.41	1117.81	55.17	1117.05
MW-28B	Shallow	1172.52	54.93	1117.59	55.70	1116.82
MW-28D	Bedrock	1171.99	54.21	1117.78	54.96	1117.03
MW-29A	Intermed.	1160.06	53.21	1106.85	53.85	1106.21
MW-29B	Shallow	1161.03	54.12	1106.91	54.74	1106.29
MW-30A	Intermed.	1168.55	NM	NM	44.63	1123.92
MW-30B	Shallow	1168.38	NM	NM	44.48	1123.90
MW-31A	Intermed.	1167.38	52.98	1114.40	53.62	1113.76
MW-31B	Shallow	1166.95	53.13	1113.82	53.78	1113.17
MW-32A	Intermed.	1154.17	53.40	1100.77	53.94	1100.23
MW-32B	Shallow	1154.10	53.34	1100.76	53.88	1100.22
MW-32D	Bedrock	1154.02	53.26	1100.76	53.81	1100.21
MW-33A	Intermed.	1160.32	55.82	1104.50	56.49	1103.83
MW-33B	Shallow	1160.37	55.61	1104.76	56.50	1103.87
MW-33D	Bedrock	1160.24	55.86	1104.38	56.25	1103.99
MW-34A	Intermed.	1156.79	63.75	1093.04	64.14	1092.65
MW-34B	Shallow	1157.00	63.94	1093.06	64.33	1092.67
MW-34D	Bedrock	1156.73	63.80	1092.93	64.16	1092.57
MW-35A	Intermed.	1139.81	56.70	1083.11	57.02	1082.79
MW-35B	Shallow	1139.57	56.55	1083.02	57.18	1082.39
MW-35D	Bedrock	1139.67	56.53	1083.14	57.00	1082.67
MW-36A	Intermed.	1076.62	1.12	1075.50	1.39	1075.23
MW-36B	Shallow	1076.65	1.13	1075.52	1.40	1075.25

Table 2-3
Groundwater Elevations, March 2006 and October 2006
Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Sample ID	Depth Desig-nation	Top of Casing Elev. (ft AMSL, NAVD88)	March 29, 2006 Depth to Water from TOC (ft)	March 29, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)	October 30, 2006 Depth to Water from TOC (ft)	October 30, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)
MW-36D	Bedrock	1076.79	1.27	1075.52	1.51	1075.28
MW-37A	Intermed.	1085.20	8.74	1076.46	9.04	1076.16
MW-37B	Shallow	1085.19	8.70	1076.49	9.00	1076.19
MW-37D	Bedrock	1085.06	8.62	1076.44	8.94	1076.12
MW-38A	Intermed.	1082.32	7.06	1075.26	7.11	1075.21
MW-38D	Bedrock	1081.92	6.62	1075.30	6.68	1075.24
MW-39A	Intermed.	1082.82	6.62	1076.20	4.49	1078.33
MW-39D	Bedrock	1082.95	4.38	1078.57	4.50	1078.45
MW-40A	Intermed.	1172.09	45.50	1126.59	45.82	1126.27
MW-40B	Shallow	1172.34	45.65	1126.69	45.99	1126.35
MW-41A	Intermed.	1168.63	43.24	1125.39	43.19	1125.44
MW-41B	Shallow	1168.68	43.26	1125.42	43.18	1125.50
MW-41D	Bedrock	1168.61	43.20	1125.41	43.15	1125.46
MW-42A	Intermed.	1146.53	55.05	1091.48	55.80	1090.73
MW-42B	Shallow	1146.64	55.18	1091.46	55.89	1090.75
MW-42D	Bedrock	1146.20	54.88	1091.32	55.59	1090.61
MW-43A	Intermed.	1142.90	47.92	1094.98	48.71	1094.19
MW-43B	Shallow	1142.74	47.86	1094.88	48.62	1094.12
MW-43D	Bedrock	1142.95	47.97	1094.98	48.79	1094.16
MW-44A	Intermed.	1093.68	10.47	1083.21	10.80	1082.88
MW-44B	Shallow	1092.46	11.48	1080.98	12.06	1080.40
MW-44D	Bedrock	1094.20	9.25	1084.95	9.58	1084.62
MW-45A	Intermed.	1081.53	3.62	1077.91	3.76	1077.77
MW-45B	Shallow	1081.54	3.57	1077.97	3.71	1077.83
MW-45D	Bedrock	1081.44	3.52	1077.92	3.68	1077.76
MW-46A	Intermed.	1082.70	4.28	1078.42	4.43	1078.27
MW-46B	Shallow	1082.81	4.40	1078.41	4.53	1078.28
MW-46D	Bedrock	1082.65	4.24	1078.41	4.91	1077.74
MW-47A	Intermed.	1201.73	NM	NM	32.89	1168.84
MW-47B	Shallow	1201.67	NM	NM	32.79	1168.88
MW-52A	Intermed.	1155.22	41.53	1113.69	41.08	1114.14
MW-52B	Shallow	1155.65	42.09	1113.56	41.63	1114.02
MW-53A	Intermed.	1136.36	30.48	1105.88	30.90	1105.46
MW-53B	Shallow	1136.91	29.20	1107.71	29.81	1107.10
MW-54A	Intermed.	1121.58	13.94	1107.64	14.19	1107.39
MW-54B	Shallow	1121.59	11.38	1110.21	11.39	1110.20
MW-55A	Intermed.	1126.49	20.57	1105.92	20.90	1105.59
MW-55B	Shallow	1127.27	21.09	1106.18	21.45	1105.82
MW-56A	Intermed.	1125.96	20.60	1105.36	21.03	1104.93
MW-56B	Shallow	1126.24	19.06	1107.18	19.60	1106.64
MW-57B	Shallow	1196.27	44.05	1152.22	45.32	1150.95

Table 2-3
Groundwater Elevations, March 2006 and October 2006
Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Sample ID	Depth Desig-nation	Top of Casing Elev. (ft AMSL, NAVD88)	March 29, 2006 Depth to Water from TOC (ft)	March 29, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)	October 30, 2006 Depth to Water from TOC (ft)	October 30, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)
MW-60A	Intermed.	1146.15	58.68	1087.47	59.40	1086.43
MW-60B	Shallow	1146.15	58.96	1087.19	59.70	1086.45
MW-61A	Intermed.	1108.96	8.34	1100.62	8.34	1100.62
MW-61B	Shallow	1108.96	8.39	1100.57	8.36	1100.60
MW-61D	Bedrock	1108.96	8.16	1100.80	8.17	1100.79
MW-62A	Intermed.	1078.66	5.01	1073.65	5.27	1073.39
MW-62B	Shallow	1078.57	5.27	1073.30	5.18	1073.39
MW-62D	Bedrock	1078.89	4.91	1073.98	5.52	1073.37
MW-63B	Shallow	1177.45	24.62	1152.83	25.72	1151.73
MW-64B	Shallow	1144.20	31.12	1113.08	30.24	1113.96
MW-79A	Intermed.	1109.34	11.18	1098.16	11.28	1098.06
MW-79B	Shallow	1109.39	11.22	1098.17	11.32	1098.07
MW-80A	Intermed.	1107.43	9.46	1097.97	9.55	1097.88
MW-80B	Shallow	1107.65	9.70	1097.95	9.81	1097.84
MW-80D	Bedrock	1107.40	9.41	1097.99	9.52	1097.88
MW-81A	Intermed.	1108.48	10.40	1098.08	10.56	1097.92
MW-81B	Shallow	1108.47	10.46	1098.01	10.63	1097.84
MW-81D	Bedrock	1108.53	10.31	1098.22	10.49	1098.04
MW-82A	Intermed.	1149.14	55.95	1093.19	56.58	1092.56
MW-82B	Shallow	1149.12	55.92	1093.20	56.56	1092.56
MW-82D	Bedrock	1149.22	55.89	1093.33	56.40	1092.82
MW-83A	Intermed.	1152.41	62.06	1090.35	62.55	1089.86
MW-83B	Shallow	1152.28	62.02	1090.26	62.47	1089.81
MW-83D	Bedrock	1152.32	62.05	1090.27	62.53	1089.79
MW-84A	Intermed.	1145.34	56.06	1089.28	56.49	1088.85
MW-84AR	Intermed.	1145.26	55.98	1089.28	56.42	1088.84
MW-84B	Shallow	1145.62	55.89	1089.73	56.28	1089.34
MW-84D	Bedrock	1145.37	64.25	1081.12	56.71	1088.66
MW-85A	Intermed.	1132.58	47.82	1084.76	48.30	1084.28
MW-85B	Shallow	1132.39	47.61	1084.78	48.13	1084.26
MW-85D	Bedrock	1132.59	47.85	1084.74	48.35	1084.24
MW-89A	Intermed.	1160.99	58.56	1102.43	58.98	1102.01
MW-89B	Shallow	1161.37	59.07	1102.30	59.51	1101.86
MW-89D	Bedrock	1160.65	58.17	1102.48	58.60	1102.05
MW-90A	Intermed.	1151.11	48.07	1103.04	48.61	1102.50
MW-90B	Shallow	1150.77	48.08	1102.69	48.67	1102.10
MW-90D	Bedrock	1151.44	48.56	1102.88	49.09	1102.35
MW-91A	Intermed.	1152.04	49.23	1102.81	49.90	1102.14
MW-91B	Shallow	1151.87	49.25	1102.62	49.91	1101.96
MW-91D	Bedrock	1151.95	49.24	1102.71	49.82	1102.13

Table 2-3
Groundwater Elevations, March 2006 and October 2006
Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Sample ID	Depth Desig-nation	Top of Casing Elev. (ft AMSL, NAVD88)	March 29, 2006 Depth to Water from TOC (ft)	March 29, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)	October 30, 2006 Depth to Water from TOC (ft)	October 30, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)
MW-92A	Intermed.	1108.78	10.14	1098.64	10.22	1098.56
MW-92B	Shallow	1108.65	9.91	1098.74	10.02	1098.63
MW-93A	Intermed.	1124.26	22.65	1101.61	23.31	1100.95
MW-93B	Shallow	1123.90	23.36	1100.54	22.99	1100.91
OW-01	NA	1162.06	NM	NM	53.86	1108.20
OW-02	NA	1161.66	NM	NM	52.70	1108.96
OW-03	NA	1161.71	NM	NM	53.26	1108.45
OW-04	NA	1161.81	NM	NM	54.36	1107.45
OW-05	NA	1081.34	NM	NM	11.20	1070.14
OW-06	NA	1079.41	NM	NM	8.20	1071.21
OW-07	NA	1079.22	NM	NM	7.40	1071.82
OW-08	NA	1078.56	NM	NM	6.25	1072.31
OW-09	NA	1081.19	NM	NM	9.77	1071.42
OW-10	NA	1079.87	NM	NM	NM	NM
OW-11	NA	1078.42	NM	NM	7.51	1070.91
OW-12	NA	1079.79	NM	NM	6.06	1073.73
OW-13	NA	1081.25	8.92	1072.33	9.94	1071.31
OW-14	NA	1080.39	7.31	1073.08	8.05	1072.34
OW-15	NA	1080.42	7.18	1073.24	7.74	1072.68
OW-16	NA	1077.59	NM	NM	3.00	1074.59
OW-17	NA	1161.58	51.11	1110.47	51.62	1109.96
OW-18	NA	1162.21	51.01	1111.20	51.52	1110.69
OW-19	NA	1172.28	58.81	1113.47	59.40	1112.88
OW-20	NA	1162.79	53.47	1109.32	53.95	1108.84
OW-21	NA	1159.81	49.75	1110.06	50.23	1109.58
OW-22	NA	1161.24	50.42	1110.82	50.29	1110.95
OW-23	NA	1162.08	49.82	1112.26	50.29	1111.79
OW-24	NA	1153.07	70.28	1082.79	70.76	1082.31
OW-25	NA	1155.71	72.57	1083.14	73.06	1082.65
OW-26	NA	1148.64	NM	NM	NM	NM
OW-27	NA	1153.30	70.45	1082.85	70.93	1082.37
OW-28	NA	1153.81	70.92	1082.89	71.40	1082.41
OW-30	NA	1131.58	48.10	1083.48	48.63	1082.95
OW-31	NA	1155.78	66.12	1089.66	66.35	1089.43
OW-32	NA	1153.87	63.42	1090.45	63.74	1090.13
OW-33	NA	1154.67	63.76	1090.91	64.17	1090.50
OW-34	NA	1154.70	65.68	1089.02	65.94	1088.76
OW-35	NA	1154.10	63.67	1090.43	64.02	1090.08
OW-36	NA	1157.23	66.81	1090.42	67.20	1090.03
OW-37	NA	1157.74	65.77	1091.97	66.14	1091.60
OW-38	NA	1151.19	65.00	1086.19	65.46	1085.73
OW-39	NA	1151.39	62.68	1088.71	63.13	1088.26
OW-40	NA	1157.66	67.15	1090.51	67.59	1090.07

Table 2-3
Groundwater Elevations, March 2006 and October 2006
Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Sample ID	Depth Desig-nation	Top of Casing Elev. (ft AMSL, NAVD88)	March 29, 2006 Depth to Water from TOC (ft)	March 29, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)	October 30, 2006 Depth to Water from TOC (ft)	October 30, 2006 Groundwater Elevation (ft AMSL, NAVD88 ft)
OW-41	NA	1150.22	65.06	1085.16	65.57	1084.65
OW-42	NA	1151.21	63.49	1087.72	63.93	1087.28
OW-43	NA	1156.74	67.02	1089.72	67.49	1089.25
OW-44	NA	1147.84	57.85	1089.99	58.36	1089.48
OW-45	NA	1152.47	62.86	1089.61	63.65	1088.82
OW-46	NA	1151.55	59.26	1092.29	59.95	1091.60
OW-47	NA	1153.44	59.33	1094.11	59.97	1093.47
OW-48	NA	1153.38	63.13	1090.25	63.91	1089.47
OW-49	NA	1154.09	62.45	1091.64	63.12	1090.97
OW-50	NA	1151.16	58.65	1092.51	59.20	1091.96
OW-51	NA	1149.86	57.62	1092.24	NM	NM
OW-52	NA	1107.14	15.88	1091.26	16.12	1091.02
OW-53	NA	1107.13	14.14	1092.99	14.36	1092.77
OW-54	NA	1115.39	14.60	1100.79	15.09	1100.30
OW-55	NA	1107.05	16.79	1090.26	17.30	1089.75
OW-56	NA	1112.15	11.61	1100.54	12.13	1100.02
OW-57	NA	1114.84	14.01	1100.83	14.56	1100.28
OW-58	NA	1109.00	10.38	1098.62	10.71	1098.29
OW-59	NA	1110.50	10.90	1099.60	11.30	1099.20
TH-EW-12	NA	1107.37	28.46	1078.91	28.72	1078.65
TH-EW-13	NA	1111.04	11.58	1099.46	11.99	1099.05

Note:

(1) MW-17A, B & C top of risers were cut to accommodate new protectors after the March water level measurement and before the October water level measurement. Top of Casing elevation is for October.

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-01A	2618459.72	511743.03	I	1176.88	1174.40	79.00	1095.40	109.00	1065.40	109.00	1065.40	SH
MW-01B	2618469.56	511743.23	S	1176.73	1174.21	39.00	1135.21	79.00	1095.21	NP	NP	NP
MW-02A	2606800.10	506250.32	I	1174.77	1172.62	67.70	1104.92	96.90	1075.72	99.50	1073.12	SS
MW-02B	2606808.90	506255.48	S	1175.18	1172.73	34.30	1138.43	63.50	1109.23	NP	NP	NP
MW-03A	2607532.26	506223.42	I	1179.56	1177.65	97.00	1080.65	145.80	1031.85	146.00	1031.65	SH
MW-03B	2607542.05	506225.42	S	1179.83	1177.60	39.90	1137.70	98.40	1079.20	NP	NP	NP
MW-04A	2612041.94	506256.77	I	1168.73	1166.51	74.20	1092.31	103.50	1063.01	103.50	1063.01	SH
MW-04B	2612051.44	506259.36	S	1168.85	1166.43	32.10	1134.33	71.20	1095.23	NP	NP	NP
MW-05A	2613044.09	507097.63	I	1168.12	1166.10	61.80	1104.30	100.80	1065.30	100.80	1065.30	SH
MW-05B	2613053.87	507097.47	S	1168.18	1165.88	30.00	1135.88	59.30	1106.58	NP	NP	NP
MW-06A	2617375.69	506522.12	I	1165.46	1163.40	61.00	1102.40	100.00	1063.40	100.00	1063.40	SH
MW-06B	2617384.61	506525.48	S	1165.61	1163.55	34.80	1128.75	64.00	1099.55	NP	NP	NP
MW-07A	2618267.10	507274.83	I	1164.85	1162.69	70.20	1092.49	99.50	1063.19	99.50	1063.19	SH
MW-07B	2618276.53	507276.12	S	1164.64	1162.34	34.70	1127.64	73.70	1088.64	NP	NP	NP
MW-08A	2622863.97	506814.76	I	1165.92	1163.62	84.00	1079.62	123.00	1040.62	123.00	1040.62	SS
MW-08B	2622872.08	506820.56	S	1165.92	1163.60	42.10	1121.50	81.00	1082.60	NP	NP	NP
MW-09A	2623570.81	507435.84	I	1171.46	1168.78	89.00	1079.78	128.00	1040.78	127.70	1041.08	SS
MW-09B	2623580.33	507436.09	S	1171.60	1169.00	46.30	1122.70	85.30	1083.70	NP	NP	NP
MW-09D	2623593.10	507436.00	D	1171.28	1169.31	131.00	1038.31	136.00	1033.31	121.60	1047.71	SS
MW-10A	2607883.83	496858.27	I	1150.35	1147.91	61.40	1086.51	100.40	1047.51	100.00	1047.91	SS
MW-10B	2607893.74	496858.92	S	1150.31	1147.74	33.00	1114.74	62.20	1085.54	NP	NP	NP
MW-11	2626486.32	509499.80	S/I	1153.22	1150.76	18.80	1131.96	48.00	1102.76	48.00	1102.76	SS
MW-12	2606856.25	509013.88	S/I	1178.55	1176.27	27.60	1148.67	37.30	1138.97	35.50	1140.77	SS
MW-13	2612231.38	509178.55	S	1175.20	1172.84	29.50	1143.34	39.20	1133.64	NP	NP	NP
MW-14	2617504.71	509391.07	S	1178.94	1176.80	38.60	1138.20	48.30	1128.50	NP	NP	NP
MW-15	2622745.33	509482.90	S	1170.06	1167.71	37.00	1130.71	46.70	1121.01	NP	NP	NP
MW-16B	2604911.66	514026.38	I	1188.68	1186.48	NA	NA	NA	NA	106.80	1079.68	SH
MW-16C	2604917.63	514034.74	S	1189.40	1186.74	31.50	1155.24	41.50	1145.24	NP	NP	NP
MW-17A	2603293.03	499100.33	D	1128.60	1126.40	72.10	1054.30	77.10	1049.30	57.00	1069.40	SH
MW-17B	2603293.03	499101.48	I	1128.50	1126.20	50.40	1075.80	55.80	1070.40	56.80	1069.40	SH
MW-17C	2603293.48	499090.31	S	1128.40	1126.20	7.20	1119.00	17.20	1109.00	NP	NP	NP

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-18A	2629150.33	506832.34	D	1145.43	1142.80	122.00	1020.80	125.00	1017.80	100.80	1042.00	SS/SH
MW-18B	2629156.57	506827.46	I	1145.57	1142.96	NA	NA	NA	NA	NP	NP	NP
MW-18C	2629148.53	506821.93	S	1146.05	1143.38	36.70	1106.68	46.70	1096.68	NP	NP	NP
MW-19A	2618421.42	517577.13	D	1158.65	1156.25	125.00	1031.25	128.00	1028.25	115.00	1041.25	SH/SS
MW-19B	2618429.63	517576.97	I	1158.59	1156.27	98.00	1058.27	103.00	1053.27	104.20	1052.07	SH
MW-19C	2618426.14	517568.83	S	1159.26	1156.64	10.20	1146.44	20.25	1136.39	NP	NP	NP
MW-20A	2616622.54	493189.94	D	1160.42	1157.97	145.00	1012.97	150.40	1007.57	138.50	1019.47	SS
MW-20B	2616633.43	493191.47	I	1160.29	1157.72	128.60	1029.12	133.60	1024.12	111.60	1046.12	SS/SH
MW-20C	2616611.43	493187.61	S	1160.29	1157.84	50.30	1107.54	60.30	1097.54	NP	NP	NP
MW-21A	2607121.37	503524.81	I	1165.63	1163.72	116.00	1047.72	126.00	1037.72	NP	NP	NP
MW-21B	2607111.29	503524.05	S	1165.59	1163.67	66.00	1097.67	76.00	1087.67	NP	NP	NP
MW-21D	2607131.41	503525.83	D	1165.57	1163.67	133.00	1030.67	138.00	1025.67	127.30	1036.37	SH/SS
MW-22A	2606598.39	510402.07	I	1176.78	1174.93	87.80	1087.13	97.80	1077.13	99.50	1075.43	SH
MW-22B	2606604.48	510403.43	S	1176.67	1174.81	58.00	1116.81	68.00	1106.81	NP	NP	NP
MW-23A	2606402.57	509376.37	I	1173.56	1171.88	88.50	1083.38	98.50	1073.38	99.30	1072.58	SH
MW-23B	2606393.06	509383.87	S	1173.93	1172.05	67.50	1104.55	77.50	1094.55	NP	NP	NP
MW-24A	2608476.90	501919.83	I	1163.41	1161.37	111.50	1049.87	121.50	1039.87	125.00	1036.37	SH
MW-24B	2608477.73	501909.01	S	1163.46	1161.27	56.00	1105.27	66.00	1095.27	NP	NP	NP
MW-25A	2608308.41	504875.16	I	1175.25	1173.23	145.00	1028.23	155.00	1018.23	NP	NP	NP
MW-25B	2608308.27	504885.58	S	1174.71	1172.93	74.00	1098.93	84.00	1088.93	NP	NP	NP
MW-25D	2608308.83	504864.77	D	1175.46	1173.54	163.20	1010.34	168.20	1005.34	156.80	1016.74	SS
MW-26A	2609860.44	508825.09	I	1174.15	1172.44	92.50	1079.94	102.50	1069.94	103.80	1068.64	SS/SH
MW-26B	2609849.90	508824.87	S	1174.16	1172.42	66.00	1106.42	76.00	1096.42	NP	NP	NP
MW-27A	2611434.64	508103.04	I	1176.05	1174.14	96.00	1078.14	106.00	1068.14	106.80	1067.34	SH
MW-27B	2611427.01	508110.55	S	1176.06	1174.12	61.50	1112.62	71.50	1102.62	NP	NP	NP
MW-28A	2612951.02	502242.71	I	1172.22	1170.29	127.60	1042.69	137.60	1032.69	138.00	1032.29	SS
MW-28B	2612936.01	502242.26	S	1172.52	1170.43	67.50	1102.93	77.50	1092.93	NP	NP	NP
MW-28D	2612969.60	502242.92	D	1171.99	1169.84	144.00	1025.84	149.00	1020.84	138.00	1031.84	SS
MW-29A	2614469.84	498383.11	I	1160.06	1158.50	122.60	1035.90	132.60	1025.90	137.10	1021.40	SH
MW-29B	2614460.98	498382.37	S	1161.03	1158.75	64.50	1094.25	74.50	1084.25	NP	NP	NP
MW-30A	2616288.05	507064.55	I	1168.55	1166.61	94.00	1072.61	99.00	1067.61	101.50	1065.11	SH/SS

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-30B	2616281.84	507065.86	S	1168.38	1166.45	59.50	1106.95	69.50	1096.95	NP	NP	NP
MW-31A	2617943.95	503233.70	I	1167.38	1165.35	94.50	1070.85	104.50	1060.85	106.00	1059.35	SH
MW-31B	2617935.17	503238.63	S	1166.95	1165.06	50.00	1115.06	60.00	1105.06	NP	NP	NP
MW-32A	2619697.25	499062.26	I	1154.17	1152.35	88.50	1063.85	98.50	1053.85	99.55	1052.80	SH
MW-32B	2619696.91	499069.08	S	1154.10	1152.31	71.00	1081.31	81.00	1071.31	NP	NP	NP
MW-32D	2619697.54	499055.63	D	1154.02	1152.07	106.50	1045.57	111.50	1040.57	99.50	1052.57	SH
MW-33A	2622410.84	502847.91	I	1160.32	1158.43	100.50	1057.93	110.50	1047.93	NP	NP	NP
MW-33B	2622401.05	502854.78	S	1160.37	1158.53	73.50	1085.03	83.50	1075.03	NP	NP	NP
MW-33D	2622421.53	502856.97	D	1160.24	1158.29	120.00	1038.29	125.00	1033.29	116.50	1041.79	SS
MW-34A	2624442.78	498806.30	I	1156.79	1155.05	102.00	1053.05	112.00	1043.05	113.00	1042.05	SS
MW-34B	2624443.06	498814.11	S	1157.00	1155.00	65.00	1090.00	75.00	1080.00	NP	NP	NP
MW-34D	2624442.36	498796.40	D	1156.73	1154.83	120.00	1034.83	125.00	1029.83	112.90	1041.93	SS
MW-35A	2629595.76	496323.64	I	1139.81	1137.80	81.50	1056.30	91.50	1046.30	NP	NP	NP
MW-35B	2629595.84	496329.37	S	1139.57	1137.76	57.00	1080.76	67.00	1070.76	NP	NP	NP
MW-35D	2629595.80	496317.10	D	1139.67	1137.78	100.50	1037.28	105.50	1032.28	93.00	1044.78	SS
MW-36A	2634814.84	496694.95	I	1076.62	1076.84	28.00	1048.84	38.00	1038.84	NP	NP	NP
MW-36B	2634805.75	496692.86	S	1076.65	1076.80	17.00	1059.80	27.00	1049.80	NP	NP	NP
MW-36D	2634824.46	496697.59	D	1076.79	1076.93	43.00	1033.93	48.00	1028.93	39.00	1037.93	SS
MW-37A	2633418.32	491651.94	I	1085.20	1083.05	30.50	1052.55	40.50	1042.55	41.40	1041.65	SS
MW-37B	2633416.51	491631.65	S	1085.19	1083.07	24.00	1059.07	29.00	1054.07	NP	NP	NP
MW-37D	2633413.67	491666.00	D	1085.06	1082.98	45.50	1037.48	50.50	1032.48	41.50	1041.48	SS
MW-38A	2638131.88	496248.57	I	1082.32	1079.98	44.70	1035.28	49.20	1030.78	49.20	1030.78	SS
MW-38D	2638138.80	496250.60	D	1081.92	1079.98	58.50	1021.48	63.50	1016.48	49.20	NA	SS
MW-39A	2640060.00	499307.00	I	1082.82	1081.00	44.00	1037.00	48.50	1032.50	48.50	1032.50	SS
MW-39D	2640059.10	499298.90	D	1082.95	1081.00	52.50	1028.50	55.30	1025.70	48.50	NA	SS/SH
MW-40A	2623018.62	511963.35	I	1172.09	1170.09	120.50	1049.59	125.50	1044.59	127.60	1042.49	SS/SH
MW-40B	2623006.75	511962.76	S	1172.34	1170.38	54.00	1116.38	64.00	1106.38	NP	NP	NP
MW-41A	2624371.47	512001.33	I	1168.63	1166.32	71.50	1094.82	81.50	1084.82	82.30	1084.02	SS
MW-41B	2624361.83	512001.37	S	1168.68	1166.27	36.00	1130.27	46.00	1120.27	NP	NP	NP
MW-41D	2624353.22	512000.98	D	1168.61	1166.41	87.00	1079.41	92.00	1074.41	82.00	1084.41	SS
MW-42A	2629385.20	501582.56	I	1146.53	1144.54	86.00	1058.54	96.00	1048.54	NP	NP	NP

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-42B	2629385.28	501592.64	S	1146.64	1144.51	53.00	1091.51	63.00	1081.51	NP	NP	NP
MW-42D	2629384.99	501572.17	D	1146.20	1144.41	103.20	1041.21	108.20	1036.21	97.80	1046.61	SS
MW-43A	2629243.07	504317.91	I	1142.90	1141.02	90.50	1050.52	100.50	1040.52	NP	NP	NP
MW-43B	2629244.24	504328.20	S	1142.74	1140.90	40.00	1100.90	50.00	1090.90	NP	NP	NP
MW-43D	2629242.21	504308.09	D	1142.95	1140.95	106.40	1034.55	111.40	1029.55	101.50	1039.45	SS
MW-44A	2632953.68	500415.12	I	1093.68	1091.91	29.50	1062.41	39.50	1052.41	NP	NP	NP
MW-44B	2632954.90	500426.32	S	1092.46	1090.62	16.00	1074.62	26.00	1064.62	NP	NP	NP
MW-44D	2632952.84	500403.76	D	1094.20	1092.31	50.80	1041.51	55.80	1036.51	44.00	1048.31	SS
MW-45A	2635043.54	499241.12	I	1081.53	1079.57	28.00	1051.57	38.00	1041.57	NP	NP	NP
MW-45B	2635053.92	499241.15	S	1081.54	1079.54	17.00	1062.54	27.00	1052.54	NP	NP	NP
MW-45D	2635032.46	499241.76	D	1081.44	1079.66	43.00	1036.66	48.00	1031.66	39.00	1040.66	SS
MW-46A	2637464.94	499387.37	I	1082.70	1080.71	33.20	1047.51	43.20	1037.51	47.50	1033.21	NA
MW-46B	2637464.42	499396.68	S	1082.81	1080.77	21.00	1059.77	31.00	1049.77	NP	NP	NP
MW-46D	2637465.40	499375.99	D	1082.65	1080.71	52.50	1028.21	57.50	1023.21	47.50	1033.21	SS
MW-47A	2603834.71	524480.73	I	1201.73	1199.76	112.80	1086.96	122.80	1076.96	126.00	1073.76	SH
MW-47B	2603819.42	524480.21	S	1201.67	1199.77	74.80	1124.97	84.80	1114.97	NP	NP	NP
MW-48A (Abandoned)	2607436.75	519363.04	I	1193.44	1191.36	110.70	1080.66	120.70	1070.66	122.00	1069.36	SS
MW-48B (Abandoned)	2607442.66	519367.88	S	1193.35	1191.35	73.00	1118.35	83.00	1108.35	NP	NP	NP
MW-48D (Abandoned)	2607427.86	519358.29	D	1193.65	1191.64	125.50	1066.14	130.50	1061.14	119.40	1072.24	SS
MW-52A	2627012.55	508784.57	I	1155.22	1153.51	48.00	1105.51	58.00	1095.51	60.00	1093.51	SH
MW-52B	2627004.24	508778.94	S	1155.65	1153.91	42.50	1111.41	52.50	1101.41	NP	NP	NP
MW-53A	2627897.77	508169.88	I	1136.36	1134.42	87.00	1047.42	97.00	1037.42	99.90	1034.52	SS
MW-53B	2627885.40	508166.61	S	1136.91	1134.89	27.50	1107.39	37.50	1097.39	NP	NP	NP
MW-54A	2627893.82	508858.25	I	1121.58	1119.72	66.00	1053.72	76.00	1043.72	81.50	1038.22	SS
MW-54B	2627883.88	508855.98	S	1121.59	1119.72	24.00	1095.72	29.00	1090.72	NP	NP	NP
MW-55A	2628135.40	508377.66	I	1126.49	1124.52	74.00	1050.52	84.00	1040.52	85.00	1039.52	SS
MW-55B	2628125.88	508374.22	S	1127.27	1125.08	56.00	1069.08	66.00	1059.08	NP	NP	NP
MW-56A	2628206.01	508215.32	I	1125.96	1124.17	69.00	1055.17	79.00	1045.17	81.00	1043.17	SS
MW-56B	2628195.32	508217.29	S	1126.24	1124.44	21.00	1103.44	31.00	1093.44	NP	NP	NP
MW-57B	2607621.51	516363.44	S	1196.27	1194.32	55.00	1139.32	65.00	1129.32	NP	NP	NP
MW-58A (Abandoned)	2620357.49	515008.03	I	1175.37	1173.48	122.50	1050.98	132.50	1040.98	135.00	1038.48	SS/SH

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-58B (Abandoned)	2620346.02	515009.76	S	1175.39	1173.40	70.70	1102.70	80.70	1092.70	134.00	1039.40	SS
MW-59A (Abandoned)	2621708.41	515882.45	I	1162.95	1161.06	113.10	1047.96	123.10	1037.96	NP	NP	NP
MW-59B (Abandoned)	2621700.91	515887.73	S	1163.04	1161.29	38.00	1123.29	48.00	1113.29	NP	NP	NP
MW-59D (Abandoned)	2621717.33	515878.49	D	1162.57	1160.85	132.20	1028.65	137.20	1023.65	125.00	1035.85	SS
MW-60A	2624702.83	489585.15	I	1145.83	1143.95	92.00	1051.95	102.00	1041.95	102.50	1041.45	SH
MW-60B	2624703.22	489598.70	S	1146.15	1144.12	70.00	1074.12	80.00	1064.12	NP	NP	NP
MW-61A	2608656.02	492900.05	I	1108.96	1106.91	75.70	1031.21	85.70	1021.21	NP	NP	NP
MW-61B	2608644.38	492898.60	S	1108.96	1106.84	25.00	1081.84	35.00	1071.84	NP	NP	NP
MW-61D	2608667.93	492901.85	D	1108.96	1106.85	97.00	1009.85	102.00	1004.85	87.50	1019.35	SH
MW-62A	2635396.62	493874.24	I	1078.66	1076.62	27.00	1049.62	37.00	1039.62	NP	NP	NP
MW-62B	2635385.06	493871.95	S	1078.57	1076.52	17.00	1059.52	24.00	1052.52	NP	NP	NP
MW-62D	2635407.14	493876.96	D	1078.89	1076.90	44.00	1032.90	49.00	1027.90	37.60	1039.30	SS
MW-63B	2613167.91	519473.60	S	1177.45	1175.66	18.50	1157.16	28.50	1147.16	NP	NP	NP
MW-64B	2628038.55	510106.02	S	1144.20	1142.35	19.00	1123.35	29.00	1113.35	NP	NP	NP
MW 65A	2613203.05	506090.52	I	1163.99	1164.83	92.50	1072.33	102.50	1062.33	NA	NA	NA
MW 65B	2613193.30	506091.23	S	1164.02	1164.86	35.40	1129.46	65.40	1099.46	NA	NA	NA
MW 66A	2613278.51	506026.73	I	1163.09	1163.93	89.00	1074.93	99.00	1064.93	NA	NA	NA
MW 66B	2613268.32	506027.61	S	1163.08	1163.92	34.00	1129.92	64.00	1099.92	NA	NA	NA
MW 67A	2613306.23	506004.48	I	1162.44	1163.28	88.00	1075.28	98.00	1065.28	NA	NA	NA
MW 67B	2613314.55	505999.49	S	1162.68	1163.52	34.00	1129.52	64.00	1099.52	NA	NA	NA
MW 68B	2613320.78	506024.53	S	1164.06	1164.90	36.00	1128.90	66.00	1098.90	NA	NA	NA
MW 69B	2613341.62	506046.74	S	1165.08	1165.92	36.00	1129.92	66.00	1099.92	NA	NA	NA
MW 70B	2613362.30	506068.63	S	1165.27	1166.11	36.00	1130.11	66.00	1100.11	NA	NA	NA
MW 71B	2613382.62	506090.27	S	1165.38	1166.22	36.00	1130.22	66.00	1100.22	NA	NA	NA
MW 72A	2622930.98	512064.69	I	1170.37	1171.21	88.00	1083.21	108.00	1063.21	NA	NA	NA
MW 72B	2622921.73	512064.19	S	1169.92	1170.76	40.00	1130.76	70.00	1100.76	NA	NA	NA
MW 73A	2623060.93	511909.15	I	1166.95	1167.79	88.00	1079.79	108.00	1059.79	NA	NA	NA
MW 73B	2623052.30	511908.70	S	1166.90	1167.74	40.00	1127.74	70.00	1097.74	NA	NA	NA
MW 74A	2623093.85	511934.84	I	1166.94	1167.78	88.10	1079.68	108.10	1059.68	NA	NA	NA
MW 74B	2623085.26	511934.80	S	1167.04	1167.88	40.00	1127.88	70.00	1097.88	NA	NA	NA
MW 75A	2623130.00	511962.35	I	1167.13	1167.97	87.10	1080.87	107.10	1060.87	NA	NA	NA

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW 75B	2623120.34	511961.81	S	1167.30	1168.14	40.00	1128.14	70.00	1098.14	NA	NA	NA
MW 76A	2623158.64	511983.32	I	1166.24	1167.08	88.00	1079.08	108.50	1058.58	NA	NA	NA
MW 76B	2623148.91	511982.59	S	1166.48	1167.32	40.50	1126.82	70.50	1096.82	NA	NA	NA
MW 77A	2623192.11	512008.01	I	1165.73	1166.57	83.50	1083.07	103.50	1063.07	NA	NA	NA
MW 77B	2623180.56	512007.28	S	1165.79	1166.63	40.00	1126.63	70.00	1096.63	NA	NA	NA
MW 78A	2623223.84	512032.75	I	1165.27	1166.11	85.00	1081.11	105.00	1061.11	NA	NA	NA
MW 78B	2623213.77	512031.30	S	1165.35	1166.19	40.00	1126.19	70.00	1096.19	NA	NA	NA
MW-79A	2610432.14	492336.21	I	1109.34	1107.15	76.00	1031.15	86.00	1021.15	85.70	1021.45	SH
MW-79B	2610428.14	492345.18	S	1109.39	1107.17	30.20	1076.97	40.20	1066.97	NA	NA	NA
MW-80A	2610925.54	492067.12	I	1107.43	1105.27	69.17	1036.10	79.17	1026.10	82.50	1022.77	SS
MW-80B	2610916.24	492064.59	S	1107.65	1105.46	30.00	1075.46	40.00	1065.46	NA	NA	NA
MW-80D	2610935.55	492068.65	D	1107.40	1105.22	87.70	1017.52	92.70	1012.52	82.50	1022.72	SS
MW-81A	2611637.99	492369.38	I	1108.48	1106.30	79.00	1027.30	92.00	1014.30	94.20	1012.10	SS
MW-81B	2611635.91	492360.36	S	1108.47	1106.29	28.20	1078.09	38.20	1068.09	NP	NP	NP
MW-81D	2611633.37	492349.85	D	1108.53	1106.40	99.10	1007.30	104.10	1002.30	94.20	1012.20	SS
MW-82A	2619288.65	493318.05	I	1149.14	1147.10	89.50	1057.60	94.50	1052.60	NP	NP	NP
MW-82B	2619284.94	493325.47	S	1149.12	1147.20	61.20	1086.00	65.70	1081.50	NP	NP	NP
MW-82D	2619293.00	493310.90	D	1149.22	1147.10	120.00	1027.10	125.00	1022.10	112.00	1035.10	SS
MW-83A	2621924.08	495274.66	I	1152.41	1150.20	103.50	1046.70	108.50	1041.70	NP	NP	NP
MW-83B	2621921.79	495302.77	S	1152.28	1150.40	75.00	1075.40	80.00	1070.40	NP	NP	NP
MW-83D	2621922.97	495288.85	D	1152.32	1150.30	116.00	1034.30	121.00	1029.30	111.00	1039.30	SS
MW-84A	2624277.77	495685.51	I	1145.34	1143.20	87.13	1056.07	91.13	1052.07	NP	NP	NP
MW-84AR	2624273.89	495704.26	I	1145.26	1143.20	97.50	1045.70	102.50	1040.70	102.50	1040.70	SS
MW-84B	2624272.04	495712.90	S	1145.62	1143.30	66.50	1076.80	71.50	1071.80	NP	NP	NP
MW-84D	2624275.75	495695.58	D	1145.37	1143.20	103.50	1039.70	108.50	1034.70	97.50	1045.70	SS
MW-85A	2628326.53	494439.02	I	1132.58	1130.50	81.00	1049.50	86.00	1044.50	86.00	1044.50	SS
MW-85B	2628315.15	494449.81	S	1132.39	1130.40	62.00	1068.40	67.00	1063.40	NP	NP	NP
MW-85D	2628338.54	494428.03	D	1132.59	1130.40	90.00	1040.40	95.00	1035.40	84.50	1045.90	SS
MW-86A	2631939.21	493759.74	I	1114.15	1111.78	52.50	1059.28	62.50	1049.28	NP	NP	NP
MW-86B	2631933.61	493758.65	S	1114.58	1112.08	43.00	1069.08	53.00	1059.08	NP	NP	NP
MW-86D	2631944.47	493760.43	D	1113.90	1111.48	68.98	1042.50	74.50	1036.98	63.00	1048.48	SS

Table 2-4
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Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-87A	2635039.81	491898.03	I	1078.38	1075.83	36.00	1039.83	46.00	1029.83	NP	NP	NP
MW-87B	2635035.21	491900.97	S	1078.38	1075.83	17.00	1058.83	27.00	1048.83	NP	NP	NP
MW-87D	2635044.01	491895.21	D	1078.39	1075.83	50.10	1025.73	55.60	1020.23	46.00	1029.83	SS
MW-88A	2637643.92	494045.13	I	1081.22	1078.71	35.00	1043.71	45.00	1033.71	NP	NP	NP
MW-88B	2637639.18	494044.21	S	1081.27	1078.71	20.00	1058.71	30.00	1048.71	NP	NP	NP
MW-88D	2637648.62	494046.08	D	1081.30	1078.71	50.50	1028.21	55.50	1023.21	45.00	1033.71	SS
MW-89A	2610430.84	494253.88	I	1160.99	1158.81	129.20	1029.61	139.20	1019.61	NP	NP	NP
MW-89B	2610408.69	494254.10	S	1161.37	1159.20	65.00	1094.20	75.70	1083.50	NP	NP	NP
MW-89D	2610451.41	494254.27	D	1160.65	1158.55	145.00	1013.55	150.60	1007.95	125.00	NP	SS
MW-90A	2611235.54	494302.04	I	1151.11	1148.94	112.20	1036.74	123.40	1025.54	NP	NP	NP
MW-90B	2611226.60	494297.96	S	1150.77	1148.60	65.35	1083.25	75.45	1073.15	NP	NP	NP
MW-90D	2611244.85	494306.05	D	1151.44	1149.25	130.20	1019.05	135.20	1014.05	125.20	1024.05	SS
MW-91A	2612076.97	494323.00	I	1152.04	1149.85	109.20	1040.65	119.20	1030.65	NP	NP	NA
MW-91B	2612067.85	494317.53	S	1151.87	1149.66	67.60	1082.06	77.60	1072.06	NP	NP	NA
MW-91D	2612085.70	494327.97	D	1151.95	1149.78	125.20	1024.58	130.20	1019.58	85.00	1064.78	SH
MW-92A	2610047.26	492722.58	I	1108.78	1106.58	72.16	1034.42	82.16	1024.42	82.50	1024.08	SH
MW-92B	2610047.80	492733.82	S	1108.65	1106.44	30.10	1076.34	40.10	1066.34	NP	NP	NP
MW-93A	2612162.89	493551.29	I	1124.26	1122.07	84.20	1037.87	94.20	1027.87	95.00	1027.07	SH
MW-93B	2612154.07	493546.80	S	1123.90	1121.70	60.00	1061.70	70.00	1051.70	NP	NP	NP
MW-94A	2617023.16	496428.72	I	1153.06	1150.75	84.00	1066.75	94.00	1056.75	NP	NP	NP
MW-94B	2617023.07	496434.50	S	1153.09	1150.56	64.00	1086.56	74.00	1076.56	NP	NP	NP
MW-94D	2617023.47	496422.56	D	1153.25	1150.82	115.90	1034.92	121.40	1029.42	110.50	1040.32	SH
MW-95A	2617552.81	494508.64	I	1156.81	1154.32	93.00	1061.32	103.00	1051.32	NP	NP	NP
MW-95B	2617546.97	494508.01	S	1156.46	1154.15	65.00	1089.15	75.00	1079.15	NP	NP	NP
MW-95D	2617558.46	494509.13	D	1156.82	1154.45	124.50	1029.95	129.50	1024.95	118.00	1036.45	SH
MW-96A	2621468.23	493387.73	I	1148.56	1146.00	82.50	1063.50	92.50	1053.50	NP	NP	NP
MW-96B	2621468.23	493387.80	S	1148.56	1146.00	71.00	1075.00	81.00	1065.00	NP	NP	NP
MW-96D	2621476.25	493387.89	D	1148.58	1146.00	101.50	1044.50	106.00	1040.00	96.50	1049.50	SS
MW-97A	2623938.04	493492.83	I	1143.08	1140.60	83.00	1057.60	93.00	1047.60	NP	NP	NP
MW-97B	2623932.70	493492.45	S	1143.18	1140.60	68.00	1072.60	73.00	1067.60	NP	NP	NP
MW-97D	2623943.48	493493.13	D	1143.18	1140.60	99.98	1040.62	105.50	1035.10	94.00	1046.60	SS

Table 2-4
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Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-98A	2626495.30	493604.94	I	1141.52	1139.00	82.00	1057.00	92.00	1047.00	NP	NP	NP
MW-98B	2626488.71	493605.28	S	1141.58	1139.00	64.00	1075.00	69.00	1070.00	NP	NP	NP
MW-98D	2626502.36	493605.21	D	1141.58	1139.00	97.00	1042.00	102.00	1037.00	92.00	1047.00	SS
MW-99A	2627117.43	498780.95	I	1163.04	1160.69	102.00	1058.69	112.00	1048.69	NP	NP	NP
MW-99B	2627118.41	498787.93	S	1163.19	1160.87	75.00	1085.87	85.00	1075.87	NP	NP	NP
MW-99D	2627116.78	498773.69	D	1162.76	1160.38	118.50	1041.88	123.50	1036.88	112.00	1048.38	SS
MW-100A	2629718.84	493770.41	I	1141.18	1138.60	83.00	1055.60	93.00	1045.60	94.00	1044.60	SS
MW-100B	2629718.07	493777.19	S	1141.12	1138.60	65.00	1073.60	75.00	1063.60	NP	NP	NP
MW-100D	2629718.36	493783.73	D	1141.22	1138.60	99.90	1038.70	104.90	1033.70	94.00	1044.60	SS
MW-101A	2610929.39	491574.12	I	1107.43	1104.99	83.00	1021.99	93.00	1011.99	NP	NP	NP
MW-101B	2610923.62	491573.82	S	1107.44	1104.99	30.00	1074.99	40.00	1064.99	NP	NP	SS
MW-101D	2610935.30	491574.49	D	1107.45	1104.99	90.00	1014.99	95.00	1009.99	83.00	1021.99	NP
MW-102A	2622929.38	514541.24	I	1170.90	1168.76	117.00	1051.76	127.00	1041.76	NP	NP	NP
MW-102B	2622923.37	514540.93	S	1171.13	1168.76	50.00	1118.76	60.00	1108.76	NP	NP	SS
MW-102D	2622935.91	514541.49	D	1171.08	1168.76	134.50	1034.26	139.50	1029.26	128.00	1040.76	NP
MW-103A	2623590.77	513115.79	I	1173.58	1171.11	116.00	1055.11	126.00	1045.11	NP	NP	NP
MW-103B	2623591.23	513110.25	S	1173.80	1171.36	50.00	1121.36	60.00	1111.36	NP	NP	NA
MW-103D	2623589.45	513132.90	D	1173.22	1170.78	130.00	1040.78	135.00	1035.78	NA	NA	NP
MW-106A	2630544.55	506843.26	I	1118.06	1115.50	57.00	1058.50	67.00	1048.50	NP	NP	NP
MW-106B	2630539.26	506844.10	S	1117.98	1115.50	25.00	1090.50	35.00	1080.50	NP	NP	SS
MW-106D	2630549.50	506842.72	D	1118.18	1115.50	74.00	1041.50	79.00	1036.50	68.00	1047.50	NP
MW-107A	2631375.72	506138.76	I	1135.79	1136.12	78.00	1058.12	88.00	1048.12	NP	NP	NP
MW-107B	2631374.08	506125.16	S	1136.72	1136.95	45.00	1091.95	55.00	1081.95	NP	NP	SS
MW-107D	2631375.03	506131.87	D	1136.35	1136.70	95.50	1041.20	100.50	1036.20	89.20	1047.50	NP
MW-108A	2631915.55	505912.28	I	1126.74	1126.95	71.00	1055.95	81.00	1045.95	NP	NP	NP
MW-108B	2631917.07	505899.47	S	1126.98	1127.28	35.00	1092.28	45.00	1082.28	NP	NP	SS
MW-108D	2631916.34	505906.33	D	1126.87	1127.11	88.50	1038.61	93.50	1033.61	81.50	1045.61	NP
MW-110A	2634397.71	504432.79	I	1094.10	1091.71	39.50	1052.21	44.50	1047.21	NP	NP	NP
MW-110B	2634397.16	504438.89	S	1094.49	1092.01	23.00	1069.01	28.00	1064.01	NP	NP	SS
MW-110D	2634398.64	504425.93	D	1094.36	1091.71	50.00	1041.71	55.00	1036.71	44.75	1046.96	SH
MW-112A	2637365.72	501825.77	I	1082.03	1082.38	42.50	1039.88	47.50	1034.88	48.00	1034.38	NP

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
MW-112B	2637365.30	501832.67	S	1082.02	1082.38	21.00	1061.38	26.00	1056.38	NP	NP	NP
MW-113A	2637420.11	500472.22	I	1080.47	1080.82	36.00	1044.82	41.00	1039.82	NP	NP	NP
MW-113B	2637419.51	500477.68	S	1080.42	1080.82	26.00	1054.82	31.00	1049.82	NP	NP	SS
MW-113D	2637420.34	500466.05	D	1080.49	1080.82	48.70	1032.12	53.70	1027.12	41.50	1039.32	NP
MW-114A	2637470.60	497206.93	I	1080.32	1077.87	37.00	1040.87	47.00	1030.87	NP	NP	NP
MW-114B	2637465.73	497204.32	S	1080.43	1077.87	20.00	1057.87	30.00	1047.87	NP	NP	SS
MW-114D	2637475.70	497209.79	D	1080.23	1077.87	52.44	1025.43	58.00	1019.87	48.00	1029.87	NP
MW-115A	2637702.52	495346.88	I	1081.67	1079.36	43.00	1036.36	48.00	1031.36	NP	NP	NP
MW-115B	2637696.42	495346.87	S	1081.77	1079.36	28.00	1051.36	33.00	1046.36	NP	NP	SS
MW-115D	2637708.86	495346.84	D	1081.66	1079.36	53.89	1025.47	59.40	1019.96	49.00	1030.36	NP
MW-116A	2636335.80	495297.60	I	1080.53	1078.07	37.50	1040.57	42.50	1035.57	NP	NP	SS
MW-116B	2636331.54	495297.24	S	1080.49	1078.07	27.00	1051.07	32.00	1046.07	43.00	1035.07	NP
MW-116D	2636334.22	495293.68	D	1080.46	1078.07	47.98	1030.09	53.50	1024.57	NP	NP	NP
MW-117A	2631041.42	495048.00	I	1122.26	1122.36	66.00	1056.36	76.00	1046.36	NP	NP	NP
MW-117B	2631040.50	495053.98	S	1122.06	1122.36	43.00	1079.36	53.00	1069.36	NP	NP	SS
MW-117D	2631042.35	495042.20	D	1122.41	1122.36	81.50	1040.86	86.50	1035.86	76.00	1046.36	SH
MW-118A	2625890.45	496207.70	I	1138.80	1136.41	84.75	1051.66	95.25	1041.16	97.00	1039.41	NP
MW-118B	2625884.54	496207.84	S	1138.84	1137.68	70.00	1067.68	75.00	1062.68	NP	NP	SH
TH-EW-12	2610738.32	493102.14	I	1107.37	1105.17	57.17	1048.00	87.50	1017.67	90.50	1014.67	SH
TH-EW-13	2611511.12	493072.65	I	1111.04	1108.85	53.50	1055.35	83.83	1025.02	84.00	1024.85	NP
NLF-MW01S	2627482.80	508537.55	S	1151.59	1148.91	34.40	1114.51	44.40	1104.51	NP	NP	SH
NLF-MW01I	2627492.64	508537.67	I	1151.47	1148.90	54.40	1094.50	64.40	1084.50	63.20	1085.70	NP
NLF-MW02S	2627651.96	508654.32	S	1146.71	1144.07	30.00	1114.07	40.00	1104.07	NP	NP	SH
NLF-MW02I	2627655.27	508651.08	I	1146.66	1143.97	48.20	1095.77	58.20	1085.77	57.20	1086.77	NP
NLF-MW03S	2627718.61	508563.28	S	1149.38	1146.67	33.40	1113.27	43.40	1103.27	NP	NP	SH
NLF-MW03I	2627718.46	508576.40	I	1148.89	1146.21	52.40	1093.81	62.40	1083.81	62.00	1084.21	NP
NLF-MW04S	2627719.69	508471.47	S	1151.54	1148.83	34.60	1114.23	44.60	1104.23	NP	NP	SH
NLF-MW04I	2627719.58	508481.31	I	1151.22	1148.63	46.50	1102.13	56.50	1092.13	56.00	1092.63	NP
NLF-MW05S	2627687.94	508382.55	S	1149.23	1146.51	34.20	1112.31	44.20	1102.31	NP	NP	SH
NLF-MW05I	2627691.34	508372.75	I	1148.65	1146.03	44.20	1101.83	54.20	1091.83	59.70	1086.33	NP
NLF-MW06S	2627629.12	508365.46	S	1150.94	1148.24	35.20	1113.04	42.20	1106.04	NP	NP	SH

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
NLF-MW06I	2627639.03	508359.02	I	1150.51	1147.88	52.40	1095.48	62.40	1085.48	62.10	1085.78	NP
NLF-MW07S	2627553.24	508403.93	S	1152.38	1149.79	38.00	1111.79	48.00	1101.79	NP	NP	SH
NLF-MW07I	2627559.79	508404.00	I	1152.38	1149.72	55.30	1094.42	65.30	1084.42	64.70	1085.02	NP
NPR-MW01S	2626816.17	504709.21	S	1150.69	1148.19	46.10	1102.09	56.10	1092.09	NP	NP	SS
NPR-MW01I	2626822.73	504709.28	I	1150.61	1147.90	81.10	1066.80	91.10	1056.80	89.00	1058.90	NP
NPR-MW02S	2626883.56	504555.87	S	1149.23	1146.63	45.10	1101.53	55.10	1091.53	NP	NP	SS
NPR-MW02I	2626890.12	504555.94	I	1149.17	1146.42	80.40	1066.02	90.40	1056.02	89.80	1056.62	SH
OW-01	2607927.78	499751.19	NA	1162.06	1159.48	62.00	1097.48	152.00	1007.48	152.50	1006.98	SH
OW-02	2607887.77	499740.64	NA	1161.66	1159.40	61.00	1098.40	151.00	1008.40	151.00	1008.40	SH
OW-03	2607941.06	499793.70	NA	1161.71	1159.04	61.70	1097.34	151.70	1007.34	152.00	1007.04	SH
OW-04	2607941.17	499768.09	NA	1161.81	1159.40	62.00	1097.40	152.00	1007.40	152.50	1006.90	SS
OW-05	2634938.91	495185.76	NA	1081.34	1079.63	18.50	1061.13	38.50	1041.13	39.00	1040.63	SS
OW-06	2634888.37	495207.57	NA	1079.41	1076.74	60.00	1016.74	70.00	1006.74	39.50	1037.24	SS
OW-07	2634888.21	495205.12	NA	1079.22	1076.74	18.70	1058.04	38.70	1038.04	39.50	1037.24	SS
OW-08	2634790.16	495195.78	NA	1078.56	1075.78	19.40	1056.38	39.40	1036.38	39.70	1036.08	SS
OW-09	2634941.88	495136.17	NA	1081.19	1078.56	19.00	1059.56	39.00	1039.56	40.00	1038.56	SS
OW-10	2635089.59	495208.15	NA	1079.87	1076.87	19.00	1057.87	39.00	1037.87	39.00	1037.87	SS
OW-11	2635255.85	495171.05	NA	1078.42	1075.78	23.00	1052.78	43.00	1032.78	44.00	1031.78	SS
OW-12	2636334.21	495282.45	NA	1079.79	1077.27	21.00	1056.27	41.00	1036.27	41.00	1036.27	SS
OW-13	2634931.02	495125.05	NA	1081.25	1078.56	18.50	1060.06	38.50	1040.06	39.00	1039.56	SS
OW-14	2634938.64	494991.12	NA	1080.39	1077.90	19.00	1058.90	39.00	1038.90	39.00	1038.90	SS
OW-15	2634949.63	494791.56	NA	1080.42	1078.06	21.00	1057.06	41.00	1037.06	42.00	1036.06	SS
OW-16	2633483.41	495162.80	NA	1077.59	1075.01	18.00	1057.01	38.00	1037.01	39.00	1036.01	SH
OW-17	2607999.94	499877.66	NA	1161.58	1159.10	48.00	1111.10	138.00	1021.10	150.00	1009.10	SS
OW-18	2608114.43	499884.02	NA	1162.21	1159.80	48.00	1111.80	138.00	1021.80	149.50	1010.30	SS
OW-19	2608709.98	499902.62	NA	1172.28	1169.49	49.00	1120.49	144.00	1025.49	149.00	1020.49	SS
OW-20	2607954.58	499696.42	NA	1162.79	1160.12	49.00	1111.12	139.00	1021.12	148.00	1012.12	SS
OW-21	2607936.83	499559.45	NA	1159.81	1156.90	47.00	1109.90	147.00	1009.90	154.00	1002.90	SS
OW-22	2608019.74	499355.14	NA	1161.24	1158.59	45.00	1113.59	140.00	1018.59	152.50	1006.09	SS
OW-23	2607158.35	499656.44	NA	1162.08	1158.88	50.00	1108.88	130.00	1028.88	136.50	1022.38	SH
OW-24	2629552.06	496984.50	NA	1153.07	1149.56	50.00	1099.56	95.00	1054.56	101.00	1048.56	SH

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
OW-25	2629511.42	496932.08	NA	1155.71	1152.33	50.00	1102.33	105.00	1047.33	111.00	1041.33	SH
OW-26	2629214.17	496664.05	NA	1148.64	1145.12	50.00	1095.12	95.00	1050.12	101.00	1044.12	SH
OW-27	2629582.05	496942.21	NA	1153.30	1149.80	50.00	1099.80	90.00	1059.80	98.00	1051.80	SH
OW-28	2629581.52	496898.00	NA	1153.81	1150.76	50.00	1100.76	95.00	1055.76	101.00	1049.76	SH
OW-30	2629965.06	497303.88	NA	1131.58	1128.69	50.00	1078.69	80.00	1048.69	87.00	1041.69	SS
OW-31	2624242.96	497898.99	NA	1155.78	1152.35	47.00	1105.35	97.00	1055.35	104.00	1048.35	SH
OW-32	2624139.95	497845.07	NA	1153.87	1151.31	50.00	1101.31	95.00	1056.31	104.00	1047.31	SS/SH
OW-33	2623750.57	497669.79	NA	1154.67	1152.38	50.00	1102.38	110.00	1042.38	118.50	1033.88	SS/SH
OW-34	2624320.18	497868.57	NA	1154.70	1151.61	48.00	1103.61	93.00	1058.61	102.00	1049.61	SS/SH
OW-35	2624360.77	497738.45	NA	1154.10	1150.66	50.00	1100.66	95.00	1055.66	104.00	1046.66	SS/SH
OW-36	2624413.00	497337.59	NA	1157.23	1153.96	50.00	1103.96	105.00	1048.96	113.00	1040.96	SS/SH
OW-37	2624838.27	498178.35	NA	1157.74	1154.41	50.00	1104.41	100.00	1054.41	108.75	1045.66	SS/SH
OW-38	2621733.08	496294.86	NA	1151.19	1147.66	50.00	1097.66	90.00	1057.66	98.00	1049.66	SH
OW-39	2621620.02	496212.33	NA	1151.39	1147.82	50.00	1097.82	95.00	1052.82	97.00	1050.82	SH
OW-40	2621297.36	495975.58	NA	1157.66	1154.21	50.00	1104.21	100.00	1054.21	104.00	1050.21	SH
OW-41	2621816.64	496281.90	NA	1150.22	1146.75	50.00	1096.75	90.00	1056.75	95.00	1051.75	SH
OW-42	2621899.70	496169.43	NA	1151.21	1147.71	50.00	1097.71	90.00	1057.71	95.00	1052.71	SH
OW-43	2622135.38	495845.76	NA	1156.74	1153.24	50.00	1103.24	100.00	1053.24	103.00	1050.24	SH
OW-44	2622302.63	496682.05	NA	1147.84	1144.63	50.00	1094.63	90.00	1054.63	94.00	1050.63	SS
OW-45	2619203.17	494842.21	NA	1152.47	1149.11	44.00	1105.11	104.00	1045.11	114.00	1035.11	SS
OW-46	2619059.00	494783.36	NA	1151.55	1148.16	46.00	1102.16	96.00	1052.16	105.50	1042.66	SH
OW-47	2618684.83	494630.88	NA	1153.44	1149.85	47.00	1102.85	97.00	1052.85	100.00	1049.85	SS
OW-48	2619283.37	494800.47	NA	1153.38	1150.11	48.50	1101.61	113.50	1036.61	118.00	1032.11	SS
OW-49	2619315.78	494671.87	NA	1154.09	1150.81	50.00	1100.81	110.00	1040.81	114.00	1036.81	SS
OW-50	2619465.62	494300.16	NA	1151.16	1147.70	47.00	1100.70	97.00	1050.70	104.50	1043.20	NP
OW-51	2619790.64	495096.02	NA	1149.86	1146.50	50.00	1096.50	100.00	1046.50	NP	NP	NA
OW-52	2610585.60	493033.91	NA	1107.14	1104.93	55.65	1049.28	86.00	1018.93	NA	NA	NA
OW-53	2610555.96	493019.67	NA	1107.13	1104.92	51.65	1053.27	82.00	1022.92	NA	NA	NA
OW-54	2611356.56	493520.93	NA	1115.39	1113.19	56.15	1057.04	86.50	1026.69	NA	NA	NA
OW-55	2610821.53	492991.93	NA	1107.05	1104.87	57.17	1047.70	86.50	1018.37	NA	NA	NA
OW-56	2611642.99	493196.43	NA	1112.15	1109.96	52.67	1057.29	83.00	1026.96	NA	NA	NA

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
OW-57	2611768.76	493277.87	NA	1114.84	1112.62	52.65	1059.97	83.00	1029.62	NA	NA	NA
OW-58	2611366.56	493009.96	NA	1109.00	1106.77	55.67	1051.10	86.00	1020.77	NA	NA	NA
OW-59	2611579.97	493019.21	NA	1110.50	1108.33	54.17	1054.16	84.50	1023.83	NA	NA	NA
OW-60	2627137.87	497440.67	NA	1149.15	1146.66	81.00	1065.66	101.00	1045.66	NA	NA	NA
OW-61	2627191.65	497571.53	NA	1148.81	1146.51	81.00	1065.51	101.30	1045.21	NA	NA	NA
OW-62	2627351.22	497954.27	NA	1151.40	1149.12	81.00	1068.12	101.30	1047.82	NA	NA	NA
OW-63	2627527.96	497841.89	NA	1152.90	1150.58	81.00	1069.58	101.30	1049.28	NA	NA	NA
OW-64	2627299.94	497308.27	NA	1148.12	1145.62	81.00	1064.62	101.30	1044.32	NA	NA	NA
OW-65	2627672.94	497146.26	NA	1147.36	1144.93	81.00	1063.93	101.30	1043.63	NA	NA	NA
OW-66	2622938.07	497314.20	NA	1147.09	1144.70	71.00	1073.70	86.00	1058.70	NA	NA	NA
OW-67	2622730.72	497150.23	NA	1149.64	1147.31	71.00	1076.31	86.00	1061.31	NA	NA	NA
OW-68	2622418.58	496526.17	NA	1146.89	1144.49	62.20	1082.29	77.20	1067.29	NA	NA	NA
OW-69	2623044.57	497134.81	NA	1147.02	1144.82	71.00	1073.82	86.00	1058.82	NA	NA	NA
OW-70	2623340.91	496845.85	NA	1146.14	1143.72	71.00	1072.72	86.00	1057.72	NA	NA	NA
OW-71	2623796.31	497474.10	NA	1158.23	1155.75	78.50	1077.25	108.50	1047.25	NA	NA	NA
OW-72	2620345.78	495292.98	NA	1156.05	1153.61	77.00	1076.61	97.00	1056.61	NA	NA	NA
OW-73	2620217.61	495239.66	NA	1157.61	1154.97	77.00	1077.97	97.00	1057.97	NA	NA	NA
OW-74	2619854.18	494895.06	NA	1148.38	1146.17	65.80	1080.37	85.80	1060.37	NA	NA	NA
OW-75	2620487.46	495139.42	NA	1154.51	1152.14	77.00	1075.14	97.00	1055.14	NA	NA	NA
OW-76	2620657.85	494777.17	NA	1148.68	1146.27	77.00	1069.27	97.00	1049.27	NA	NA	NA
OW-77	2621414.78	495808.38	NA	1157.82	1155.32	65.00	1090.32	85.00	1070.32	NA	NA	NA
OW-78	2609111.28	499977.47	NA	1163.94	1161.86	97.00	1064.86	137.00	1024.86	NA	NA	NA
OW-79	2608989.60	499915.27	NA	1167.29	1167.59	95.50	1072.09	135.50	1032.09	NA	NA	NA
OW-80	2608751.82	499731.59	NA	1169.30	1166.93	73.00	1093.93	113.00	1053.93	NA	NA	NA
OW-81	2609233.49	499803.10	NA	1164.13	1161.98	97.00	1064.98	137.00	1024.98	NA	NA	NA
OW-82	2609366.00	499415.33	NA	1169.05	1166.76	97.00	1069.76	137.00	1029.76	NA	NA	NA
OW-83	2609754.89	500075.01	NA	1173.20	1170.94	97.00	1073.94	137.10	1033.84	NA	NA	NA
OW-89	2632605.05	496433.60	NA	1092.56	1092.96	37.30	1055.66	47.30	1045.66	NA	NA	NP
PZ-01	2632385.13	499049.59	NA	1116.38	1114.43	47.80	1066.63	67.80	1046.63	NP	NP	NP
PZ-02	2631558.74	499022.44	NA	1130.80	1128.98	58.70	1070.28	78.70	1050.28	NP	NP	NP
PZ-03	2633505.55	501788.92	NA	1087.47	1085.73	10.10	1075.63	30.10	1055.63	NP	NP	NP

Table 2-4
Well Construction Details - Groundwater Monitoring and Observation Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Well ID	Easting (ft NAD83)	Northing (ft NAD83)	Class of Well	Top of Casing Elev. (ft NAVD88)	Ground Surface Elev. (ft NAVD88)	Top of Screen Depth	Top of Screen Elev. (ft NAVD88)	Bottom of Screen Depth	Bottom of Screen Elev. (ft NAVD88)	Top of Bedrock Depth	Bedrock Elev. (ft NAVD88)	Type of Bedrock
PZ 04	2636059.39	501690.72	NA	1086.65	1084.66	13.70	1070.96	33.70	1050.96	NP	NP	NP
PZ-05	2639988.15	502024.73	NA	1085.66	1084.19	13.90	1070.29	33.90	1050.29	NP	NP	NP
PZ-06	2636834.71	504539.69	NA	1088.42	1086.41	9.70	1076.71	29.70	1056.71	NP	NP	SS
EW-1	2634926.92	495190.58	I	1088.01	1084.37	34.00	1050.37	50.00	1034.37	42.00	1042.37	SH
EW-2	2632445.94	496479.68	I	1104.28	1101.00	46.85	1054.15	56.85	1044.15	58.00	1043.00	SS
EW-3	2629583.28	497009.50	I	1150.01	1148.00	87.04	1060.96	102.04	1045.96	102.80	1045.20	SS
EW-4	2627116.15	497384.35	I	1148.68	1146.00	82.25	1063.75	101.25	1044.75	102.80	1043.20	SH
EW-5	2624295.95	497923.55	I	1153.98	1151.00	81.10	1069.90	102.10	1048.90	103.50	1047.50	SS
EW-6	2622893.13	497269.21	I	1147.98	1144.00	71.30	1072.70	86.30	1057.70	88.50	1055.50	SS
EW-7	2621781.70	496331.02	I	1148.38	1146.00	76.21	1069.79	91.21	1054.79	91.50	1054.50	SH
EW-8	2607945.83	499756.90	I	1165.30	1162.41	72.00	1090.41	152.00	1010.41	152.00	1010.41	SS
EW-9	2620401.52	495319.73	I	1154.67	1152.00	77.23	1074.77	97.23	1054.77	103.00	1049.00	SS
EW-10	2619241.53	494857.11	I	1150.64	1148.00	78.77	1069.23	98.77	1049.23	99.50	1048.50	SS
EW-11	2609168.88	499998.83	I	1162.77	1161.00	92.05	1068.95	137.05	1023.95	139.00	1022.00	SH
EW-12	2610718.18	493104.87	I	1113.72	1110.80	60.50	1050.30	90.50	1020.30	91.50	1019.30	SH
EW-13	2611520.73	493092.65	I	NA	1109.39	53.00	1056.39	83.00	1026.39	84.00	1025.39	SH

Notes:

1. NA = Not Available or Applicable, NP = Not Penetrated
2. SS = Sandstone, SH = Shale
3. ft = Feet, bgs = Below Ground Surface, ID = Identification
4. MW = Monitoring Well, OW = Observation Well, PZ = Piezometer, EW = Extraction Well
5. Depths Cited are Below Ground Surface and All Elevations Cited Are NAVD 88, Northings and Eastings are in NAD 83
6. Class of Well - I = Intermediate, B = Shallow, and D = Bedrock

Table 2-5
Groundwater Elevations on March 29 and October 30, 2006
LPNNRD, LWS, MUD and Selected USGS Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Legal Description	Well Name	Regis-tration #	Owned by	Est. Ground Surface Elev. (ft AMSL, NAVD 88)	Mar '06 Depth To Water (ft BGS)	Mar '06 Ground-water Elev. (ft AMSL, NAVD 88)	Oct '06 Depth To Water (ft BGS)	Oct '06 Ground-water Elev. (ft AMSL, NAVD 88)
2,647,399.14	467328.45	T13N-R10E-31BB	D.Starns	G-051879	D. Starns	1060.35(5)	21.13	1039.22	18.49	1041.86
2,626,758.00	493346.43	T13N-R09E-04BAAB	Frahm	G-098491	LPNNRD	1144.73(5)	58.88	1085.85	59.51	1085.22
2,642,292.17	478302.11	T13N-R09E-24BABB	LPN 06-01	G-141403	LPNNRD	1066.68(2)	NI	NI	2.49	1064.19
2,635,721.74	504500.62	T14N-R09E-26BBAB	LPN 06-18	Not Reg.	LPNNRD	1088.45(2)	NI	NI	2.86	1085.59
2,634,208.23	514979.75	T14N-R09E-15AAAA	LPN 06-19	Not Reg.	LPNNRD	1140.81(2)	NI	NI	39.98	1100.83
2,631,355.09	520347.13	T14N-R09E-03DCCC	LPN 06-20	Not Reg.	LPNNRD	1208.77(2)	NI	NI	71.51	1137.26
2,628,536.27	525369.84	T14N-R09E-03BBBB	LPN 06-21	Not Reg.	LPNNRD	1204.53(2)	NI	NI	62.15	1142.38
2,640,590.79	488958.80	T13N-R09E-02DDDD	M90-01	G-105896	LWS	1080.35(4)	4.32	1076.03	4.69	1075.66
2,645,833.34	489117.85	T13N-R10E-07BBBB	M90-02	G-105897	LWS	1077.65(4)	5.80	1071.85	5.76	1071.89
2,640,807.93	484,163.23	T13N-R09E-14AAAA	M90-04	G-105898	LWS	1072.30(4)	4.85	1067.45	4.50	1067.80
2,645,266.37	482,393.07	T13N-R09E-13ADBA	M90-05R	G-105899	USGS	1075.33(5)	11.76	1063.57	10.46	1064.87
2,640,866.61	478,557.35	T13N-R09E-23AAAA	M90-09	G-105900	LWS	1070.35(4)	5.10	1065.25	4.54	1065.81
2,647,999.03	479,369.24	T13N-R10E-18CDBD	M90-12R	G-105901	USGS	1070.35(5)	6.99	1063.36	6.86	1063.49
2,641,258.12	472,881.56	T13N-R09E-25BBBB	M90-15	G-105902	LWS	1063.14(4)	7.19	1055.95	6.97	1056.17
2,645,344.89	473,282.19	T13N-R09E-24DDCC	M90-16R	G-105903	USGS	1066.07(5)	5.62	1060.45	5.02	1061.05
2,648,791.50	473,326.64	T13N-R10E-19CDDD	M90-17R	G-105904	USGS	1060.96(5)	11.18	1049.78	9.52	1051.44
2,651,427.57	470,805.41	T13N-R10E-30DAAB	M90-20R	G-105905	USGS	1060.35(5)	9.89	1050.46	9.58	1050.77
2,642,068.72	468,390.33	T13N-R09E-25CCCC	M90-21	G-105906	LWS	1070.01(4)	10.79	1059.22	10.44	1059.57
2,645,116.45	467,804.04	T13N-R09E-36ABAA	M90-22R	G-105907	USGS	1070.04(5)	16.73	1053.31	14.69	1055.35
2,649,222.45	468,585.23	T13N-R10E-30CDDA	M90-23R	G-105908	USGS	1060.35(5)	19.89	1040.46	14.45	1045.90
2,650,175.62	465,992.63	T13N-R10E-31ACDB	M90-24R	G-105909	USGS	1060.35(5)	15.83	1044.52	14.40	1045.95
2,652,730.86	465,392.21	T13N-R10E-32CBAB	M90-26R	G-105910	USGS	1069.36(5)	6.16	1063.20	6.46	1062.90
2,653,436.76	465,017.15	T13N-R10E-32CABC	M90-36R	G-105912	USGS	1065.24(5)	7.00	1058.24	7.29	1057.95
2,654,161.13	467,108.94	T13N-R10E-32CCDB	M90-37	G-109464P	LWS	1050.35(4)	3.35	1047.00	3.61	1046.74

Table 2-5
Groundwater Elevations on March 29 and October 30, 2006
LPNNRD, LWS, MUD and Selected USGS Wells
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (NAD 83)	Northing (NAD 83)	Legal Description	Well Name	Regis-tration #	Owned by	Est. Ground Surface Elev. (ft AMSL, NAVD 88)	Mar '06 Depth To Water (ft BGS)	Mar '06 Ground-water Elev. (ft AMSL, NAVD 88)	Oct '06 Depth To Water (ft BGS)	Oct '06 Ground-water Elev. (ft AMSL, NAVD 88)
2,645,430.50	516,093.59	T14N-R10E-07CCCC	MUD 90-10	G-102612	MUD	1099.56(1)	4.20	1097.20	4.49	1095.07
2,646,191.75	498,899.86	T14N-R10E-31BBBB	MUD 94-3	G-100702	MUD	1085.52(1)	5.87	1077.31	5.84	1079.68
2,645,711.85	509,564.70	T14N-R10E-19BBBB	MUD 94-4	G-100703	MUD	1094.81(1)	4.15	1093.27	4.42	1090.39
2,640,274.41	514,549.30	T14N-R09E-13BBBB	MUD 94-5	G-100704	MUD	1097.79(1)	4.01	1094.39	4.06	1093.73
2,639,186.28	503,954.84	T14N-R09E-26AAAA	MUD 94-6	G-100705	MUD	1085.55(1)	1.87	1070.88	2.05	1083.50
2,643,737.28	493,588.88	T13N-R09E-01ABAB	MUD 94-7	G-100706	MUD	1083.07(1)	8.01	1072.39	7.96	1075.11
2,632,145.88	495,086.41	T14N-R09E-34CDA	N.Keiser	Not Reg.	S. Keiser	1104.82(5)	25.21	1079.61	25.60	1079.22
2,642,528.87	520,668.96	T14N-R09E-12AB	N.Wann	G-098487	LPNNRD	1107.40(5)	3.02	1104.38	3.61	1103.79
2,644,078.49	514,706.21	T14N-R09E-13AACA	PV-37	G-066531	H. Kolb	1100.40(5)	5.68	1094.72	5.90	1094.50
2,642,739.04	516,678.89	T14N-R09E-12DCAB	PV-38	G-047830	C. Karloff	1100.27(5)	3.98	1096.29	3.57	1096.70
2,635,349.12	501,829.63	T14N-R09E-26CBBA	PV-39	G-053630	E. Kresek	1085.43(5)	1.80	1083.63	2.02	1083.41
2,645,299.55	502,918.87	T14N-R10E-30BCCB	PV-40	G-051424	D. Veskerna	1090.40(5)	4.85	1085.55	6.10	1084.30
2,642,174.34	514,042.61	T14N-R09E-13ABCC	PV-41	G-053428	C. Karloff	1093.78(5)	2.50	1091.28	2.91	1090.87
2,632,581.12	493,970.29	T14N-R09E-34DCC	S.Keiser	Not Reg.	S. Keiser	1112.52(5)	35.89	1076.63	36.33	1076.19
2,642,880.11	487,759.09	T13N-R09E-01CDDC	S.Wann	G-098492	LPNNRD	1076.34(5)	7.09	1069.25	7.24	1069.10
2,627,487.94	482,977.99	T13N-R09E-16BAAA	TV-17A	G-078376	V. Frahm	1138.41(5)	55.66	1082.75	56.81	1081.60

Notes

(1) Reference elevation from USGS
(2) Ground surface elevation from LPNNRD
(3) NI = Not Installed at time of measuring event
(4) Ground surface elevation from LWS
(5) Ground surface elevation estimated from USGS Digital Elevation Model

Table 2-6
Monthly Total Precipitation (inches)
MEAD_6_S, NE (Station 255362)
November 1968 to July 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1968	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.95	1.88	NM
1969	0.55	1.01	0.67	3.21	3.29	4.37	2.37	2.71	0.83	2.34	0.15	1.19	22.69
1970	0.07	0.10	0.58	2.23	2.68	4.48	1.53	4.06	4.22	4.22	1.33	0.19	25.69
1971	0.01	1.22	0.31	0.97	7.78	2.83	1.50	1.00	0.71	4.41	2.40	0.59	23.73
1972	0.04	0.18	0.76	4.85	8.56	1.95	2.43	3.06	2.65	3.07	3.51	1.34	32.40
1973	1.05	0.35	5.09	2.34	4.96	1.95	5.72	0.53	6.30	4.15	1.90	1.36	35.70
1974	0.26	0.07	0.67	2.37	4.07	1.10	0.11	5.81	1.76	3.15	0.84	0.65	20.86
1975	0.61	0.97	1.38	2.71	2.73	3.45	0.93	2.13	1.21	0.00	2.51	0.76	19.39
1976	0.21	1.31	2.14	3.02	3.00	2.46	2.43	1.66	2.93	0.35	0.00	0.04	19.55
1977	0.33	0.27	2.60	2.20	4.54	1.69	1.54	6.84	3.54	5.30	1.84	0.31	31.00
1978	0.15	0.45	0.81	6.54	3.48	3.48	3.96	1.56	5.52	0.82	1.32	0.28	28.37
1979	0.90	0.27	3.40	3.12	3.04	2.46	2.82	2.73	0.74	5.02	1.20	NM	NA
1980	0.53	0.37	0.76	1.54	1.78	3.58	1.73	6.83	0.16	2.05	0.04	0.29	19.66
1981	0.07	0.09	0.66	2.02	4.33	1.57	3.29	7.51	2.31	1.25	3.31	0.31	26.72
1982	0.80	0.13	2.80	1.79	8.80	5.43	3.22	7.58	4.56	1.79	1.39	1.50	39.79
1983	1.09	0.41	3.75	0.87	4.87	7.03	0.78	2.42	2.83	1.62	3.47	0.18	29.32
1984	0.33	0.67	1.97	5.95	4.90	6.55	1.64	0.97	1.71	5.54	0.52	3.48	34.23
1985	0.12	0.55	0.85	2.96	NM	2.29	3.65	3.01	3.35	2.35	0.86	0.19	NA
1986	0.00	0.43	2.94	5.29	2.74	3.19	4.40	5.60	7.60	4.65	0.50	0.73	38.07
1987	0.00	0.09	4.13	1.41	6.22	1.67	3.84	8.68	1.86	0.68	1.23	0.58	30.39
1988	0.46	0.09	0.05	1.43	3.28	1.02	3.57	0.72	4.80	0.07	1.60	0.48	17.57
1989	0.80	0.60	0.06	0.99	0.85	4.14	4.16	1.62	4.48	0.85	0.05	0.66	19.26
1990	0.52	0.26	3.24	0.34	4.55	4.42	7.09	0.80	0.71	1.50	0.88	0.93	25.24
1991	0.85	0.28	3.49	2.65	2.89	9.94	3.05	1.80	2.52	1.03	2.59	2.01	33.10
1992	0.76	1.08	2.57	1.43	1.69	1.82	7.18	1.78	2.24	2.07	2.06	0.51	25.19
1993	0.84	0.56	1.70	3.41	4.02	7.94	9.85	7.14	3.70	1.34	0.70	0.21	41.41
1994	0.49	0.23	0.01	1.27	1.43	9.07	4.23	1.68	3.73	1.32	2.43	0.64	26.53
1995	0.77	0.41	2.44	4.29	5.70	1.31	1.03	1.34	2.49	1.36	0.48	0.35	21.97
1996	0.51	0.06	0.90	3.22	7.30	5.50	1.46	3.01	1.99	0.67	2.32	0.38	27.32
1997	0.24	0.95	0.72	2.45	1.12	2.53	3.03	2.03	4.24	3.46	2.44	0.42	23.63
1998	0.65	1.29	2.31	2.87	5.03	7.65	3.94	6.16	0.87	2.45	2.44	0.14	35.80
1999	0.32	0.84	1.31	5.61	6.16	5.06	2.84	3.64	3.17	0.00	0.98	0.68	30.61
2000	0.07	0.79	1.60	2.28	2.29	5.63	3.83	1.17	0.80	2.13	1.78	0.75	23.12
2001	1.13	1.25	1.04	2.15	8.84	1.82	0.87	2.50	2.90	2.40	2.21	0.24	27.35
2002	0.37	0.66	0.88	3.31	3.29	0.50	2.52	8.26	1.33	4.06	0.26	0.00	25.44
2003	0.42	1.00	0.75	2.87	5.17	4.05	0.95	1.70	3.58	1.72	2.83	0.59	25.63
2004	0.98	0.64	3.32	0.99	4.77	3.09	3.00	1.94	4.03	0.86	3.15	0.31	27.08
2005	0.95	2.85	0.66	3.61	2.74	3.47	3.97	0.77	0.99	1.69	1.15	1.02	23.87
2006	1.59	0.11	3.52	4.20	NM	0.97	3.03	NA	NA	NA	NA	NA	NA
Avg	**0.52**	**0.60**	**1.75**	**2.75**	**4.24**	**3.72**	**3.09**	**3.31**	**2.79**	**2.20**	**1.56**	**0.70**	**27.36**

NM = missing, NA= Not Applicable
Generated 09/12/2006

Table 2-7
Monthly Total Precipitation (inches)
ASHLAND_2, NE (Station 250375)
January 1893 to July 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1893	0.05	NM	0.85	NM	4.71	7.27	3.92	6.43	2.35	0.05	NM	0.65	NA
1894	0.26	0.72	0.62	2.01	0.92	5.03	NM	0.12	0.52	2.52	0.25	NM	NA
1895	0.14	0.38	0.48	2.31	2.62	NM	2.00	6.36	0.97	0.00	0.82	0.26	NA
1896	0.21	0.30	0.98	2.97	10.57	1.80	5.56	2.85	5.45	3.28	1.88	0.35	36.20
1897	0.32	0.43	1.23	7.29	2.12	2.31	1.66	1.44	NM	3.39	0.25	NM	NA
1898	0.31	NM	1.51	NM	NM	2.21	1.18	2.95	2.90	1.53	0.44	0.16	NA
1899	0.03	10.65	0.45	NM	4.34	10.65	3.54	NM	0.58	2.47	0.96	1.74	NA
1900	0.10	0.62	0.44	NM	2.27	3.15	6.52	6.07	2.76	4.27	0.00	0.68	NA
1901	0.13	0.42	NM	NM	NM	3.20	5.63	1.12	5.29	2.16	0.71	0.28	NA
1902	1.31	0.02	0.40	0.94	3.22	8.72	13.86	5.41	2.70	2.67	1.49	1.79	42.53
1903	0.00	1.16	0.50	3.88	NM	2.30	5.92	5.77	2.84	NM	0.50	0.00	NA
1904	0.50	0.05	0.74	4.46	5.96	2.74	3.40	3.71	2.36	1.44	0.27	0.30	25.93
1905	0.95	0.70	0.56	5.04	3.77	2.54	2.73	5.54	5.62	1.75	2.52	0.14	31.86
1906	0.48	1.05	2.00	3.74	1.90	5.93	4.68	3.09	5.74	2.05	0.40	1.94	33.00
1907	0.50	1.46	0.39	1.35	5.13	6.96	7.11	2.73	3.03	1.42	0.79	0.21	31.08
1908	0.35	2.00	0.69	1.13	5.20	11.86	6.80	3.59	0.31	2.61	0.63	0.16	35.33
1909	0.67	0.86	0.35	1.54	3.76	4.99	3.33	0.96	5.09	0.98	7.66	2.53	32.72
1910	0.87	0.23	0.09	0.11	2.74	1.42	0.67	5.55	2.69	0.88	0.02	0.39	15.66
1911	0.21	2.30	0.44	2.04	4.68	0.54	1.90	1.76	1.84	0.93	0.16	2.18	18.98
1912	0.17	1.14	2.07	1.46	0.40	3.65	2.00	3.43	5.31	3.04	0.68	0.09	23.44
1913	0.72	0.96	1.93	2.62	8.06	2.31	3.45	0.25	3.67	0.71	1.65	3.06	29.39
1914	0.30	0.54	2.21	2.64	4.35	7.72	2.02	1.00	3.72	2.58	0.05	0.88	28.01
1915	1.72	2.45	1.68	1.15	5.08	4.30	7.41	4.01	3.11	1.06	1.49	0.68	34.14
1916	1.26	0.40	0.64	1.13	3.25	3.15	1.66	4.45	0.76	0.98	0.86	0.37	18.91
1917	0.59	0.04	1.42	4.31	3.81	7.53	0.71	3.26	0.92	0.41	0.13	0.76	23.89
1918	0.62	0.86	0.23	0.66	3.39	1.94	3.83	1.06	1.09	4.49	2.61	0.77	21.55
1919	0.11	1.90	1.05	2.24	2.00	6.49	1.47	3.15	5.40	1.78	2.94	0.72	29.25
1920	0.24	0.71	0.59	3.00	3.11	3.21	3.64	2.74	0.78	3.56	1.43	1.00	24.01
1921	0.33	0.42	0.64	2.09	4.40	3.43	3.43	2.88	4.21	1.04	0.14	0.06	23.07
1922	0.80	0.32	1.38	1.81	2.25	2.44	4.48	1.73	1.95	1.23	2.81	0.08	21.28
1923	0.56	0.02	1.22	2.83	3.96	5.04	2.93	4.07	4.67	0.53	0.01	0.50	26.34
1924	0.38	0.96	1.20	0.33	1.84	5.48	5.78	1.17	2.18	0.79	0.31	1.36	21.78
1925	0.67	0.83	0.57	1.73	1.15	4.61	1.85	5.69	2.62	1.71	0.04	0.78	22.25
1926	0.82	0.60	0.85	0.46	2.31	2.74	2.05	5.17	8.34	1.20	2.11	1.09	27.74
1927	0.10	1.05	1.18	5.15	1.41	2.05	2.50	2.63	4.06	0.52	0.00	0.43	21.08
1928	0.05	0.81	0.48	1.25	2.09	5.46	4.51	4.76	3.29	2.44	3.56	0.08	28.78
1929	0.80	1.66	0.17	3.00	2.33	2.84	3.87	1.70	1.80	4.01	1.44	0.12	23.74
1930	0.84	0.35	0.47	2.51	2.57	3.32	1.96	5.50	1.32	0.47	1.78	0.23	21.32
1931	0.20	0.05	0.75	1.72	5.13	5.62	2.89	2.80	4.85	2.37	4.67	2.04	33.09
1932	2.93	0.64	0.59	1.11	3.06	6.26	1.67	7.29	2.14	1.61	0.05	0.52	27.87
1933	0.10	0.19	1.52	1.28	1.26	1.32	4.12	2.05	6.63	0.14	0.88	1.50	20.99
1934	0.98	0.43	0.62	0.00	0.38	2.34	0.47	1.46	2.43	1.71	2.84	0.77	14.43

Table 2-7
Monthly Total Precipitation (inches)
ASHLAND_2, NE (Station 250375)
January 1893 to July 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1935	0.08	NM	NM	1.64	4.69	5.57	3.44	2.03	3.56	2.70	1.88	0.40	NA
1936	2.87	0.89	0.10	0.90	1.69	NM	0.05	1.74	5.48	0.23	0.15	0.73	NA
1937	0.79	0.09	1.95	NM	3.93	3.51	4.46	4.73	1.17	2.21	0.35	0.09	NA
1938	0.18	0.77	1.32	2.94	5.20	3.86	4.52	4.65	3.58	1.84	1.13	0.15	30.14
1939	0.28	1.07	0.60	1.08	1.71	4.61	NM	2.08	0.61	2.61	0.00	2.12	NA
1940	0.94	1.12	1.16	1.95	0.78	5.43	0.93	5.21	1.27	1.99	1.67	1.25	23.70
1941	1.11	0.78	0.40	4.13	2.18	5.01	1.22	2.11	NM	1.25	1.28	2.49	NA
1942	0.27	0.88	2.72	0.39	3.56	3.20	1.94	2.60	4.81	0.95	0.18	1.08	22.58
1943	NM	0.63	0.89	1.69	3.66	6.37	5.36	2.61	1.83	1.25	0.55	0.00	NA
1944	0.75	1.08	1.63	9.76	4.58	5.45	NM	NM	NM	1.39	1.97	NM	NA
1945	0.52	2.52	1.83	4.73	6.55	6.56	6.18	1.63	NM	NM	NM	NM	NA
1946	NM	0.03	2.77	0.78	4.97	9.76	NM	NM	NM	3.81	2.13	0.06	NA
1947	NM	0.12	1.00	6.35	3.31	11.71	2.00	0.91	1.30	1.61	1.04	1.46	NA
1948	0.38	1.88	1.93	2.07	2.08	2.58	9.41	5.85	3.82	1.77	2.16	0.83	34.76
1949	2.94	0.89	1.13	0.96	4.70	7.13	2.65	2.56	3.51	1.68	0.03	0.21	28.39
1950	0.73	1.46	0.56	1.18	3.54	1.00	5.20	4.06	0.60	2.64	0.50	0.13	21.60
1951	0.58	2.03	3.21	5.19	4.90	7.92	3.56	7.24	2.06	1.97	0.28	0.95	39.89
1952	0.48	0.83	2.83	3.75	3.48	5.08	1.65	6.48	0.81	0.00	3.95	1.16	30.50
1953	0.63	1.08	2.14	3.63	2.12	3.43	3.05	1.92	0.70	0.32	2.12	1.30	22.44
1954	0.11	2.38	0.80	2.24	4.84	NM	0.45	9.18	1.47	3.04	0.00	NM	NA
1955	1.20	0.62	0.62	2.28	1.02	4.72	0.63	1.02	4.69	0.51	0.11	0.19	17.61
1956	NM	NM	0.12	1.22	1.12	4.36	2.93	3.10	2.93	1.32	1.36	0.11	NA
1957	0.31	0.15	3.02	1.85	3.24	6.21	3.86	5.71	1.26	3.56	2.27	0.52	31.96
1958	0.96	1.51	1.05	2.96	1.60	0.99	11.20	5.29	6.06	0.10	0.83	0.00	32.55
1959	0.45	0.58	3.79	2.68	10.70	2.10	5.64	5.24	3.06	2.31	0.34	0.60	37.49
1960	1.57	1.30	0.85	2.58	3.93	5.73	4.23	6.55	4.15	0.86	0.27	0.24	32.26
1961	0.23	0.55	2.89	2.00	3.11	1.57	2.88	4.41	5.04	2.50	1.71	0.71	27.60
1962	0.38	1.51	0.97	0.85	4.72	3.18	7.60	3.93	2.95	2.53	0.74	0.53	29.89
1963	0.65	0.28	2.20	1.71	2.71	6.73	2.14	3.18	5.19	0.39	0.28	0.38	25.84
1964	0.20	0.30	1.29	5.54	4.16	10.38	5.01	3.85	4.37	0.36	1.06	0.65	37.17
1965	0.29	2.05	2.95	3.61	9.18	8.11	6.02	2.49	11.63	0.50	1.07	1.08	48.98
1966	0.65	0.49	0.70	1.08	2.66	NM	4.96	3.46	2.04	0.59	0.24	0.53	NA
1967	0.42	0.13	1.36	2.19	2.62	13.29	1.72	1.32	3.34	3.23	NM	0.77	NA
1968	NM	NM	0.31	3.10	3.89	2.34	3.63	5.51	5.33	4.01	0.79	1.44	NA
1969	0.71	0.94	0.84	4.74	4.60	3.57	2.78	2.26	1.30	2.00	0.22	1.46	25.42
1970	0.13	0.10	0.68	2.39	2.39	2.66	2.56	2.85	5.59	3.42	1.14	0.17	24.08
1971	0.64	2.57	0.46	0.46	9.79	2.56	1.22	2.75	0.75	4.61	2.91	0.96	29.68
1972	0.03	0.23	0.91	5.45	7.68	2.01	2.25	3.51	2.70	3.41	3.59	1.40	33.17
1973	1.86	0.65	5.66	2.74	5.76	1.68	5.24	0.28	7.78	3.62	2.10	1.75	39.12
1974	0.55	0.28	0.80	2.52	3.83	1.34	0.27	5.42	0.75	2.24	1.25	0.54	19.79
1975	1.18	1.01	1.62	2.60	2.68	4.34	1.05	5.36	1.53	0.08	3.40	0.52	25.37
1976	0.40	1.36	2.46	4.08	3.71	1.02	2.32	0.96	3.09	0.71	0.00	0.07	20.18
1977	0.51	0.22	2.18	2.34	5.77	2.13	1.84	10.41	1.80	3.16	1.72	0.24	32.32
1978	0.29	0.94	1.15	7.25	4.43	2.18	6.62	2.10	4.17	1.18	1.41	0.30	32.02
1979	1.31	0.37	3.53	2.68	1.93	3.54	3.14	2.33	1.01	4.63	1.27	0.37	26.11
1980	NM	0.42	1.46	1.78	0.97	5.70	2.07	8.13	0.39	2.11	0.07	0.81	NA
1981	0.00	0.45	0.96	1.99	3.56	2.13	2.63	8.59	1.35	2.38	2.77	1.39	28.20
1982	0.79	0.23	2.34	1.83	9.68	3.11	3.30	7.60	3.61	1.82	1.96	1.90	38.17
1983	0.94	0.69	3.96	1.42	3.73	8.22	0.28	2.89	2.79	1.78	2.58	0.63	29.91
1984	0.47	0.78	2.74	5.43	4.87	6.62	1.69	1.01	1.22	4.34	1.12	4.03	34.32
1985	0.29	0.68	1.60	2.63	6.08	1.89	4.37	3.28	3.98	1.91	0.57	0.36	27.64

Table 2-7
Monthly Total Precipitation (inches)
ASHLAND_2, NE (Station 250375)
January 1893 to July 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1986	0.00	0.76	2.75	6.17	3.11	3.54	4.95	6.96	7.13	5.64	0.83	1.09	42.93
1987	0.03	0.19	5.05	1.86	7.96	3.15	2.08	11.86	1.45	0.75	1.88	0.72	36.98
1988	0.49	0.19	0.02	2.08	3.43	2.06	3.04	1.60	4.03	0.10	1.82	0.73	19.59
1989	0.98	0.85	0.16	1.07	0.56	5.08	2.78	2.47	5.11	1.47	0.00	0.41	20.94
1990	0.58	0.24	2.54	0.52	4.79	3.41	7.10	1.98	0.61	1.65	1.28	1.17	25.87
1991	1.35	0.25	2.65	3.98	3.78	4.84	3.20	2.61	1.13	1.61	3.01	1.70	30.11
1992	1.52	0.81	2.68	2.98	1.81	1.62	7.66	2.58	2.93	2.39	2.17	1.20	30.35
1993	1.66	0.94	2.36	2.93	6.21	6.54	15.81	8.81	3.21	1.82	1.01	0.50	51.80
1994	0.58	0.79	0.00	1.23	2.10	8.66	4.68	1.07	2.90	1.63	1.90	1.41	26.95
1995	1.16	0.52	2.90	4.27	7.70	1.73	1.16	1.08	2.80	1.13	1.00	0.35	25.80
1996	1.21	0.05	0.99	3.65	7.85	3.56	2.97	3.08	2.70	1.04	2.48	0.53	30.11
1997	0.48	0.85	0.55	2.91	1.67	3.84	3.82	1.90	2.43	5.32	2.54	0.55	26.86
1998	0.89	1.09	3.40	2.83	7.91	6.76	2.78	4.83	0.75	2.71	2.38	0.30	36.63
1999	0.55	1.25	1.40	6.08	7.40	3.72	4.91	4.16	2.45	0.00	0.90	0.70	33.52
2000	0.10	1.39	1.33	1.36	2.24	5.09	3.61	1.12	0.88	2.53	2.83	1.25	23.73
2001	1.32	2.58	0.88	1.72	10.07	1.25	0.60	1.62	2.88	2.85	1.86	0.50	28.13
2002	0.61	0.68	1.20	2.44	4.60	1.43	0.78	9.06	1.14	3.66	0.33	0.00	25.93
2003	0.51	1.45	0.83	2.59	3.56	3.42	0.98	1.46	2.57	1.47	2.68	1.09	22.61
2004	1.70	0.94	3.74	1.20	3.45	3.35	3.72	1.55	4.30	0.43	2.71	0.28	27.37
2005	1.28	2.65	0.65	4.46	2.21	3.51	6.15	0.55	0.35	1.79	1.14	0.86	25.60
2006	1.05	0.17	1.92	3.93	NM	0.88	1.77	NA	NA	NA	NA	NA	NA
Avg	**0.66**	**0.92**	**1.41**	**2.63**	**3.93**	**4.33**	**3.59**	**3.64**	**2.98**	**1.91**	**1.34**	**0.79**	**28.43**

NM = missing, NA= Not Applicable
Generated 09/12/2006

Table 2-8
Metropolitan Utilities District Platte West Well Field
Maximum Permitted Average Annual Pumping Rates
Former Nebraska Ordnance Plant, Mead, Nebraska

Regis-tration Code	NDNR Well ID	MUD Well ID	Regis-tration Pumping Rate (gpm)	Total Depth (ft bgs)	Static Water Level (ft bgs)	Pumping Water Level (ft bgs)	Comp-letion Year	Depth Screen Top (ft bgs)	Depth Screen Bottom (ft bgs)	Max Permitted Annual Avg. Pumping Rate (gpm) (51.4MGD total)
G-075360	83847	PW91-30		89	7	10	1991	50.5	89	3,058
G-075361	83848	PW91-03		97	4	6	1992	50.5	97	3,058
G-100692	118435	PW94-02	2500	92	2	10	1995	50.5	92	789
G-100693	118436	PW94-31		92	3	11	1994	50.5	91	1,282
G-100694	118437	PW94-32		91	3	11	1995	50.5	90	0
G-100695	118438	PW94-33		89	3	11	1995	50.5	89	789
G-100696	118439	PW94-34		90	3	11	1995	50.5	90	1,512
G-100697	118440	PW94-35	2500	94	3	13	1995	50.5	93	1,233
G-100698	118442	PW94-36	2500	95	3	13	1995	50.5	92	2,301
G-100699	118443	PW94-37	2500	93	2	12	1995	50.5	93	2,137
G-130656	159825	PW04-39		87	3.7	13.5	2004	50.6	87	345
G-130655	159826	PW04-38		90	3.3	14.4	2004	50.6	90	1,381
G-130659	159827	PW04-45		85	6.3	17	2004	50.6	85	1,036
G-130657	159828	PW04-40		87	5.4	17.6	2004	50.6	87	1,726
G-130658	159829	PW04-41		88	5.8	19.5	2004	50.6	88	0
G-130663	159830	PW04-42		92	4	18.7	2004	50.6	92	953
G-130696	159831	PW04-43		91	5.2	17	2004	50.6	91	345
G-130697	159834	PW04-44		90	4.3	16.4	2004	50.6	89	493
G-130660	159835	PW04-46		86	5	15.3	2004	50.6	86	756
G-130661	159836	PW04-47		90	4	17.8	2004	50.6	88	0
G-130662	159837	PW04-48		94	5.6	21.5	2004	50.6	83	1,192
G-130698	159838	PW04-49		90	3.3	15.5	2004	50.6	90	608
G-130822	159839	PW04-50		87	5	18.1	2004	50.6	87	0
G-130821	159840	PW04-51		91	5.9	29.1	2004	50.6	91	238
G-130752	159841	PW04-52		87	5.8	15.8	2004	50.6	87	263
G-130753	159842	PW04-53		88	5.5	23	2004	50.6	87	715
G-130654	159843	PW04-54		90	5.6	17	2004	50.6	90	715
G-130653	159844	PW04-55		90	7.8	23	2004	50.6	90	0
G-130839	163269	PW04-04		88	4.8	15.3	2004	51.0	88	0
G-130840	163270	PW04-05		90	5.3	20	2004	50.6	90	856
G-130841	163271	PW04-06		91	3.8	15.1	2004	50.6	91	0
G-130842	163272	PW04-07		91	4	12	2004	50.6	91	285
G-130843	163273	PW04-08		93	4.2	15.8	2004	50.6	93	1,427
G-130844	163274	PW04-09		94	5.1	15.9	2004	50.6	85	856
G-130928	163275	PW04-10		91	4	12.8	2004	50.6	91	0
G-130929	163276	PW04-11		91	3.9	14.3	2004	50.6	80	0
G-130845	163277	PW04-12		94	40		2004	50.6	94	329
G-130846	163278	PW04-13		90	6.8	18.2	2004	50.6	90	856
G-130930	163279	PW04-14		95	3.9	15.9	2004	50.6	67	658
G-130898	163369	PW04-16		92	2.9	15	2004	50.6	92	856
G-130899	163371	PW04-17		89	4	17.7	2004	50.6	80	1,315
G-130968	163522	PW04-15		93	7	17	2004	50.6	71	1,315
SUM										**35,678**

Table 2-9
Lincoln Water System Ashland Well Field Estimated 2006 Pumping Rates
Former Nebraska Ordnance Plant, Mead, Nebraska

Registration Code	NRD Well ID	LWS Well ID	Registration Pumping Rate (gpm)	Total Depth (ft bgs)	Static Water Level (ft bgs)	Pumping Water Level (ft bgs)	Comp-letion Year	Depth Screen Top (ft bgs)	Depth Screen Bottom (ft bgs)	2006 Est. Summer Pumping Rate (gpm) (62MGD total)	2006 Est. Non-Summer Pumping Rate (gpm) (36MGD total)	2006 Est. Annual Pumping Rate (gpm) (40.3MGD total)
A-010367A	2907	56-8	1,400	80	15	34	1956	38	80	674	391	438
A-010367B	2908	56-9	1,400	88	17	46	1956	50	83	674	391	438
A-010367C	2909	56-5	1,400	71	15	24	1957	28	63	674	391	438
A-010367CC	2910	54-3	1,400	91	23	48	1954	52	84	674	391	438
A-010367D	2911	56-7	1,400	70	15	48	1956	52	70	674	391	438
A-010367DD	2912	54-5	1,400	89	23	47	1954	51	84	674	391	438
A-010367E	121138	325A	1,960	61	17	33	2000	31	61	943	548	613
A-010367EE	2914	54-7	1,400	76	23	41	1954	45	54	674	391	438
A-010367H	2917	32-4-2	1,000	52	14	27	1957	31	52	481	279	313
A-010367HH	2918	54-9	1,400	86	17	48	1954	52	82	674	391	438
A-010367I	2919	32-4A-2	1,000	51	13	25	1957	29	51	481	279	313
A-010367JJ	2921	54-6	1,400	84	17	36	1954	40	83	674	391	438
A-010367K	2922	32-3-2	1,400	62	16	40	1954	44	62	674	391	438
A-010367KK	2923	54-8	1,800	87	15	40	1955	44	83	866	503	563
A-010367L	2924	32-2-2	1,400	89	24	42	1950	46	88	674	391	438
A-010367MM	2926	54-10	2,500	93	16	41	1954	45	89	1,203	699	782
A-010367Q	105710	32-1A	2,000	86	12	27	1996	31	86	962	559	626
A-010367QQ	2931	56-1	1,400	85	15	37	1956	41	78	674	391	438
A-010367R	2932	49-7	1,400	90	30	61	1949	65	82	674	391	438
A-010367S	121139	49-8	1,965	84	21	40	2000	44	60	946	549	615
A-010367T	2934	49-6	1,400	92	31	48	1949	52	64	674	391	438
A-010367X	2935	49-9	1,400	91	31	52	1949	56	86	674	391	438
A-010367Y	2936	54-1	1,400	92	24	43	1954	47	89	674	391	438
G-070300	78466	66 - 1	1,400	69	32	48	1966	52	64	674	391	438
G-070303	78469	76 - 1	3,000	96	27	36	1976	40	89	1,444	838	938
G-070304	78470	66 - 4	1,400	89	29	48	1966	52	84	674	391	438
G-070305	78471	76 - 2	3,000	93	29	42	1977	46	84	1,444	838	938
G-070306	78472	66 - 5	1,400	90	30	58	1966	62	66	674	391	438
G-070307	78473	66 - 6	1,400	89	31	54	1966	58	66	674	391	438
G-070308	78474	76 - 3	3,000	93	25	40	1977	44	82	1,444	838	938
G-070309	78475	76 - 4	3,000	93	18	30	1977	34	83	1,444	838	938
G-070310	168254	68-1A	2,250	86	14	33	2006	52	77	1,083	629	704
G-070311	78477	76 - 5	3,000	94	19	39	1977	43	89	1,444	838	938
G-070312	78478	76 - 6	1,800	99	21	41	1977	45	89	866	503	563
G-070412	78574	NA	1,400	90	17	39	1954	43	80	674	391	438
G-072911	81099	86-1	2,200	95	12	31	1987	35	86	1,059	615	688
G-072912	81100	86-2	2,200	96	11	26	1987	30	84	1,059	615	688
G-076884	85451	NA	12,200	87	11	32	1992	36	86	5,871	3,409	3,816
G-077983	86646	NA	12,200	95	10	28	1993	32	63	5,871	3,409	3,816
SUM			**89,475**							**43,056**	**25,000**	**27,986**

Table 2-10
Other Municipal Water Supply Wells
Estimated Pumping Rates
Former Nebraska Ordnance Plant, Mead, Nebraska

Registration Code	NRD Well ID	Well ID	Regis-tration Pumping Rate (gpm)	Total Depth (ft bgs)	Static Water Level (ft bgs)	Pumping Water Level (ft bgs)	Comp-letion Year	Depth Screen Top (ft bgs)	Depth Screen Bottom (ft bgs)	Annual Avg. Est. Pumping Rate (gpm) (population based)
A-010589B	3098	Ashland(82-1)	300	105	26	41	1982	88	77	58
A-010589C	3099	Ashland(#4)	750	122	24	20	1963	47	77	58
G-070339	78501	Ashland(#5)	650	120			1978	79	109	58
G-140851	177281	Ashland(2006-1)	0	127	58	80.7	2006	94	124	0
G-070696	78857	Ithaca(1)	200	127	50	71	1988	70	100	5.8
G-070697	78858	Ithaca(2)	100	116	55	72	1988	68	98	5.8
G-065343	73325	Mead(1)	150	85			1977	55	85	11
G-065345	73327	Mead(2)	100	80	30		1969	50	80	11
G-065346	73328	Mead(3)	300	130	36	41	1958	100	130	11
G-075799	84291	Mead(4)	500	131	29	33	1992	101	131	11
G-040474	47715	Memphis(73-1)	200	100	30	65	1973	55	85	3.8
G-126122	156994	Memphis(94-1)	300	184	43	63	1994	150	90	3.8
G-033485	40511	Yutan(1)	300	232	93	136	1969	103	133	28
G-050012	57512	Yutan(2)	400	220	30	88	1976	54	84	28
G-072670	80858	Yutan(3)	600	245	15	65	1990	70	100	28

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,635,179	457,916	61191	G-053628	120	-	900	12	9	3	DO	80	164	-	164	41
2,626,206	461,153	81108	G-072920	80	-	400	12	9	4	BB	90	110	-	110	27
2,602,215	487,428	170110	G-135474	280	-	550	13	8	3	DC	180	383	-	383	96
2,599,802	485,900	82860	G-074511	135	-	600	13	8	10	BO	165	185	-	185	46
2,599,803	484,548	81051	G-072863	140	-	700	13	8	10	CB	205	192	-	192	48
2,601,676	484,633	81052	G-072864	70	-	400	13	8	10	DB	185	96	-	96	24
2,605,005	486,102	65312	G-057633	80	-	800	13	8	11	BO	170	110	-	110	27
2,608,143	483,511	71102	G-063202	133	-	480	13	8	11	O	155	182	-	182	46
2,610,561	479,696	124740	G-139933	155	-	800	13	8	13	BD	198	212	-	212	53
2,613,899	479,133	65173	G-057497	160	-	700	13	8	13	DA	120	219	-	219	55
2,597,521	479,180	100924	G-088853	130	-	700	13	8	16	DA	246	178	-	178	45
2,608,352	470,332	111977	G-096372	250	-	700	13	8	26	AO	140	342	-	342	86
2,643,731	492,946	102747	G-093865	120	-	750	13	9	1	AB	98	164	-	164	41
2,641,811	490,245	5723	G-002172	160	-	500	13	9	1	CO	88	219	-	219	55
2,636,529	489,925	166038	G-134121	150	-	800	13	9	2	CC	145	205	-	205	51
2,633,146	493,215	59908	G-052354	160	-	900	13	9	3	AB	113	219	-	219	55
2,633,231	490,577	61222	G-053658	100	-	900	13	9	3	DB	142	137	-	137	34
2,628,551	492,400	87038	G-078375	275	-	750	13	9	4	AB	125	377	-	377	94
2,625,896	492,252	59327	G-051786	160	-	850	13	9	4	BO	122	219	-	219	55
2,623,868	492,824	59223	G-051685	80	-	800	13	9	5	AA	102	110	-	110	27
2,623,023	489,507	86633	G-077970	227	-	800	13	9	5	DB	230	311	-	311	78
2,620,667	489,385	81881	G-073545	65	-	900	13	9	5	O	220	89	-	89	22
2,619,232	491,940	99532	G-087637	120	-	600	13	9	6	AA	124	164	-	164	41
2,618,041	489,262	171258	G-136318	140	-	950	13	9	6	DO	118	192	-	192	48
2,622,683	483,848	42290	G-035213	135	-	800	13	9	8	DC	110	185	-	185	46
2,628,706	487,137	80939	G-072751	340	-	900	13	9	9	AB	200	466	-	466	116
2,626,046	484,318	100360	G-088331	135	-	800	13	9	9	CC	225	185	-	185	46
2,628,140	485,091	24278	G-018285	100	-	700	13	9	9	DB	203	137	-	137	34
2,633,275	487,156	167378	G-134176	70	-	800	13	9	10	AC	145	96	-	96	24
2,630,732	486,524	65174	G-057498	160	-	900	13	9	10	BC	135	219	-	219	55
2,633,419	485,276	61375	G-053801	160	-	600	13	9	10	DB	95	219	-	219	55
2,637,438	484,094	7820	G-004004	50	-	1000	13	9	11	CD	50	68	-	68	17
2,639,386	484,836	55242	G-047789	80	-	800	13	9	11	DO	82	110	-	110	27
2,642,547	488,271	7643	G-003848	80	-	1000	13	9	12	BA	59	110	-	110	27
2,645,742	483,954	141459	G-116504	90	-	800	13	9	12	DD	65	123	-	123	31
2,644,712	483,745	37552	G-030654	220	-	1200	13	9	12	O	70	301	-	301	75

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,645,404	483,101	57677	G-050176	160	-	900	13	9	13	AA	72	219	-	219	55
2,641,514	481,602	57678	G-050177	160	-	1000	13	9	13	BC	77	219	-	219	55
2,642,895	480,344	54796	G-047357	137	-	1000	13	9	13	CA	85	188	-	188	47
2,644,164	481,003	130750	G-109619	26	-	670	13	9	13	DB	54	36	-	36	9
2,644,277	479,087	8001	G-004168	35	-	700	13	9	13	DC	83	48	-	48	12
2,631,579	481,917	59402	G-051860	160	-	850	13	9	15	BO	134	219	-	219	55
2,629,634	481,169	60636	G-053077	160	-	850	13	9	16	AD	113	219	-	219	55
2,627,455	483,026	87039	G-078376	80	-	400	13	9	16	BA	200	110	-	110	27
2,626,998	481,045	66478	G-058774	80	-	360	13	9	16	BD	135	110	-	110	27
2,629,665	478,469	40499	G-033472	120	-	500	13	9	16	DD	105	164	-	164	41
2,624,230	482,238	59328	G-051787	160	-	650	13	9	17	AA	115	219	-	219	55
2,618,921	481,253	171088	G-136149	89	-	600	13	9	18	AD	119	122	-	122	30
2,615,223	477,870	54398	G-046970	160	-	750	13	9	18	CC	78	219	-	219	55
2,617,221	478,589	37578	G-030678	180	-	750	13	9	18	DC	90	246	-	246	62
2,618,596	476,047	169011	G-048035	120	-	600	13	9	19	AO	93	164	-	164	41
2,616,593	476,599	67438	G-059681	75	-	1100	13	9	19	BA	117	103	-	103	26
2,619,338	474,071	66950	G-059231	100	-	300	13	9	19	DA	90	137	-	137	34
2,620,524	476,762	66524	G-058820	175	-	900	13	9	20	BB	99	240	-	240	60
2,621,960	474,183	70393	G-062530A	160	-	400	13	9	20	CA	72	219	-	219	55
2,621,351	473,531	96480	G-085344	137	-	500	13	9	20	CA	103	188	-	188	47
2,626,510	473,638	171089	G-136150	260	-	800	13	9	21	CC	110	356	-	356	89
2,633,844	476,036	65313	G-057634	320	-	1000	13	9	22	AC	154	438	-	438	110
2,631,146	477,249	71989	G-064065	150	-	700	13	9	22	BB	118	205	-	205	51
2,637,394	474,771	154861	G-127035	100	-	400	13	9	23	CA	125	137	-	137	34
2,644,379	476,422	8002	G-004169	35	-	700	13	9	24	AC	91	48	-	48	12
2,643,489	470,451	21909	G-016190	200	-	700	13	9	25	CA	49	274	-	274	68
2,644,878	468,099	154862	G-127071	150	-	700	13	9	25	DC	80	205	-	205	51
2,646,418	469,230	136179	G-113882	85	-	800	13	9	25	DD	67	116	-	116	29
2,623,017	465,646	146174	G-119684	100	-	700	13	9	32	AB	155	137	-	137	34
2,621,011	466,220	67299	G-059551	80	-	450	13	9	32	BB	155	110	-	110	27
2,629,718	465,845	159089	G-127545	65	-	500	13	9	33	AC	130	89	-	89	22
2,630,445	462,658	67297	G-059549	80	-	500	13	9	33	DD	103	110	-	110	27
2,625,854	463,119	67298	G-059550	0	-	400	13	9	33	O	117	0	-	0	0
2,625,737	464,448	112723	G-096371	160	-	700	13	9	33	O	170	219	-	219	55
2,638,290	462,981	61192	G-053629	80	-	700	13	9	35	CD	96	110	-	110	27
2,646,092	467,270	74635	G-066614	108	-	600	13	9	36	AA	83	148	-	148	37

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,665,980	494,614	63906	G-056279	160	-	900	13	10	3	AA	177	219	-	219	55
2,663,380	494,452	42554	G-035461	85	-	1000	13	10	3	BA	56	116	-	116	29
2,662,287	491,290	140664	G-116108	90	-	700	13	10	3	CB	50	123	-	123	31
2,664,820	490,598	64487	G-056838	160	-	700	13	10	3	DC	154	219	-	219	55
2,666,723	491,277	103896	G-096225	10	-	45	13	10	3	DD	287	14	-	14	3
2,658,832	491,034	90565	G-081652	135	-	850	13	10	4	CA	51	185	-	185	46
2,660,875	490,422	63905	G-056278	40	-	700	13	10	4	DD	53	55	-	55	14
2,647,861	487,194	75689	G-067620	220	-	1000	13	10	7	BD	78	301	-	301	75
2,647,294	485,182	113192	G-110360	100	-	700	13	10	7	CO	75	137	-	137	34
2,655,831	484,957	68690	G-060900	65	-	700	13	10	8	DD	60	89	-	89	22
2,658,967	488,378	91816	G-082391	157	-	800	13	10	9	-	52	215	-	215	54
2,660,838	489,061	90566	G-081653	78	-	1035	13	10	9	AA	50	107	-	107	27
2,659,608	489,061	77664	G-069511	80	-	700	13	10	9	AB	65	110	-	110	27
2,656,971	488,967	64150	G-056515	130	-	900	13	10	9	BB	26	178	-	178	45
2,657,086	488,362	130829	G-109425	65	-	150	13	10	9	BB	50	89	-	89	22
2,665,577	488,332	25201	G-019114	153	-	1000	13	10	10	-	172	209	-	209	52
2,662,677	489,787	38884	G-031913	160	-	1100	13	10	10	BB	57	219	-	219	55
2,662,357	486,519	4084	G-000745	80	-	500	13	10	10	CB	80	110	-	110	27
2,661,844	484,444	25098	G-019020	40	-	1000	13	10	15	BB	51	55	-	55	14
2,663,120	483,262	101558	G-089306	65	-	850	13	10	15	BB	61	89	-	89	22
2,660,659	480,472	48849	G-041584	154	-	1000	13	10	16	DO	84	211	-	211	53
2,655,527	480,289	63526	G-055912	135	-	800	13	10	17	-	49	185	-	185	46
2,655,259	482,919	60342	G-052785	160	-	800	13	10	17	AO	52	219	-	219	55
2,651,936	483,456	60343	G-052786	80	-	750	13	10	17	BB	52	110	-	110	27
2,653,362	480,869	69538	G-061703	105	-	600	13	10	17	CA	50	144	-	144	36
2,654,791	478,245	68825	G-061009	240	-	800	13	10	20	AB	43	329	-	329	82
2,655,591	474,984	115706	G-098758	135	-	1000	13	10	20	DO	41	185	-	185	46
2,658,142	477,739	60120	G-052563	160	-	800	13	10	21	BO	41	219	-	219	55
2,657,890	475,255	125702	G-105704	50	-	800	13	10	21	CB	42	68	-	68	17
2,663,535	475,318	56836	G-049353	137	-	650	13	10	22	CO	82	188	-	188	47
2,662,991	472,648	82234	G-073894	147	-	800	13	10	27	-	69	201	-	201	50
2,660,354	472,541	66145	G-058437	60	-	700	13	10	28	AC	43	82	-	82	21
2,658,246	471,310	63528	G-055914	200	-	900	13	10	28	BC	52	274	-	274	68
2,661,760	470,642	59970	G-052415	110	-	600	13	10	28	DA	67	151	-	151	38
2,655,022	472,990	63529	G-055915	150	-	800	13	10	29	AB	52	205	-	205	51
2,647,399	467,328	59421	G-051879	160	-	950	13	10	31	BB	96	219	-	219	55

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,610,763	522,725	73866	G-065871	150	-	850	14	8	1	AC	213	205	-	205	51
2,608,883	523,412	43086	G-035976	204	-	1200	14	8	1	BA	130	279	-	279	70
2,608,645	520,267	107409	G-096933	180	-	500	14	8	1	CC	120	246	-	246	62
2,603,776	520,760	54074	G-046657	160	-	900	14	8	2	CA	132	219	-	219	55
2,606,725	521,389	73580	G-065589	160	-	900	14	8	2	DA	190	219	-	219	55
2,600,705	523,226	80302	G-072139	120	-	650	14	8	3	AA	172	164	-	164	41
2,597,944	523,229	104851	G-091614	120	-	750	14	8	3	BB	122	164	-	164	41
2,597,988	520,526	121252	G-112438	120	-	750	14	8	3	CB	145	164	-	164	41
2,596,137	524,213	80285	G-072122	120	-	600	14	8	4	AA	154	164	-	164	41
2,596,060	522,439	60835	G-053273	160	-	550	14	8	4	AD	136	219	-	219	55
2,586,797	522,137	70267	G-062411	200	-	1000	14	8	5	BC	122	274	-	274	68
2,590,307	520,329	51519	G-044173	151	-	900	14	8	5	DD	120	207	-	207	52
2,590,041	517,726	47566	G-040328	240	-	700	14	8	8	AC	93	329	-	329	82
2,586,802	516,880	71085	G-063186	80	-	600	14	8	8	BC	112	110	-	110	27
2,595,398	517,866	78376	G-070210	153	-	800	14	8	9	AO	156	209	-	209	52
2,591,394	517,768	78777	G-070615	160	-	1000	14	8	9	BC	105	219	-	219	55
2,594,840	515,888	71086	G-063187	80	-	850	14	8	9	DB	136	110	-	110	27
2,600,659	518,630	151643	G-127321	280	-	1200	14	8	10	AA	150	383	-	383	96
2,597,411	517,229	66423	G-058723	80	-	700	14	8	10	BC	165	110	-	110	27
2,598,308	514,886	159821	G-128997	75	-	500	14	8	10	CD	135	103	-	103	26
2,600,750	516,588	166019	G-037709	160	-	700	14	8	10	DB	155	219	-	219	55
2,606,138	518,093	73673	G-065682	130	-	800	14	8	11	AO	275	178	-	178	45
2,603,499	518,055	42314	G-035237	160	-	650	14	8	11	BO	122	219	-	219	55
2,603,020	514,751	64984	G-057315	100	-	950	14	8	11	CC	248	137	-	137	34
2,605,586	516,108	55772	G-048312	220	-	1100	14	8	11	DB	160	301	-	301	75
2,612,237	518,748	72149	G-064207	160	-	800	14	8	12	AA	274	219	-	219	55
2,608,787	518,096	47589	G-040351	240	-	900	14	8	12	BC	190	329	-	329	82
2,611,774	512,551	163675	G-131085	177	-	780	14	8	13	AC	208	242	-	242	61
2,609,163	510,257	132307	G-033749	90	89	430	14	8	13	CB	119	123	149	149	37
2,610,644	508,919	113182	G-096581	65	30	900	14	8	13	CD	182	89	74	74	19
2,606,423	512,831	73674	G-065683	85	-	700	14	8	14	AO	155	116	-	116	29
2,603,229	510,775	72875	G-064906	150	-	700	14	8	14	CB	130	205	-	205	51
2,597,672	513,220	68797	G-060988	100	-	800	14	8	15	BB	145	137	-	137	34
2,598,547	509,987	44795	G-037637	140	-	1000	14	8	15	CA	119	192	-	192	48
2,601,807	510,732	56737	G-049256	160	-	900	14	8	15	DA	142	219	-	219	55
2,601,249	508,782	79524	G-071362	90	-	600	14	8	15	DC	135	123	-	123	31

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,595,861	509,940	42355	G-035273	140	-	1000	14	8	16	DB	132	192	-	192	48
2,589,818	510,466	64332	G-056690	120	-	850	14	8	17	DB	112	164	-	164	41
2,590,009	507,833	61033	G-053470	180	-	650	14	8	20	AB	106	246	-	246	62
2,596,796	506,557	66830	G-059115	160	-	1100	14	8	21	AD	240	219	-	219	55
2,594,054	507,951	66829	G-059114	40	-	600	14	8	21	BA	105	55	-	55	14
2,592,944	505,359	61336	G-053764	100	-	400	14	8	21	CB	101	137	-	137	34
2,596,927	504,903	45147	G-037984	145	-	900	14	8	21	DA	160	199	-	199	50
2,599,552	505,296	75535	G-067472	160	-	900	14	8	22	CA	208	219	-	219	55
2,603,182	506,566	43335	G-036212	100	120	1000	14	8	23	BC	200	137	184	184	46
2,604,932	506,494	113183	G-096582	55	53	671	14	8	23	BD	130	75	132	132	33
2,608,127	505,574	113184	G-096583	170	No Data	432	14	8	23	DA	132	233	0	0	0
2,609,434	507,530	113185	G-096584	130	132	850	14	8	24	BD	181	178	253	253	63
2,609,646	504,886	125876	G-105800	130	125	810	14	8	24	CA	180	178	311	311	78
2,612,200	504,918	116317	G-033753	130	130	725	14	8	24	DA	170	178	140	140	35
2,611,295	500,037	169687	G-135522	75	No Data	450	14	8	25	DB	140	103	0	0	0
2,606,504	503,377	62246	G-054656	200	120	800	14	8	26	AB	135	274	184	184	46
2,605,997	500,166	40782	G-033751	80	No Data	450	14	8	26	OO	155	110	0	0	0
2,589,241	499,678	75570	G-067505	160	-	550	14	8	29	CA	128	219	-	219	55
2,586,315	500,924	99427	G-087554	110	-	300	14	8	30	-	65	151	-	151	38
2,594,241	492,568	170410	G-136326	65	-	1000	14	8	33	CD	125	89	-	89	22
2,595,476	493,878	170409	G-136327	87	-	850	14	8	33	DB	125	119	-	119	30
2,606,303	497,012	76137	G-068060	110	57	1000	14	8	35	AB	176	151	103	103	26
2,611,474	495,720	62244	G-054654	200	158	800	14	8	36	-	135	274	286	286	72
2,608,701	496,990	113191	G-096587	0	No Data	460	14	8	36	BB	115	0	0	0	0
2,639,785	523,856	54445	G-047016	40	-	500	14	9	1	BC	42	55	-	55	14
2,635,263	521,766	122511	G-105753	240	-	650	14	9	2	CO	160	329	-	329	82
2,633,280	521,723	66668	G-058958	160	-	550	14	9	3	DA	195	219	-	219	55
2,627,189	524,061	176541	G-140041	160	-	750	14	9	4	AA	220	219	-	219	55
2,625,241	523,320	73575	G-065584	160	-	900	14	9	4	BD	202	219	-	219	55
2,627,304	521,422	113075	G-096904	130	-	800	14	9	4	DO	235	178	-	178	45
2,621,508	523,814	78560	G-070398	160	-	900	14	9	5	AB	224	219	-	219	55
2,618,627	523,016	60637	G-053078	130	-	900	14	9	5	BC	200	178	-	178	45
2,619,388	521,052	175462	G-140863	80	-	800	14	9	5	CD	200	110	-	110	27
2,614,022	523,423	158572	G-048425B	160	-	1000	14	9	6	BC	275	219	-	219	55
2,614,205	520,797	170711	G-138821	100	-	1000	14	9	6	CA	280	137	-	137	34
2,616,732	520,942	64848	G-057184	140	-	800	14	9	6	DO	104	192	-	192	48

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,616,353	518,282	150951	G-072842	60	-	900	14	9	7	AC	270	82	-	82	21
2,613,567	517,458	49612	G-042325	160	-	900	14	9	7	BC	195	219	-	219	55
2,614,308	515,515	73675	G-065684	170	-	1000	14	9	7	CO	150	233	-	233	58
2,633,077	519,051	61539	G-053963	70	-	900	14	9	10	AA	225	96	-	96	24
2,630,812	515,004	167115	G-135542	80	-	200	14	9	10	CD	175	110	-	110	27
2,632,824	517,710	170351	G-139140	136	-	700	14	9	10	DB	210	186	-	186	47
2,632,968	516,293	87040	G-078377	80	-	400	14	9	10	DD	161	110	-	110	27
2,637,989	519,189	159820	G-130797	80	-	1100	14	9	11	AB	108	110	-	110	27
2,634,769	518,457	130341	G-109287	40	-	400	14	9	11	BC	123	55	-	55	14
2,635,492	516,516	170362	G-136000	68	-	700	14	9	11	CB	130	93	-	93	23
2,641,391	515,996	55286	G-047830	120	-	900	14	9	12	CD	65	164	-	164	41
2,644,045	514,693	74550	G-066531	115	-	600	14	9	13	AA	80	157	-	157	39
2,642,763	514,727	60991	G-053428	160	-	600	14	9	13	AB	57	219	-	219	55
2,634,970	513,114	76467	G-068383	80	-	850	14	9	14	BC	153	110	-	110	27
2,635,080	511,738	169010	G-136617	100	-	1000	14	9	14	CB	175	137	-	137	34
2,633,043	512,445	172606	G-137529	140	-	800	14	9	15	AD	101	192	-	192	48
2,631,126	514,814	170356	G-136517	80	-	200	14	9	15	BA	159	110	-	110	27
2,630,320	512,147	146189	G-133366	110	-	800	14	9	15	CB	164	151	-	151	38
2,633,108	511,057	137609	G-114521	133	-	900	14	9	15	DD	166	182	-	182	46
2,627,701	513,550	157447	G-127133	160	-	900	14	9	16	AA	150	219	-	219	55
2,627,634	513,473	69931	G-062094	130	-	800	14	9	16	AO	193	178	-	178	45
2,614,733	511,212	99912	G-087929	150	124	720	14	9	18	CA	111	205	245	245	61
2,613,352	510,409	113196	G-096588	200	No Data	460	14	9	18	CB	117	274	0	0	0
2,617,260	504,910	125877	G-105801	130	142	850	14	9	19	DC	175	178	252	252	63
2,620,043	507,869	132304	G-054655	130	121	787	14	9	20	BA	160	178	233	233	58
2,619,957	506,332	40781	G-033750	500	>160	1100	14	9	20	CC	176	685	0	0	0
2,622,698	505,266	125878	G-105802	0	120	740	14	9	20	DD	195	0	278	278	70
2,625,321	506,092	40783	G-033752	400	>160	750	14	9	21	-	155	219(4)	No Data	219	55
2,626,694	506,075	40785	G-033754	200	No Data	400	14	9	21	-	169	274	No Data	274	68
2,625,214	507,985	160959	G-129063	320	-	1000	14	9	21	BC	170	438	-	438	110
2,625,209	508,095	94030	G-083866	0	-	800	14	9	21	BO	130	0	-	0	0
2,624,963	505,301	40786	G-033755	300	>160	400	14	9	21	CC	118	219(4)	26	26	7
2,628,012	504,591	51659	G-044312	75	No Data	1000	14	9	21	DC	165	103	136	136	34
2,632,495	509,007	56923	G-049439	240	-	950	14	9	22	AB	130	329	-	329	82
2,629,953	506,255	77324	G-069184	80	-	900	14	9	22	CB	162	110	-	110	27
2,629,999	504,936	53886	G-046472	80	-	800	14	9	22	CC	160	110	-	110	27

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,635,152	507,801	64375	G-056729	120	-	900	14	9	23	BC	136	164	-	164	41
2,635,914	505,838	82694	G-074349	120	-	1000	14	9	23	CD	82	164	-	164	41
2,636,659	503,244	20348	G-014822	280	-	1000	14	9	26	BA	49	383	-	383	96
2,635,926	503,312	125873	G-105797	130	-	650	14	9	26	BB	47	178	-	178	45
2,635,395	501,244	61193	G-053630	76	-	600	14	9	26	CB	96	104	-	104	26
2,631,364	503,696	5922	G-002341	85	-	940	14	9	27	BA	0	116	-	116	29
2,629,416	502,905	43211	G-036098	80	-	1000	14	9	27	BC	94	110	-	110	27
2,630,733	501,665	34853	G-028138	160	-	1200	14	9	27	CB	92	219	-	219	55
2,630,813	500,318	99112	G-087283	75	-	1200	14	9	27	CD	100	103	-	103	26
2,627,623	503,066	43336	G-036213	75	No Data	800	14	9	28	AO	167	103	No Data	103	26
2,625,333	502,770	113197	G-096589	100	No Data	800	14	9	28	BO	170	137	103	103	26
2,613,776	499,678	40778	G-033747	500	64	1200	14	9	30	CB	132	685	147	147	37
2,618,137	499,804	43337	G-036214	200	No Data	400	14	9	30	DD	130	274	0	0	0
2,621,640	497,763	175458	G-136422	24	No Data	300	14	9	32	BA	180	33	0	0	0
2,631,136	497,962	13866	G-009205	80	-	900	14	9	34	BA	92	110	-	110	27
2,630,238	498,344	59723	G-052170	60	-	500	14	9	34	BB	125	82	-	82	21
2,638,335	499,295	165141	G-047358	100	-	1600	14	9	35	AB	70	137	-	137	34
2,635,905	495,672	169694	G-136409	130	-	800	14	9	35	CB	115	178	-	178	45
2,636,623	494,993	177104	G-136409	90	-	800	14	9	35	CD	120	123	-	123	31
2,636,320	495,923	82696	G-074351	80	-	1000	14	9	35	DB	82	110	-	110	27
2,663,364	523,573	63907	G-056280	132	-	800	14	10	3	DB	277	181	-	181	45
2,656,633	525,900	72185	G-064243	101	-	600	14	10	4	BA	49	138	-	138	35
2,653,492	525,227	128037	G-107321	110	-	1000	14	10	5	AA	64	151	-	151	38
2,651,807	523,684	28696	G-022336	60	-	800	14	10	5	CA	83	82	-	82	21
2,654,149	523,139	72669	G-064703	50	-	500	14	10	5	DA	60	68	-	68	17
2,654,849	519,217	20787	G-015211	320	-	1200	14	10	8	AD	63	438	-	438	110
2,656,449	521,093	113269	G-096627	60	-	130	14	10	9	BA	60	82	-	82	21
2,667,855	511,905	65568	G-057881	100	-	200	14	10	14	CD	255	137	-	137	34
2,655,955	511,295	26786	G-020550	0	-	800	14	10	16	CC	53	0	-	0	0
2,659,538	513,493	16269	G-011280	70	-	1000	14	10	16	DA	77	96	-	96	24
2,659,904	511,554	64149	G-056514	40	-	750	14	10	16	DD	54	55	-	55	14
2,654,509	514,556	20395	G-014865	126	-	1000	14	10	17	-	60	173	-	173	43
2,654,612	511,906	20396	G-014866	105	-	1000	14	10	17	DA	42	144	-	144	36
2,646,782	510,920	58520	G-050995	150	-	800	14	10	18	CD	80	205	-	205	51
2,660,041	508,907	64148	G-056513	30	-	750	14	10	21	AD	61	41	-	41	10
2,656,877	509,493	119284	G-101198	100	-	700	14	10	21	BA	50	137	-	137	34

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,656,019	509,988	26787	G-020551	40	-	600	14	10	21	BB	47	55	-	55	14
2,656,090	508,671	26788	G-020552	40	-	600	14	10	21	BC	48	55	-	55	14
2,659,468	506,910	81487	G-073294	80	-	800	14	10	21	DB	64	110	-	110	27
2,666,747	505,055	112089	G-097797	0	-	200	14	10	26	BB	240	0	-	0	0
2,661,697	501,034	3650	G-000377	186	-	1000	14	10	27	CC	53	255	-	255	64
2,658,404	501,520	49065	G-041786	140	-	1250	14	10	28	-	65	192	-	192	48
2,658,523	504,371	81662	G-073449	160	-	800	14	10	28	AB	50	219	-	219	55
2,657,610	504,779	57652	G-050151	140	-	800	14	10	28	BA	51	192	-	192	48
2,657,101	504,927	90371	G-081565	125	-	1000	14	10	28	BB	50	171	-	171	43
2,645,796	502,965	58958	G-051424	120	-	490	14	10	30	BC	78	164	-	164	41
2,646,554	503,655	136953	G-113392	0	-	400	14	10	30	BO	79	0	-	0	0
2,648,203	495,779	27484	G-021194	160	-	800	14	10	31	-	75	219	-	219	55
2,646,668	498,252	169693	G-135895	65	-	800	14	10	31	BC	114	89	-	89	22
2,661,046	500,312	13661	G-009033	160	-	1500	14	10	33	AA	70	219	-	219	55
2,657,971	496,890	61220	G-053656	160	-	900	14	10	33	CA	51	219	-	219	55
2,658,047	495,572	69456	G-061620	40	-	400	14	10	33	CD	55	55	-	55	14
2,660,606	497,022	59969	G-052414	160	-	850	14	10	33	DA	81	219	-	219	55
2,663,146	498,453	8019	G-004184	240	-	800	14	10	34	BD	70	329	-	329	82
2,661,238	497,690	110243	G-094585	80	-	900	14	10	34	CB	51	110	-	110	27
2,608,603	531,249	26529	G-020313	200	-	1200	15	8	25	CA	128	274	-	274	68
2,611,047	530,993	44794	G-037636	180	-	1100	15	8	25	DC	122	246	-	246	62
2,611,211	530,658	176565	G-140862	3	-	75	15	8	25	DD	95	4	-	4	1
2,603,347	531,039	53968	G-046552	115	-	700	15	8	26	CD	139	157	-	157	39
2,604,941	531,839	59224	G-051686	40	-	800	15	8	26	DB	136	55	-	55	14
2,605,010	530,522	69919	G-062082	77	-	700	15	8	26	DC	129	105	-	105	26
2,597,603	530,967	84869	G-076374	132	-	650	15	8	27	CC	126	181	-	181	45
2,592,368	530,855	109399	G-094011	0	-	800	15	8	28	CC	145	0	-	0	0
2,589,201	528,683	59302	G-051762	160	-	750	15	8	32	AB	115	219	-	219	55
2,591,407	524,632	113193	G-097207	35	-	350	15	8	32	DD	120	48	-	48	12
2,596,171	527,476	70227	G-062375	60	-	750	15	8	33	AD	125	82	-	82	21
2,592,558	528,251	80286	G-072123	230	-	850	15	8	33	BA	153	315	-	315	79
2,593,326	526,170	74254	G-066246	160	-	800	15	8	33	CA	131	219	-	219	55
2,596,053	524,935	54518	G-047089	153	-	900	15	8	33	DD	130	209	-	209	52
2,600,716	524,444	29812	G-023385	80	-	600	15	8	34	-	125	110	-	110	27
2,598,646	525,682	50266	G-042956	80	-	400	15	8	34	-	125	110	-	110	27
2,599,297	528,293	169692	G-073751	130	-	700	15	8	34	AC	135	178	-	178	45

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,597,927	528,136	157787	G-127250	110	-	550	15	8	34	BD	140	151	-	151	38
2,598,696	525,024	73985	G-065987	155	-	700	15	8	34	CD	120	212	-	212	53
2,603,064	528,589	79525	G-071363	130	-	700	15	8	35	BB	135	178	-	178	45
2,611,836	528,695	42382	G-035300	68	-	900	15	8	36	-	115	93	-	93	23
2,610,568	529,331	95399	G-084655	39	-	400	15	8	36	AB	138	53	-	53	13
2,610,545	528,001	85302	G-076735	76	-	750	15	8	36	AC	117	104	-	104	26
2,608,866	529,287	44836	G-037677	160	-	1000	15	8	36	BA	130	219	-	219	55
2,608,891	525,971	121253	G-109448	150	-	750	15	8	36	CA	121	205	-	205	51
2,611,950	526,043	59472	G-051927	151	-	850	15	8	36	DA	113	207	-	207	52
2,627,210	555,126	40498	G-033471	120	-	800	15	9	3	BC	105	164	-	164	41
2,621,261	554,859	111986	G-095489	118	-	500	15	9	5	AD	204	162	-	162	40
2,620,641	552,821	166021	G-022518	130	-	650	15	9	5	DA	360	178	-	178	45
2,612,007	554,466	58708	G-051178	420	-	900	15	9	6	BC	253	575	-	575	144
2,626,077	547,760	66537	G-058833	130	-	900	15	9	9	DO	315	178	-	178	45
2,641,254	551,669	63790	G-056172	100	-	800	15	9	12	AB	58	137	-	137	34
2,626,818	545,847	59221	G-051683	160	-	900	15	9	16	AA	187	219	-	219	55
2,617,658	545,433	56400	G-048932	160	-	800	15	9	17	BB	353	219	-	219	55
2,618,350	544,790	55121	G-047668	120	-	250	15	9	17	BO	125	164	-	164	41
2,613,173	544,570	71895	G-063973	160	-	600	15	9	18	BD	216	219	-	219	55
2,612,436	542,563	59789	G-052237	80	-	650	15	9	18	CB	187	110	-	110	27
2,618,047	540,330	102750	G-092480	120	-	700	15	9	20	BB	324	164	-	164	41
2,623,523	539,624	111979	G-096299	125	-	800	15	9	21	BC	350	171	-	171	43
2,632,853	539,392	169689	G-136373	120	-	200	15	9	22	AD	239	164	-	164	41
2,629,190	537,368	57385	G-049891	130	-	900	15	9	22	CO	279	178	-	178	45
2,635,846	537,458	167934	G-135560	200	-	800	15	9	23	DC	209	274	-	274	68
2,640,436	538,406	68850	G-061031	113	-	750	15	9	24	CA	48	155	-	155	39
2,613,242	535,055	142572	G-069761	200	-	650	15	9	30	BB	320	274	-	274	68
2,612,994	530,714	74376	G-066364	160	-	800	15	9	30	CC	286	219	-	219	55
2,613,262	525,423	66030	G-058325	40	-	1000	15	9	31	CC	161	55	-	55	14
2,620,398	527,781	96791	G-085522	240	-	1200	15	9	32	BD	210	329	-	329	82
2,618,516	525,630	79331	G-071170	110	-	700	15	9	32	CC	197	151	-	151	38
2,625,120	525,948	77350	G-069208	235	-	1000	15	9	33	CD	192	322	-	322	80
2,629,488	526,885	106078	G-090720	135	-	800	15	9	34	CB	263	185	-	185	46
2,645,496	529,372	124031	G-104278	139	-	500	15	10	31	-	61	190	-	190	48
2,644,241	530,762	130103	G-108647	85	-	500	15	10	31	BB	60	116	-	116	29
2,644,633	529,305	64499	G-056849	95	-	800	15	10	31	BC	60	130	-	130	33

Table 2-11
Irrigation Wells and Estimated Pumping Rates, 1996 to 2005
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Acres for ARDC Wells	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Section	Sub-Section	Total Depth (ft bgs)	Pumping Rate Based on Average Net Irrig. Req. over Irrigation Season (gpm)	Average Seasonal Pumping Rate (1996-2005) for ARDC Irrigation Wells (gpm)	Simulated Transient (Seasonal Avg.) Pumping Rate (gpm)	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)
2,653,212	530,397	173328	G-137912	78	-	800	15	10	32	AA	120	107	-	107	27
2,650,680	527,623	23048	G-017199	160	-	1100	15	10	32	CO	81	219	-	219	55
2,652,217	527,684	42969	G-035862	130	-	1250	15	10	32	DC	78	178	-	178	45
2,657,817	529,948	65752	G-058058	60	-	1000	15	10	33	AC	46	82	-	82	21
2,656,541	528,563	73905	G-065908	60	-	600	15	10	33	CA	49	82	-	82	21
2,655,264	527,177	58401	G-050879	75	-	800	15	10	33	CC	59	103	-	103	26
2,657,858	528,629	65751	G-058057	40	-	700	15	10	33	DB	46	55	-	55	14
2,661,214	526,813	23050	G-017201	220	-	1100	15	10	34	-	85	301	-	301	75
2,660,932	530,075	58400	G-050878	20	-	900	15	10	34	BC	50	27	-	27	7
2,661,154	528,096	27800	G-021492	134	-	650	15	10	34	CC	62	183	-	183	46

Notes:
1) Pumping simulated for only one well per quarter section if total acreage for quarter section exceeds 160 acres, or total acreage of section exceeds 640 acres.
2) "Max. Irrigation Rate" is the peak pumping rate (during reproductive stage of development, typically in July)
assuming that all of the water will come from irrigation and none will come from precipitation or soil water storage.
The rate is based on a peak Crop Water Use of 0.33 inches per day, or 4.24gpm/acre, and an 80% water application efficiency.
The 4.24gpm/acre value is from "Minimum Center Pivot Design Capacities in Nebraska" (IANR, 1989).
This rate is a peak rate, and when used as an average rate over the season, results in greater dewatering than is supported by groundwater level observations.
3) The average net irrrigation requirement is 6.68 inches for fully irrigated corn based on temperature and precipitation data for Wahoo for the period 1949-2004.
From "2006 Annual Evaluation of Hydrologically Connected Water Supplies" (NDNR, 2005).
The estimated rate assumes a 92-day (June, July, and August) irrigation season, and assumes 100% water application efficiency.
Although the pumping rate must be higher than 6.68 inches due to inefficiencies in water application,
the reduction in rate due to the assumption of 100% efficiency is meant to compensate for the unknown number of unused wells in fallow fields or pasture.
4) The total regostered acreage of wells in a section often exceed 640 acres.
Aerial photos were used in some instances to estimate acreage for wells having registered acreage greater than 160.
5) Location from ARDC survey. All other locations from registration coordinates.

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,635,179	457,916	61191	G-053628	120	900	12	9	3	DO	80	1976		0	0	0	0	0	41	41	41	41	0
2,626,206	461,153	81108	G-072920	80	400	12	9	4	BB	90	1990		0	0	0	0	0	0	0	27	27	27
2,602,215	487,428	170110	G-135474	280	550	13	8	3	DC	180	1982		0	0	0	0	0	0	96	96	96	96
2,593,198	486,971	134936	G-112045	0	0	13	8	9	O	240	1995		0	0	0	0	0	0	0	0	0	0
2,599,802	485,900	82860	G-074511	135	600	13	8	10	BO	165	1982		0	0	0	0	0	0	46	46	46	46
2,599,803	484,548	81051	G-072863	140	700	13	8	10	CB	205	1990		0	0	0	0	0	0	0	48	48	48
2,601,676	484,633	81052	G-072864	70	400	13	8	10	DB	185	1990		0	0	0	0	0	0	0	24	24	24
2,605,005	486,102	65312	G-057633	80	800	13	8	11	BO	170	1977		0	0	0	0	0	27	27	27	27	27
2,608,143	483,511	71102	G-063202	133	480	13	8	11	O	155	1976		0	0	0	0	0	46	46	46	46	46
2,610,553	479,666	78743	G-070581	155	1000	13	8	13	BC	205	1987	02/2006	0	0	0	0	0	0	0	53	53	0
2,610,561	479,696	124740	G-139933	155	800	13	8	13	BD	198	2000		0	0	0	0	0	0	0	0	0	53
2,613,899	479,133	65173	G-057497	160	700	13	8	13	DA	120	1977		0	0	0	0	0	55	55	55	55	55
2,597,521	479,180	100924	G-088853	130	700	13	8	16	DA	246	1996		0	0	0	0	0	0	0	0	0	45
2,608,352	470,332	111977	G-096372	250	700	13	8	26	AO	140	1998		0	0	0	0	0	0	0	0	0	86
2,643,731	492,946	102747	G-093865	120	750	13	9	1	AB	98	1997		0	0	0	0	0	0	0	0	0	41
2,643,408	491,946	121124	G-106045	30	200	13	9	1	AC	78	1999		0	0	0	0	0	0	0	0	0	10
2,641,794	492,172	159166	G-128147	0	0	13	9	1	BC	65	2004		0	0	0	0	0	0	0	0	0	0
2,641,811	490,245	5723	G-002172	160	0	13	9	1	CO	?	1956		0	55	55	55	55	55	55	55	55	55
2,636,529	489,925	166038	G-134121	150	800	13	9	2	CC	145	2005		0	0	0	0	0	0	0	0	0	0
2,633,146	493,215	59908	G-052354	160	900	13	9	3	AB	113	1976		0	0	0	0	0	55	55	55	55	55
2,633,231	490,577	61222	G-053658	100	900	13	9	3	DB	142	1976		0	0	0	0	0	34	34	34	34	34
2,628,551	492,400	87038	G-078375	275	750	13	9	4	AB	125	1984		0	0	0	0	0	0	94	94	94	94
2,625,896	492,252	59327	G-051786	160	850	13	9	4	BO	122	1976		0	0	0	0	0	55	55	55	55	55
2,623,868	492,824	59223	G-051685	80	800	13	9	5	AA	102	1976		0	0	0	0	0	27	27	27	27	27
2,623,023	489,507	86633	G-077970	227.1	800	13	9	5	DB	230	1993		0	0	0	0	0	0	0	0	78	78
2,620,667	489,385	81881	G-073545	65	900	13	9	5	O	220	1991		0	0	0	0	0	0	0	0	22	22
2,619,232	491,940	99532	G-087637	120	600	13	9	6	AA	??	1958		0	41	41	41	41	41	41	41	41	41
2,618,041	489,262	171258	G-136318	140	950	13	9	6	DO	?	1950		48	48	48	48	48	48	48	48	48	48
2,622,683	483,848	42290	G-035213	135	800	13	9	8	DC	110	1971		0	0	0	0	46	46	46	46	46	46
2,628,706	487,137	80939	G-072751	340	900	13	9	9	AB	200	1990		0	0	0	0	0	0	0	116	116	116
2,626,046	484,318	100360	G-088331	135	800	13	9	9	CC	225	1996		0	0	0	0	0	0	0	0	0	46
2,628,140	485,091	24278	G-018285	100	700	13	9	9	DB	203	1981		0	0	0	0	0	0	55	55	55	55
2,628,773	485,732	24277	G-018285	160	600	13	9	9	O	120	1956		0	55	55	55	55	55	34	34	34	34
2,633,275	487,156	167378	G-134176	70	800	13	9	10	AC	145	2005		0	0	0	0	0	0	0	0	0	0
2,630,732	486,524	65174	G-057498	160	900	13	9	10	BC	135	1977		0	0	0	0	0	55	55	55	55	55
2,633,419	485,276	61375	G-053801	160	600	13	9	10	DB	95	1976		0	0	0	0	0	55	55	55	55	55
2,637,438	484,094	7820	G-004004	50	1000	13	9	11	CD	50	1956		0	17	17	17	17	17	17	17	17	17
2,639,386	484,836	55242	G-047789	80	800	13	9	11	DO	82	1975		0	0	0	0	27	27	27	27	27	27
2,642,547	488,271	7643	G-003848	80	1000	13	9	12	BA	59	1937		27	27	27	27	27	27	27	27	27	27

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,645,742	483,954	141459	G-116504	90	800	13	9	12	DD	65	2002		0	0	0	0	0	0	0	0	0	0
2,644,712	483,745	37552	G-030654	220	1200	13	9	12	O	70	1968		0	0	0	75	75	75	75	75	75	75
2,645,404	483,101	57677	G-050176	160	900	13	9	13	AA	72	1976		0	0	0	0	0	55	55	55	55	55
2,641,514	481,602	57678	G-050177	160	1000	13	9	13	BC	77	1976		0	0	0	0	0	55	55	55	55	55
2,642,895	480,344	54796	G-047357	137	1000	13	9	13	CA	85	1975		0	0	0	0	47	47	47	47	47	47
2,644,164	481,003	130750	G-109619	26	670	13	9	13	DB	54	2001		0	0	0	0	0	0	0	0	0	0
2,644,277	479,087	8001	G-004168	35	700	13	9	13	DC	83	1956		0	12	12	12	12	12	12	12	12	12
2,636,332	482,137	169005	G-139424	116	50	13	9	14	BB	80	2005		0	0	0	0	0	0	0	0	0	0
2,631,579	481,917	59402	G-051860	160	850	13	9	15	BO	134	1976		0	0	0	0	0	55	55	55	55	55
2,629,634	481,169	60636	G-053077	160	850	13	9	16	AD	113	1976		0	0	0	0	0	55	55	55	55	62
2,627,455	483,026	87039	G-078376	80	400	13	9	16	BA	200	1989		0	0	0	0	0	0	0	27	27	27
2,626,998	481,045	66478	G-058774	80	360	13	9	16	BD	135	1977		0	0	0	0	0	27	27	27	27	27
2,629,665	478,469	40499	G-033472	120	500	13	9	16	DD	105	1970		0	0	0	41	41	41	41	41	41	41
2,624,230	482,238	59328	G-051787	160	650	13	9	17	AA	115	1976		0	0	0	0	0	55	55	55	55	55
2,618,921	481,253	171088	G-136149	89	600	13	9	18	AD	119	1992		0	0	0	0	0	0	0	0	30	30
2,615,223	477,870	54398	G-046970	160	750	13	9	18	CC	78	1975		0	0	0	0	55	55	55	55	55	55
2,617,221	478,589	37578	G-030678	180	750	13	9	18	DC	90	1968		0	0	0	62	62	62	62	62	62	62
2,618,596	476,047	169011	G-048035	120	600	13	9	19	AO	93	1975		0	0	0	0	41	41	41	41	41	41
2,618,596	476,047	55492	G-048035	160	700	13	9	19	AO	78	2005		0	0	0	0	0	0	0	0	0	0
2,616,593	476,599	67438	G-059681	75	1100	13	9	19	BA	117	1978		0	0	0	0	0	26	26	26	26	26
2,619,688	474,326	24795	G-018747	100	250	13	9	19	DA	75	1955		34	34	34	34	34	0	0	0	0	0
2,619,338	474,071	66950	G-059231	100	300	13	9	19	DA	90	1977		0	0	0	0	0	34	34	34	34	34
2,620,524	476,762	66524	G-058820	175	900	13	9	20	BB	99	1977		0	0	0	0	0	60	60	60	60	60
2,621,960	474,183	70393	G-062530A	160	400	13	9	20	CA	72	1979		0	0	0	0	0	55	55	55	27	27
2,622,002	474,005	70394	G-062530E	160	350	13	9	20	CA	93	1979		0	0	0	0	0	0	0	0	0	0
2,621,351	473,531	96480	G-085344	137	500	13	9	20	CA	103	1995		0	0	0	0	0	0	0	0	47	47
2,626,510	473,638	171089	G-136150	260	800	13	9	21	CC	110	1977		0	0	0	0	0	89	89	89	89	89
2,633,844	476,036	65313	G-057634	320	1000	13	9	22	AC	154	1977		0	0	0	0	0	110	110	110	110	110
2,631,146	477,249	71989	G-064065	150	700	13	9	22	BB	118	1979		0	0	0	0	0	51	51	51	51	51
2,639,705	477,241	157114	G-132237	100	0	13	9	23	AA	80	2004		0	0	0	0	0	0	0	0	0	0
2,637,394	474,771	154861	G-127035	100	400	13	9	23	CA	125	2004		0	0	0	0	0	0	0	0	0	0
2,644,379	476,422	8002	G-004169	35	700	13	9	24	AC	91	1956		0	12	12	12	12	12	12	12	12	12
2,642,427	474,359	163752	G-132249	140	1000	13	9	24	CO	58	2004		0	0	0	0	0	0	0	0	0	0
2,643,489	470,451	21909	G-016190	200	700	13	9	25	CA	49	1956		0	68	68	68	68	68	68	68	68	68
2,644,878	468,099	154862	G-127071	150	700	13	9	25	DC	80	2004		0	0	0	0	0	0	0	0	0	0
2,646,418	469,230	136179	G-113882	85	800	13	9	25	DD	67	2001		0	0	0	0	0	0	0	0	0	0
2,623,017	465,646	146174	G-119684	100	700	13	9	32	AB	155	2002		0	0	0	0	0	0	0	0	0	0
2,621,011	466,220	67299	G-059551	80	450	13	9	32	BB	155	1977		0	0	0	0	0	27	27	27	27	27
2,629,718	465,845	159089	G-127545	65	500	13	9	33	AC	130	2004		0	0	0	0	0	0	0	0	0	0

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,630,445	462,658	67297	G-059549	80	0	13	9	33	DD	103	1977		0	0	0	0	0	27	27	27	27	27
2,625,854	463,119	67298	G-059550	0	400	13	9	33	O	117	1977		0	0	0	0	0	0	0	0	0	0
2,625,737	464,448	112723	G-096371	160	700	13	9	33	O	170	1998		0	0	0	0	0	0	0	0	0	55
2,638,290	462,981	61192	G-053629	80	700	13	9	35	CD	96	1976		0	0	0	0	0	27	27	27	27	27
2,646,092	467,270	74635	G-066614	108	600	13	9	36	AA	83	1981		0	0	0	0	0	0	37	37	37	37
2,665,980	494,614	63906	G-056279	160	900	13	10	3	AA	177	1977		0	0	0	0	0	55	55	55	55	55
2,664,663	494,552	59375	G-051833	160	850	13	10	3	AB	197	1976		0	0	0	0	0	0	0	0	0	0
2,663,380	494,452	42554	G-035461	85	1000	13	10	3	BA	56	1971		0	0	0	0	29	29	29	29	29	29
2,662,132	491,793	4083	G-000744	160	0	13	10	3	CB	?	1956		0	55	55	55	55	55	55	55	55	55
2,662,287	491,290	140664	G-116108	90	700	13	10	3	CB	50	2002		0	0	0	0	0	0	0	0	0	0
2,664,768	491,916	5551	G-002022	90	350	13	10	3	DB	72	1956		0	31	31	31	31	0	0	0	0	0
2,664,820	490,598	64487	G-056838	160	700	13	10	3	DC	154	1977		0	0	0	0	0	55	55	55	55	55
2,666,723	491,277	103896	G-096225	10	45	13	10	3	DD	287	1995		0	0	0	0	0	0	0	0	3	3
2,658,832	491,034	90565	G-081652	135	850	13	10	4	CA	51	1994		0	0	0	0	0	0	0	0	46	46
2,660,875	490,422	63905	G-056278	40	700	13	10	4	DD	53	1977		0	0	0	0	0	14	14	14	14	14
2,647,861	487,194	75689	G-067620	220	1000	13	10	7	BD	78	1981		0	0	0	0	0	0	75	75	75	75
2,647,294	485,182	113192	G-110360	100	700	13	10	7	CO	75	1998		0	0	0	0	0	0	0	0	0	34
2,655,831	484,957	68690	G-060900	65	700	13	10	8	DD	60	1978		0	0	0	0	0	22	22	22	22	22
2,658,967	488,378	91816	G-082391	157	800	13	10	9	-	52	1994		0	0	0	0	0	0	0	0	54	54
2,660,838	489,061	90566	G-081653	78	1035	13	10	9	AA	50	1994		0	0	0	0	0	0	0	0	27	27
2,659,608	489,061	77664	G-069511	80	700	13	10	9	AB	65	1937		27	27	27	27	27	27	27	27	27	27
2,658,289	489,014	28879	G-022506	160	1000	13	10	9	BA	60	1963		0	0	55	55	55	0	0	0	0	0
2,656,971	488,967	64150	G-056515	130	900	13	10	9	BB	26	1976		0	0	0	0	0	45	45	45	45	0
2,657,086	488,362	130829	G-109425	65	150	13	10	9	BB	50	2000		0	0	0	0	0	0	0	0	0	22
2,657,777	485,696	100047	G-088058	0	850	13	10	9	CO	116	1996		0	0	0	0	0	0	0	0	0	0
2,660,414	485,789	100048	G-088059	0	850	13	10	9	DO	86	1996		0	0	0	0	0	0	0	0	0	0
2,665,577	488,332	25201	G-019114	153	1000	13	10	10	-	172	1956		0	52	52	52	52	52	52	52	52	52
2,662,677	489,787	38884	G-031913	160	1100	13	10	10	BB	57	1969		0	0	0	55	55	55	55	55	55	55
2,662,357	486,519	4084	G-000745	80	0	13	10	10	CB	?	1955		27	27	27	27	27	27	27	27	27	27
2,661,844	484,444	25098	G-019020	40	1000	13	10	15	BB	51	1934		14	14	14	14	14	14	14	14	14	14
2,663,120	483,262	101558	G-089306	65	850	13	10	15	BB	61	1996		0	0	0	0	0	0	0	0	0	22
2,660,659	480,472	48849	G-041584	154	1000	13	10	16	DO	84	1974		0	0	0	0	53	53	53	53	53	53
2,655,527	480,289	63526	G-055912	135	800	13	10	17	-	49	1977		0	0	0	0	0	46	46	46	46	46
2,652,897	480,192	63527	G-055913	140	800	13	10	17	-	39	1977		0	0	0	0	0	48	48	48	48	48
2,655,259	482,919	60342	G-052785	160	800	13	10	17	AO	52	1975		0	0	0	0	55	55	55	55	55	27
2,651,936	483,456	60343	G-052786	80	750	13	10	17	BB	52	1976		0	0	0	0	0	27	27	27	27	55
2,653,362	480,869	69538	G-061703	105	600	13	10	17	CA	50	1979		0	0	0	0	0	0	0	0	0	0
2,654,791	478,245	68825	G-061009	240	800	13	10	20	AB	43	1979		0	0	0	0	0	82	82	82	82	82
2,655,591	474,984	115706	G-098758	135	1000	13	10	20	DO	41	1998		0	0	0	0	0	0	0	0	0	46

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,658,142	477,739	60120	G-052563	160	800	13	10	21	BO	41	1976		0	0	0	0	0	55	55	55	55	55
2,657,890	475,255	125702	G-105704	50	800	13	10	21	CB	42	2000		0	0	0	0	0	0	0	0	0	17
2,663,535	475,318	56836	G-049353	137	650	13	10	22	CO	82	1976		0	0	0	0	0	47	47	47	47	47
2,662,991	472,648	82234	G-073894	147	800	13	10	27	-	69	1991		0	0	0	0	0	0	0	0	50	50
2,660,354	472,541	66145	G-058437	60	700	13	10	28	AC	43	1977		0	0	0	0	0	21	21	21	21	21
2,658,246	471,310	63528	G-055914	200	900	13	10	28	BC	52	1977		0	0	0	0	0	68	68	68	68	68
2,661,760	470,642	59970	G-052415	110	600	13	10	28	DA	67	1976		0	0	0	0	0	38	38	38	38	55
2,655,022	472,990	63529	G-055915	150	800	13	10	29	AB	52	1977		0	0	0	0	0	51	51	51	51	51
2,647,399	467,328	59421	G-051879	160	950	13	10	31	BB	96	1976		0	0	0	0	0	55	55	55	55	55
2,610,763	522,725	73866	G-065871	150	850	14	8	1	AC	213	1981		0	0	0	0	0	0	51	51	51	51
2,608,883	523,412	43086	G-035976	204	1200	14	8	1	BA	130	1972		0	0	0	0	70	70	70	70	70	70
2,608,488	520,361	64983	G-057314	144	950	14	8	1	CC	190	1977		0	0	0	0	0	49	49	49	49	0
2,608,645	520,267	107409	G-096933	180	500	14	8	1	CC	120	1997		0	0	0	0	0	0	0	0	0	62
2,603,776	520,760	54074	G-046657	160	900	14	8	2	CA	132	1975		0	0	0	0	55	55	55	55	55	55
2,606,725	521,389	73580	G-065589	160	900	14	8	2	DA	190	1981		0	0	0	0	0	0	55	55	55	55
2,600,705	523,226	80302	G-072139	120	650	14	8	3	AA	172	1989		0	0	0	0	0	0	0	41	41	41
2,597,944	523,229	104851	G-091614	120	750	14	8	3	BB	122	1997		0	0	0	0	0	0	0	0	0	41
2,597,988	520,526	121252	G-112438	120	750	14	8	3	CB	145	1999		0	0	0	0	0	0	0	0	0	41
2,596,137	524,213	80285	G-072122	120	600	14	8	4	AA	154	1989		0	0	0	0	0	0	0	41	41	41
2,596,060	522,439	60835	G-053273	160	550	14	8	4	AD	136	1976		0	0	0	0	0	55	55	0	0	0
2,586,797	522,137	70267	G-062411	200	1000	14	8	5	BC	122	1979		0	0	0	0	0	68	68	68	68	68
2,590,307	520,329	51519	G-044173	151	900	14	8	5	DD	120	1975		0	0	0	0	52	52	52	52	52	52
2,590,041	517,726	47566	G-040328	240	700	14	8	8	AC	93	1973	05/1979	0	0	0	0	82	38	38	38	38	38
2,590,062	517,766	47565	G-040328	110	600	14	8	8	AO	92	1979		0	0	0	0	0	0	0	0	0	0
2,586,802	516,880	71085	G-063186	80	600	14	8	8	BC	112	1980		0	0	0	0	0	27	27	27	0	0
2,588,800	516,258	170959	G-136275	80	0	14	8	8	CA	115	2005		0	0	0	0	0	0	0	0	0	0
2,595,398	517,866	78376	G-070210	153	800	14	8	9	AO	156	1985		0	0	0	0	0	0	52	52	52	52
2,591,394	517,768	78777	G-070615	160	1000	14	8	9	BC	105	1987		0	0	0	0	0	0	0	55	55	55
2,596,159	515,891	68796	G-060987	120	800	14	8	9	DA	156	1978		0	0	0	0	0	41	34	34	34	34
2,594,840	515,888	71086	G-063187	80	850	14	8	9	DB	136	1980		0	0	0	0	0	0	27	27	27	27
2,600,801	515,355	44866	G-037707	160	650	14	8	10	-	101	1972		0	0	0	0	55	55	55	55	55	55
2,600,659	518,630	151643	G-127321	280	1200	14	8	10	AA	150	2003		0	0	0	0	0	0	0	0	0	0
2,599,994	518,611	98823	G-087076	94	750	14	8	10	AB	150	1996		0	0	0	0	0	0	0	0	0	32
2,597,411	517,229	66423	G-058723	80	700	14	8	10	BC	165	1977		0	0	0	0	0	27	27	27	27	27
2,598,308	514,886	159821	G-128997	75	500	14	8	10	CD	135	2004		0	0	0	0	0	0	0	0	0	0
2,600,719	516,647	44868	G-037709	120	700	14	8	10	DB	107	1972		0	0	0	0	41	41	41	41	41	41
2,600,750	516,588	166019	G-037709	160	700	14	8	10	DB	155	2005		0	0	0	0	0	0	0	0	0	0
2,606,138	518,093	73673	G-065682	130	800	14	8	11	AO	275	1981		0	0	0	0	0	0	45	45	45	45
2,603,499	518,055	42314	G-035237	160	650	14	8	11	BO	122	1971		0	0	0	0	55	55	55	55	55	55

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,603,020	514,751	64984	G-057315	100	950	14	8	11	CC	248	1977		0	0	0	0	0	34	34	34	34	34
2,605,586	516,108	55772	G-048312	220	1100	14	8	11	DB	160	1975		0	0	0	0	75	75	75	75	75	75
2,612,237	518,748	72149	G-064207	160	800	14	8	12	AA	274	1980		0	0	0	0	0	55	55	55	55	55
2,608,787	518,096	47589	G-040351	240	900	14	8	12	BC	190	1973		0	0	0	0	82	82	82	82	82	82
2,611,774	512,551	163675	G-131085	177	780	14	8	13	AC	208	1989		0	0	0	0	0	0	0	61	61	61
2,609,163	510,257	132307	G-033749	90	430	14	8	13	CB	119	2001		0	0	31	31	31	31	31	31	29	15
2,610,644	508,919	113182	G-096581	65	900	14	8	13	CD	182	1977		0	0	0	0	0	22	22	22	18	18
2,606,423	512,831	73674	G-065683	85	700	14	8	14	AO	155	1981		0	0	0	0	0	0	29	29	29	29
2,606,423	512,824	124741	G-118340	85	650	14	8	14	AO	240	2000		0	0	0	0	0	0	0	0	0	29
2,603,229	510,775	72875	G-064906	150	700	14	8	14	CB	130	1980		0	0	0	0	0	51	51	51	51	51
2,597,672	513,220	68797	G-060988	100	800	14	8	15	BB	145	1978		0	0	0	0	0	34	0	0	0	0
2,597,762	511,903	54506	G-047077	130	1000	14	8	15	BC	120	1975		0	0	0	0	45	0	0	0	0	0
2,598,547	509,987	44795	G-037637	140	1000	14	8	15	CA	119	1972		0	0	0	0	48	48	48	48	48	48
2,601,807	510,732	56737	G-049256	160	900	14	8	15	DA	142	1976		0	0	0	0	0	55	55	0	0	0
2,601,249	508,782	79524	G-071362	90	600	14	8	15	DC	135	1989		0	0	0	0	0	0	0	31	31	31
2,595,861	509,940	42355	G-035273	140	1000	14	8	16	DB	132	1971		0	0	0	0	48	48	48	48	48	48
2,596,781	509,910	61034	G-053471	80	450	14	8	16	DD	102	1976	04/2004	0	0	0	0	0	0	0	0	0	0
2,589,818	510,466	64332	G-056690	120	850	14	8	17	DB	112	1977		0	0	0	0	0	41	41	41	41	41
2,590,009	507,833	61033	G-053470	180	650	14	8	20	AB	106	1976		0	0	0	0	0	62	62	62	62	0
2,596,692	507,873	66257	G-058543	130	700	14	8	21	AA	123	1977		0	0	0	0	0	45	45	45	45	45
2,596,796	506,557	66830	G-059115	160	1100	14	8	21	AD	240	1977		0	0	0	0	0	0	0	0	0	0
2,594,054	507,951	66829	G-059114	40	600	14	8	21	BA	105	1977		0	0	0	0	0	14	14	14	14	14
2,592,944	505,359	61336	G-053764	100	400	14	8	21	CB	101	1976		0	0	0	0	0	34	34	34	34	34
2,596,927	504,903	45147	G-037984	145	900	14	8	21	DA	160	1972		0	0	0	0	50	50	50	50	50	50
2,599,552	505,296	75535	G-067472	160	900	14	8	22	CA	208	1981		0	0	0	0	0	0	55	55	55	55
2,603,182	506,566	43335	G-036212	100	1000	14	8	23	BC	200	1971		0	0	0	0	34	34	34	34	67	38
2,604,932	506,494	113183	G-096582	55	671	14	8	23	BD	130	1975		0	0	0	0	19	19	19	19	28	24
2,608,127	505,574	113184	G-096583	170	432	14	8	23	DA	132	1942		58	58	58	58	58	58	58	58	0	0
2,609,434	507,530	113185	G-096584	130	850	14	8	24	BD	181	1977		0	0	0	0	0	45	45	45	73	42
2,609,646	504,886	125876	G-105800	130	810	14	8	24	CA	180	2000		0	0	0	0	0	0	0	0	0	0
2,613,361	506,067	40784	G-033753	135	900	14	8	24	DA	154	1969	10/1999	0	0	0	0	0	0	0	0	0	36
2,612,200	504,918	116317	G-033753	130	725	14	8	24	DA	170	1998		0	0	0	46	46	46	46	46	78	0
2,611,295	500,037	169687	G-135522	75	450	14	8	25	DB	140	2005		0	0	0	0	0	0	0	0	0	0
2,606,504	503,377	62246	G-054656	200	800	14	8	26	AB	135	1975		0	0	0	0	68	68	68	68	67	38
2,605,997	500,166	40782	G-033751	80	450	14	8	26	OO	155	1966		0	0	0	27	27	27	27	27	27	27
2,589,241	499,678	75570	G-067505	160	550	14	8	29	CA	128	1981		0	0	0	0	0	0	55	55	55	55
2,586,315	500,924	99427	G-087554	110	300	14	8	30	-	65	1975		0	0	0	0	38	38	38	38	38	38
2,586,284	501,723	99428	G-087555	110	0	14	8	30	-	65	1991		0	0	0	0	0	0	0	0	0	0
2,594,241	492,568	170410	G-136326	65	1000	14	8	33	CD	125	1995		0	0	0	0	0	0	0	0	22	22

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,595,476	493,878	170409	G-136327	87	850	14	8	33	DB	125	1993		0	0	0	0	0	0	0	0	30	30
2,599,345	496,081	156062	G-135892	180	0	14	8	34	BD	150	2004		0	0	0	0	0	0	0	0	0	0
2,606,303	497,012	76137	G-068060	110	1000	14	8	35	AB	176	1982		0	0	0	0	0	0	38	38	22	27
2,611,474	495,720	62244	G-054654	200	800	14	8	36	-	135	1976		0	0	0	0	0	68	68	68	93	40
2,608,701	496,990	113191	G-096587	0	460	14	8	36	BB	115	1988		0	0	0	0	0	0	0	0	0	0
2,639,785	523,856	54444	G-047016	40	500	14	9	1	BC	43	1975		0	0	0	0	14	14	14	14	14	14
2,639,785	523,856	54445	G-047016	40	500	14	9	1	BC	42	1977		0	0	0	0	0	0	0	0	0	0
2,635,263	521,766	122511	G-105753	240	650	14	9	2	CO	160	2000		0	0	0	0	0	0	0	0	0	82
2,629,833	524,121	95916	G-084916	140	850	14	9	3	BD	230	1995		0	0	0	0	0	0	0	0	48	48
2,633,280	521,723	66668	G-058958	160	550	14	9	3	DA	195	1977		0	0	0	0	0	55	55	55	55	55
2,627,189	524,061	176541	G-140041	160	750	14	9	4	AA	220	1996		0	0	0	0	0	0	0	0	0	55
2,625,241	523,320	73575	G-065584	160	900	14	9	4	BD	202	1981		0	0	0	0	0	0	55	55	55	55
2,627,304	521,422	113075	G-096904	130	800	14	9	4	DO	235	1996		0	0	0	0	0	0	0	0	0	45
2,621,508	523,814	78560	G-070398	160	900	14	9	5	AB	224	1986		0	0	0	0	0	0	0	55	55	55
2,618,627	523,016	60637	G-053078	130	900	14	9	5	BC	200	1976		0	0	0	0	0	45	0	0	0	0
2,619,945	523,080	75350	G-067290	65	1000	14	9	5	BD	220	1981		0	0	0	0	0	0	22	22	22	22
2,619,388	521,052	175462	G-140863	80	800	14	9	5	CD	200	2006		0	0	0	0	0	0	0	0	0	0
2,614,063	522,186	55886	G-048425A	220	1200	14	9	6	BC	124	1975		0	0	0	0	75	75	75	75	75	75
2,614,022	523,423	158572	G-048425E	160	1000	14	9	6	BC	275	2004		0	0	0	0	0	0	0	0	0	0
2,614,205	520,797	170711	G-138821	100	1000	14	9	6	CA	280	2006		0	0	0	0	0	0	0	0	0	0
2,616,732	520,942	64848	G-057184	140	800	14	9	6	DO	104	1977		0	0	0	0	0	48	48	48	48	48
2,616,354	518,252	81030	G-072842	60	900	14	9	7	AC	274	1990	07/2003	0	0	0	0	0	0	0	21	21	21
2,616,353	518,282	150951	G-072842	60	900	14	9	7	AC	270	2003		0	0	0	0	0	0	0	0	0	0
2,614,744	517,724	49613	G-042325	200	1100	14	9	7	BC	170	1974		0	0	0	0	68	68	55	55	55	55
2,613,567	517,458	49612	G-042325	160	900	14	9	7	BC	195	1981		0	0	0	0	0	0	0	0	0	0
2,614,308	515,515	73675	G-065684	170	1000	14	9	7	CO	150	1981		0	0	0	0	0	0	58	58	58	58
2,633,077	519,051	61539	G-053963	70	900	14	9	10	AA	225	1976		0	0	0	0	0	24	24	24	24	24
2,633,386	519,681	68020	G-060250	5	100	14	9	10	AA	108	1977		0	0	0	0	0	2	2	2	2	2
2,629,693	516,172	167118	G-133298	0	0	14	9	10	CD	174	2004		0	0	0	0	0	0	0	0	0	0
2,629,693	516,171	167120	G-133371	80	0	14	9	10	CD	178	2005		0	0	0	0	0	0	0	0	0	0
2,630,812	515,004	167115	G-135542	80	200	14	9	10	CD	175	2004		0	0	0	0	0	0	0	0	0	0
2,629,846	516,179	167117	G-135543	8	200	14	9	10	CD	199	2005		0	0	0	0	0	0	0	0	0	0
2,632,824	517,710	170351	G-139140	136	700	14	9	10	DB	210	2006		0	0	0	0	0	0	0	0	0	0
2,632,968	516,293	87040	G-078377	80	400	14	9	10	DD	161	1988		0	0	0	0	0	0	0	27	27	27
2,637,989	519,189	159820	G-130797	80	1100	14	9	11	AB	108	2004		0	0	0	0	0	0	0	0	0	0
2,634,769	518,457	130341	G-109287	40	400	14	9	11	BC	123	2000		0	0	0	0	0	0	0	0	0	14
2,635,492	516,516	170362	G-136000	68	700	14	9	11	CB	130	2005		0	0	0	0	0	0	0	0	0	0
2,641,391	515,996	55286	G-047830	120	900	14	9	12	CD	65	1975		0	0	0	0	41	41	41	41	41	41
2,644,045	514,693	74550	G-066531	115	600	14	9	13	AA	80	1981		0	0	0	0	0	0	39	39	39	39

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Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,642,763	514,727	60991	G-053428	160	600	14	9	13	AB	57	1976		0	0	0	0	0	55	0	0	0	41
2,618,437	506,220	76467	G-068383	80	850	14	9	14	BC	153	1982		0	0	0	0	0	0	27	27	0	0
2,635,080	511,738	169010	G-136617	100	1000	14	9	14	CB	175	2005		0	0	0	0	0	0	0	0	0	0
2,633,043	512,445	172606	G-137529	140	800	14	9	15	AD	?	1984		0	0	0	0	0	0	48	48	48	48
2,631,126	514,814	170356	G-136517	80	200	14	9	15	BA	159	2005		0	0	0	0	0	0	0	0	0	0
2,630,249	512,188	72399	G-064450	160	800	14	9	15	CB	162	1980	03/2005	0	0	0	0	0	55	55	55	55	55
2,630,320	512,147	146189	G-133366	110	800	14	9	15	CB	164	2002		0	0	0	0	0	0	0	0	0	0
2,630,380	510,943	55757	G-048297	160	750	14	9	15	CO	147	1975	02/1996	0	0	0	0	55	0	0	0	0	0
2,633,108	511,057	137609	G-114521	133	900	14	9	15	DD	166	2002		0	0	0	0	0	0	0	0	0	0
2,627,701	513,550	157447	G-127133	160	900	14	9	16	AA	150	2004		0	0	0	0	0	0	0	0	0	0
2,627,634	513,473	69931	G-062094	130	800	14	9	16	AO	193	1979		0	0	0	0	0	45	45	45	45	45
2,625,090	510,731	169848	G-136423	135	1000	14	9	16	CO	180	2004		0	0	0	0	0	0	0	0	0	0
2,619,817	510,501	40779	G-033748	320	350	14	9	17	CO	186	1964	01/1995	0	0	110	110	110	110	110	110	0	0
2,615,808	510,842	43334	G-036211	150	800	14	9	18	CA	192	1970		0	0	0	51	51	51	51	55	63	0
2,614,696	511,215	99912	G-087929	150	720	14	9	18	CA	111	1996		0	0	0	0	0	0	0	0	0	51
2,613,352	510,409	113196	G-096588	200	460	14	9	18	CB	117	1977		0	0	0	0	0	68	68	68	0	0
2,615,974	510,694	43333	G-036211	300	900	14	9	18	DB	192	1985	05/2003	0	0	0	0	0	0	0	0	0	0
2,617,260	504,910	125877	G-105801	130	850	14	9	19	DC	175	2000		0	0	0	0	0	0	0	0	0	0
2,620,043	507,869	132304	G-054655	130	787	14	9	20	BA	160	1974		0	0	0	0	45	45	45	45	0	0
2,620,095	508,222	62245	G-054655	200	750	14	9	20	BA	165	2001		0	0	0	0	0	0	0	0	0	0
2,619,957	506,332	40781	G-033750	500	1100	14	9	20	CC	176	1965		0	0	171	171	171	55	55	55	55	55
2,622,698	505,266	125878	G-105802	0	740	14	9	20	DD	195	2000		0	0	0	0	0	0	0	0	0	0
2,625,321	506,092	40783	G-033752	400	750	14	9	21	-	155	1967		0	0	0	0	0	0	0	0	0	0
2,626,694	506,075	40785	G-033754	200	400	14	9	21	-	169	1967		0	0	0	68	68	68	55	55	0	0
2,625,214	507,985	160959	G-129063	320	1000	14	9	21	BC	170	2004		0	0	0	0	0	0	0	0	0	0
2,625,209	508,095	94030	G-083866	0	800	14	9	21	BO	130	1976		0	0	0	0	0	0	0	0	0	0
2,624,963	505,301	40786	G-033755	300	400	14	9	21	CC	118	1970		0	0	0	0	0	0	0	0	0	0
2,628,012	504,591	51659	G-044312	75	1000	14	9	21	DC	165	1973		0	0	0	0	26	26	26	26	0	0
2,632,495	509,007	56923	G-049439	240	950	14	9	22	AB	130	1976		0	0	0	0	0	82	82	82	82	82
2,614,733	511,212	77324	G-069184	80	900	14	9	22	CB	162	1983		0	0	0	0	0	0	27	27	0	40
2,629,999	504,936	53886	G-046472	80	800	14	9	22	CC	160	1975		0	0	0	0	27	27	27	27	27	27
2,635,152	507,801	64375	G-056729	120	900	14	9	23	BC	136	1977		0	0	0	0	0	41	41	41	41	41
2,635,914	505,838	82694	G-074349	120	1000	14	9	23	CD	82	1991		0	0	0	0	0	0	0	0	41	41
2,638,970	507,254	138836	G-115161	28	250	14	9	23	DA	90	2002		0	0	0	0	0	0	0	0	0	0
2,638,558	506,131	138837	G-115162	14	250	14	9	23	DA	100	2002		0	0	0	0	0	0	0	0	0	0
2,639,972	502,152	174192	G-138924	205	1200	14	9	26	AD	95	2006		0	0	0	0	0	0	0	0	0	0
2,636,659	503,244	20348	G-014822	280	1000	14	9	26	BA	49	1958		0	96	96	43	43	43	43	43	43	43
2,635,341	503,188	20347	G-014821	280	1000	14	9	26	BB	47	1958		0	96	96	96	96	96	96	96	96	0
2,635,926	503,312	125873	G-105797	130	650	14	9	26	BB	47	2000		0	0	0	0	0	0	0	0	0	45

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,635,395	501,244	61193	G-053630	76	600	14	9	26	CB	96	1976		0	0	0	0	0	26	26	26	26	26
2,631,364	503,696	5922	G-002341	85	940	14	9	27	BA	?	1956		0	29	29	29	29	29	29	29	29	29
2,629,416	502,905	43211	G-036098	80	1000	14	9	27	BC	94	1972		0	0	0	0	27	27	27	27	27	27
2,630,733	501,665	34853	G-028138	160	1200	14	9	27	CB	92	1967		0	0	0	55	55	55	55	55	55	0
2,630,786	500,386	34854	G-028139	160	1200	14	9	27	CB	92	1967	05/1996	0	0	0	0	0	0	0	0	0	0
2,630,813	500,318	99112	G-087283	75	1200	14	9	27	CD	100	1996		0	0	0	0	0	0	0	0	0	26
2,627,623	503,066	43336	G-036213	75	800	14	9	28	AO	167	1971		0	0	0	0	26	26	26	26	0	0
2,625,333	502,770	113197	G-096589	100	800	14	9	28	BO	170	1973		0	0	0	0	34	34	34	34	0	0
2,613,776	499,678	40778	G-033747	500	1200	14	9	30	CB	132	1963		0	0	171	171	171	171	171	171	38	15
2,617,326	499,760	43332	G-036210	100	200	14	9	30	DC	114	1970	1991	0	0	0	34	34	0	0	0	0	0
2,618,137	499,804	43337	G-036214	200	400	14	9	30	DD	130	1971		0	0	0	0	68	68	68	68	0	0
2,621,640	497,763	169688	G-136422	24	250	14	9	32	BA	100	2005		0	0	0	0	0	0	0	0	0	0
2,621,624	497,756	175458	G-136422	24	300	14	9	32	BA	180	2006		0	0	0	0	0	0	0	0	0	0
2,631,136	497,962	13866	G-009205	80	900	14	9	34	BA	92	1956		0	27	27	27	27	27	27	27	27	27
2,630,238	498,344	59723	G-052170	60	500	14	9	34	BB	125	1976		0	0	0	0	0	21	21	21	21	21
2,638,335	499,295	165141	G-047358	100	1600	14	9	35	AB	70	1975	05/2006	0	0	0	0	34	34	34	34	34	34
2,638,305	499,294	54797	G-047358	100	1000	14	9	35	AB	78	2004		0	0	0	0	0	0	0	0	0	0
2,635,905	495,672	169694	G-136409	130	800	14	9	35	CB	115	2005		0	0	0	0	0	0	0	0	0	0
2,636,623	494,993	177104	G-136409	90	800	14	9	35	CD	120	2006		0	0	0	0	0	0	0	0	0	0
2,636,320	495,923	82696	G-074351	80	1000	14	9	35	DB	82	1991		0	0	0	0	0	0	0	0	27	27
2,642,073	499,403	106367	G-090924	28	200	14	9	36	BA	72	1996		0	0	0	0	0	0	0	0	0	10
2,643,279	496,832	138835	G-115160	16	250	14	9	36	DB	80	2002		0	0	0	0	0	0	0	0	0	0
2,643,002	495,044	138834	G-115159	16	250	14	9	36	DC	90	2002		0	0	0	0	0	0	0	0	0	0
2,663,364	523,573	63907	G-056280	132	800	14	10	3	DB	277	1977		0	0	0	0	0	45	45	45	45	45
2,656,633	525,900	72185	G-064243	101	600	14	10	4	BA	49	1980		0	0	0	0	0	35	35	35	35	35
2,653,492	525,227	128037	G-107321	110	1000	14	10	5	AA	64	2000		0	0	0	0	0	0	0	0	0	38
2,652,071	525,766	23049	G-017200	200	1100	14	10	5	AB	82	1956		0	68	68	68	68	68	68	68	68	0
2,650,982	524,440	72528	G-064572	70	600	14	10	5	BD	79	1980	10/2004	0	0	0	0	0	24	24	24	24	24
2,651,807	523,684	28696	G-022336	60	800	14	10	5	CA	83	1963		0	0	21	21	21	21	21	21	21	21
2,654,149	523,139	72669	G-064703	50	500	14	10	5	DA	60	1980		0	0	0	0	0	17	17	17	17	17
2,648,231	524,404	55409	G-047951	140	1250	14	10	6	AD	61	1975	10/2004	0	0	0	0	48	48	48	48	48	48
2,649,029	520,291	55408	G-047950	125	800	14	10	7	AA	60	1975		0	0	0	0	43	43	26	26	26	26
2,649,059	520,275	55407	G-047950	75	1250	14	10	7	AA	61	1982	10/2004	0	0	0	0	0	0	0	0	0	0
2,654,849	519,217	20787	G-015211	320	1200	14	10	8	AD	63	1957		0	110	110	110	110	110	110	110	110	110
2,650,991	519,741	72529	G-064573	160	800	14	10	8	BB	67	1980	10/2004	0	0	0	0	0	55	55	55	55	55
2,656,449	521,093	113269	G-096627	60	130	14	10	9	BA	60	1998		0	0	0	0	0	0	0	0	0	21
2,667,855	511,905	65568	G-057881	100	200	14	10	14	CD	255	1977		0	0	0	0	0	34	34	34	34	34
2,655,955	511,295	26786	G-020550	0	800	14	10	16	CC	53	1959		0	0	0	0	0	0	0	0	0	0
2,659,538	513,493	16269	G-011280	70	1000	14	10	16	DA	77	1957		0	24	24	24	24	24	24	24	24	24

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,659,904	511,554	64149	G-056514	40	750	14	10	16	DD	54	1977		0	0	0	0	0	14	14	14	14	14
2,654,509	514,556	20395	G-014865	126	1000	14	10	17	-	60	1956		0	43	43	36	36	36	36	36	36	36
2,654,612	511,906	20396	G-014866	105	1000	14	10	17	DA	42	1956		0	36	36	0	0	0	0	0	0	0
2,646,782	510,920	58520	G-050995	150	800	14	10	18	CD	80	1976		0	0	0	0	0	51	51	51	51	51
2,649,497	508,174	121641	G-102991	38	1250	14	10	19	AD	80	1977	05/2001	0	0	0	0	0	13	13	13	13	13
2,649,553	506,909	121642	G-102992	38	1250	14	10	19	DA	80	1977	05/2001	0	0	0	0	0	13	13	13	13	13
2,649,602	505,811	121643	G-102993	38	1250	14	10	19	DD	80	1977	05/2001	0	0	0	0	0	13	13	13	13	13
2,660,041	508,907	64148	G-056513	30	750	14	10	21	AD	61	1977		0	0	0	0	0	10	10	10	10	10
2,656,877	509,493	119284	G-101198	100	700	14	10	21	BA	50	1999		0	0	0	0	0	0	0	0	0	34
2,656,019	509,988	26787	G-020551	40	600	14	10	21	BB	47	1959		0	14	14	14	14	14	14	14	14	14
2,656,090	508,671	26788	G-020552	40	600	14	10	21	BC	48	1959		0	14	14	14	14	14	14	14	14	14
2,659,433	507,749	19586	G-014161	225	1000	14	10	21	DB	90	1957		0	77	77	77	77	77	77	0	0	0
2,659,468	506,910	81487	G-073294	80	800	14	10	21	DB	64	1990		0	0	0	0	0	0	0	27	27	27
2,666,747	505,055	112089	G-097797	0	200	14	10	26	BB	240	1996		0	0	0	0	0	0	0	0	0	0
2,661,697	501,034	3650	G-000377	186	1000	14	10	27	CC	?	1955		64	64	64	64	64	64	64	64	64	64
2,658,404	501,520	49065	G-041786	140	1250	14	10	28	-	65	1974		0	0	0	0	48	48	48	48	48	48
2,658,523	504,371	81662	G-073449	160	800	14	10	28	AB	50	1991		0	0	0	0	0	0	0	0	55	55
2,659,611	504,227	4330	G-000960	173	0	14	10	28	AO	?	1956		0	59	59	59	59	59	59	59	0	0
2,657,610	504,779	8018	G-004183	240	1500	14	10	28	BA	50	1957		0	82	82	82	82	0	0	0	0	0
2,657,610	504,779	57652	G-050151	140	800	14	10	28	BA	51	1975		0	0	0	0	0	48	48	48	0	0
2,657,101	504,927	90371	G-081565	125	1000	14	10	28	BB	50	1994		0	0	0	0	0	0	0	0	43	43
2,645,796	502,965	58958	G-051424	120	490	14	10	30	BC	78	1976		0	0	0	0	0	41	41	41	41	41
2,646,554	503,655	136953	G-113392	0	400	14	10	30	BO	?			0	0	0	0	0	0	0	0	0	0
2,648,203	495,779	27484	G-021194	160	800	14	10	31	-	75	1936		55	55	55	55	55	55	55	55	55	55
2,646,668	498,252	169693	G-135895	65	800	14	10	31	BC	114	2005		0	0	0	0	0	0	0	0	0	0
2,647,432	497,026	27483	G-021194	40	500	14	10	31	CA	60	1970		0	0	0	14	14	14	14	14	14	14
2,661,046	500,312	13661	G-009033	160	1500	14	10	33	AA	70	1957		0	55	55	55	55	55	55	55	55	55
2,659,212	498,273	4331	G-000961	154	0	14	10	33	AC	?	1956		0	0	0	0	0	0	0	0	0	0
2,657,971	496,890	61220	G-053656	160	900	14	10	33	CA	51	1976		0	0	0	0	0	55	55	55	55	55
2,658,047	495,572	69456	G-061620	40	400	14	10	33	CD	55	1979		0	0	0	0	0	36	36	36	36	36
2,660,606	497,022	59969	G-052414	160	850	14	10	33	DA	81	1976		0	0	0	0	0	55	55	55	55	38
2,663,146	498,453	8019	G-004184	240	800	14	10	34	BD	70	1957		0	82	82	82	82	82	82	82	82	82
2,661,238	497,690	110243	G-094585	80	900	14	10	34	CB	51	1997		0	0	0	0	0	0	0	0	0	27
2,608,603	531,249	26529	G-020313	200	1200	15	8	25	CA	128	1957		0	68	68	68	68	68	68	68	68	68
2,611,047	530,993	44794	G-037636	180	1100	15	8	25	DC	122	1972		0	0	0	0	62	62	62	62	62	62
2,611,211	530,658	176565	G-140862	3	75	15	8	25	DD	95	2006		0	0	0	0	0	0	0	0	0	0
2,603,347	531,039	53968	G-046552	115	700	15	8	26	CD	139	1975		0	0	0	0	39	39	39	39	39	39
2,604,941	531,839	59224	G-051686	40	800	15	8	26	DB	136	1976		0	0	0	0	0	14	14	14	14	14
2,605,010	530,522	69919	G-062082	77	700	15	8	26	DC	129	1979		0	0	0	0	0	26	26	26	26	26

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Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,597,603	530,967	84869	G-076374	132	650	15	8	27	CC	126	1992		0	0	0	0	0	0	0	0	45	45
2,592,368	530,855	109399	G-094011	0	800	15	8	28	CC	145	1996		0	0	0	0	0	0	0	0	0	0
2,589,201	528,683	59302	G-051762	160	750	15	8	32	AB	115	1975		0	0	0	0	55	55	55	55	55	55
2,591,407	524,632	113193	G-097207	35	350	15	8	32	DD	120	1998		0	0	0	0	0	0	0	0	0	12
2,595,874	527,567	70226	G-062375	60	650	15	8	33	AD	131	1979		0	0	0	0	0	21	21	21	21	21
2,596,171	527,476	70227	G-062375	60	750	15	8	33	AD	125	1990		0	0	0	0	0	0	0	21	21	21
2,592,558	528,251	80286	G-072123	230	850	15	8	33	BA	153	1989		0	0	0	0	0	0	0	79	79	79
2,593,326	526,170	74254	G-066246	160	800	15	8	33	CA	131	1981		0	0	0	0	0	0	55	55	55	55
2,594,338	525,422	44886	G-037726	160	500	15	8	33	DC	145	1972		0	0	0	0	55	0	0	0	0	0
2,596,053	524,935	54518	G-047089	153	900	15	8	33	DD	130	1975		0	0	0	0	0	52	52	52	52	52
2,600,716	524,444	29812	G-023385	80	600	15	8	34	-	125	1964		0	0	27	27	27	27	27	27	27	27
2,598,646	525,682	50266	G-042956	80	400	15	8	34	-	125	1974		0	0	0	0	27	27	27	27	27	27
2,599,167	528,473	82087	G-073751	130	700	15	8	34	AB	130	1991		0	0	0	0	0	0	0	0	45	45
2,599,297	528,293	169692	G-073751	130	700	15	8	34	AC	135	2005		0	0	0	0	0	0	0	0	0	0
2,598,118	528,432	50092	G-042792	160	600	15	8	34	BA	135	1974		0	0	0	0	55	55	55	55	55	55
2,597,430	528,396	44840	G-037681	208	450	15	8	34	BB	120	1972		0	0	0	0	0	0	0	0	0	0
2,597,927	528,136	157787	G-127250	110	550	15	8	34	BD	140	2004		0	0	0	0	0	0	0	0	0	0
2,598,696	525,024	73985	G-065987	155	700	15	8	34	CD	120	1981		0	0	0	0	0	0	53	53	53	53
2,603,064	528,589	79525	G-071363	130	700	15	8	35	BB	135	1989		0	0	0	0	0	0	0	45	45	45
2,611,836	528,695	42382	G-035300	68	900	15	8	36	-	115	1971		0	0	0	0	23	23	23	23	23	23
2,610,568	529,331	95399	G-084655	39	400	15	8	36	AB	138	1995		0	0	0	0	0	0	0	0	13	13
2,610,545	528,001	85302	G-076735	76	750	15	8	36	AC	117	1985		0	0	0	0	0	0	26	26	26	26
2,608,866	529,287	44836	G-037677	160	1000	15	8	36	BA	130	1972		0	0	0	0	55	0	0	0	0	0
2,607,910	527,879	68196	G-060417	53	800	15	8	36	BC	123	1978		0	0	0	0	0	18	18	18	18	18
2,608,891	525,971	121253	G-109448	150	750	15	8	36	CA	121	1999		0	0	0	0	0	0	0	0	0	51
2,611,950	526,043	59472	G-051927	151	850	15	8	36	DA	113	1976		0	0	0	0	0	52	52	52	52	52
2,611,211	527,288	95055	G-084524	68	0	15	8	36	DB	113	1995		0	0	0	0	0	0	0	0	0	0
2,627,210	555,126	40498	G-033471	120	800	15	9	3	BC	105	1970		0	0	0	41	41	41	41	41	41	41
2,621,261	554,859	111986	G-095489	118	500	15	9	5	AD	204	1996		0	0	0	0	0	0	0	0	0	40
2,621,284	553,501	28893	G-022518	80	600	15	9	5	DA	179	1963	04/2005	0	0	27	27	27	27	27	27	27	27
2,620,610	554,100	153850	G-022518	120	500	15	9	5	DA	182	2004	04/2005	0	0	0	0	0	0	0	0	0	0
2,620,641	552,821	166021	G-022518	130	650	15	9	5	DA	360	2005		0	0	0	0	0	0	0	0	0	0
2,612,007	554,466	58708	G-051178	420	900	15	9	6	BC	253	1976		0	0	0	0	0	144	144	144	144	144
2,626,077	547,760	66537	G-058833	130	900	15	9	9	DO	315	1977		0	0	0	0	0	45	45	45	45	45
2,641,254	551,669	63790	G-056172	100	800	15	9	12	AB	58	1977		0	0	0	0	0	34	34	34	34	34
2,626,818	545,847	59221	G-051683	160	900	15	9	16	AA	187	1976		0	0	0	0	0	55	55	55	55	55
2,617,658	545,433	56400	G-048932	160	800	15	9	17	BB	353	1976		0	0	0	0	0	0	0	0	0	0
2,618,350	544,790	55121	G-047668	120	250	15	9	17	BO	125	1975		0	0	0	0	41	41	41	41	41	41
2,613,173	544,570	71895	G-063973	160	600	15	9	18	BD	216	1980		0	0	0	0	0	55	55	55	55	55

Table 2-12
Historical Irrigation Wells and Estimated Pumping Rates, 1955 to 2000
Former Nebraska Ordnance Plant, Mead, Nebraska

Easting (ft NAD 83)	Northing (ft NAD 83)	DNR Well ID	DNR Regist-ration Code	Acres on Regis-tration	Regist-ration Pumping Rate (gpm)	Town-ship	Range	Sec-tion	Sub-Section	Total Depth (ft)	Comp-leted Year	Aband-onment Date	Simulated Steady State (Avg. Annual) Pumping Rate (gpm)									
													1955	1960	1965	1970	1975	1980	1985	1990	1995	2000
2,612,436	542,563	59789	G-052237	80	650	15	9	18	CB	187	1976		0	0	0	0	0	27	27	27	27	55
2,612,424	541,982	111972	G-099221	160	800	15	9	18	CB	325	1998		0	0	0	0	0	0	0	0	0	55
2,618,047	540,330	102750	G-092480	120	700	15	9	20	BB	324	1997		0	0	0	0	0	0	0	0	0	41
2,623,523	539,624	111979	G-096299	125	800	15	9	21	BC	350	1998		0	0	0	0	0	0	0	0	0	43
2,632,853	539,392	169689	G-136373	120	200	15	9	22	AD	239	2005		0	0	0	0	0	0	0	0	0	0
2,629,190	537,368	57385	G-049891	130	900	15	9	22	CO	279	1976		0	0	0	0	0	45	45	45	45	45
2,635,846	537,458	167934	G-135560	200	800	15	9	23	DC	209	2005		0	0	0	0	0	0	0	0	0	0
2,640,436	538,406	68850	G-061031	113	750	15	9	24	CA	48	1978		0	0	0	0	0	39	39	39	39	39
2,613,242	535,055	142572	G-069761	200	650	15	9	30	BB	320	1984	10/2002	0	0	0	0	0	0	68	68	68	68
2,613,222	535,054	77920	G-069761	160	850	15	9	30	BB	308	2002		0	0	0	0	0	0	0	0	0	0
2,612,994	530,714	74376	G-066364	160	800	15	9	30	CC	286	1981		0	0	0	0	0	0	55	55	55	55
2,613,262	525,423	66030	G-058325	40	1000	15	9	31	CC	161	1977		0	0	0	0	0	14	14	14	14	14
2,620,398	527,781	96791	G-085522	240	1200	15	9	32	BD	210	1995		0	0	0	0	0	0	0	0	82	82
2,618,516	525,630	79331	G-071170	110	700	15	9	32	CC	197	1988		0	0	0	0	0	0	0	38	38	38
2,618,510	511,668	77350	G-069208	235	1000	15	9	33	CD	192	1983		0	0	0	0	0	0	80	80	0	0
2,629,488	526,885	106078	G-090720	135	800	15	9	34	CB	263	1996		0	0	0	0	0	0	0	0	0	46
2,645,496	529,372	124031	G-104278	139	0	15	10	31	-	61	2000		0	0	0	0	0	0	0	0	0	48
2,644,241	530,762	130103	G-108647	85	500	15	10	31	BB	60	2001		0	0	0	0	0	0	0	0	0	0
2,644,633	529,305	64499	G-056849	95	800	15	10	31	BC	60	1977		0	0	0	0	0	33	33	33	33	33
2,646,702	527,448	57838	G-050332	80	800	15	10	31	CA	65	1976	10/2004	0	0	0	0	0	27	27	27	27	27
2,647,386	526,802	74099	G-066095	80	600	15	10	31	DC	43	1981	1989	0	0	0	0	0	0	27	0	0	0
2,653,212	530,397	173328	G-137912	78	800	15	10	32	AA	120	1990		0	0	0	0	0	0	0	27	27	27
2,650,680	527,623	23048	G-017199	160	1100	15	10	32	CO	81	1956		0	55	55	55	55	55	55	55	55	55
2,652,217	527,684	42969	G-035862	130	1250	15	10	32	DC	78	1971		0	0	0	0	45	45	45	45	45	45
2,657,817	529,948	65752	G-058058	60	1000	15	10	33	AC	46	1977		0	0	0	0	0	21	21	21	21	21
2,656,541	528,563	73905	G-065908	60	600	15	10	33	CA	49	1981		0	0	0	0	0	0	21	21	21	21
2,655,264	527,177	58401	G-050879	75	800	15	10	33	CC	59	1976		0	0	0	0	0	26	26	26	26	26
2,657,858	528,629	65751	G-058057	40	700	15	10	33	DB	46	1977		0	0	0	0	0	14	14	14	14	14
2,661,214	526,813	23050	G-017201	220	1100	15	10	34	-	85	1956		0	75	75	75	75	75	75	75	75	75
2,660,584	530,339	58399	G-050878	20	800	15	10	34	BC	43	1976		0	0	0	0	0	7	7	7	7	7
2,660,932	530,075	58400	G-050878	20	900	15	10	34	BC	50	1989		0	0	0	0	0	0	0	7	7	7
2,661,154	528,096	27800	G-021492	134	650	15	10	34	CC	62	1961		0	0	46	46	46	46	46	46	46	46

Table 2-13
FNOP Containment Well Extraction Rates (gpm)
Former Nebraska Ordnance Plant, Mead, Nebraska

Date	EW-1	EW-2	EW-3	EW-4	EW-5	EW-6	EW-7	EW-8	EW-9	EW-10	EW-11	EW-12	EW-13	Total (1-10)
Feb-02	185	175	236	132	252	306	331	316	268	428	0	0	0	2,629
Mar-02	181	175	227	132	251	305	329	322	263	420	0	0	0	2,605
Apr-02	180	175	228	124	250	307	328	324	261	419	0	0	0	2,596
May-02	179	175	220	119	251	310	328	319	250	418	0	0	0	2,569
Jun-02	177	174	220	120	249	309	328	320	250	414	0	0	0	2,561
Jul-02	175	176	220	123	250	311	330	321	231	410	0	0	0	2,547
Aug-02	174	175	221	120	250	309	330	322	231	409	0	0	0	2,541
Nov-02	171	175	220	115	250	314	320	323	226	376	0	0	0	2,490
Feb-03	168	175	220	110	249	294	315	319	221	379	0	0	0	2,450
May-03	164	174	219	109	250	290	314	312	216	380	0	0	0	2,428
Aug-03	160	173	218	105	251	292	299	310	215	392	0	0	0	2,415
Nov-03	154	169	221	107	249	280	300	312	215	396	0	0	0	2,403
Mar-04	148	168	220	117	245	264	299	310	210	375	0	0	0	2,356
Apr-04	148	168	219	116	244	253	280	310	185	374	0	0	0	2,297
Aug-04	198	150	220	122	250	276	298	335	194	401	0	0	0	2,444
Oct-04	200	150	220	119	248	260	302	336	185	400	0	0	0	2,420
Jan-05	197	151	220	115	249	240	274	338	180	406	0	0	0	2,370
May-05	200	151	219	110	252	233	264	333	180	409	0	0	0	2,351
Aug-05	197	150	219	105	251	276	305	305	178	401	0	0	0	2,387
Oct-05	187	150	220	104	249	276	304	304	171	396	0	0	0	2,361
Jan-06	176	149	218	104	235	255	306	304	164	350	0	0	0	2,261
Feb-06	171	149	218	104	226	255	301	304	158	343	0	0	0	2,229
Mar-06	167	149	217	104	225	261	306	305	151	306	0	0	0	2,191
Apr-06	163	148	216	103	243	257	311	307	151	291	0	325	0	2,190
May-06	158	148	216	102	243	258	308	305	150	323	0	325	0	2,211
Jun-06	191	148	216	112	229	276	303	298	149	358	0	325	0	2,279
Jul-06	231	147	215	115	218	280	303	295	148	357	0	325	0	2,309
Aug-06	231	147	217	116	213	274	305	296	145	341	0	325	0	2,286
Sep-06	232	148	216	115	205	270	307	296	142	305	0	325	0	2,236
Oct-06	232	147	215	114	205	270	307	297	141	304	0	325	0	2,232
Nov-06	215	150	232	112	195	258	291	296	139	289	0	325	0	2,177
Dec-06	204	151	266	108	168	267	302	296	138	276	0	325	0	2,177
Jan-07	209	150	247	106	172	259	292	295	137	272	0	325	0	2,139

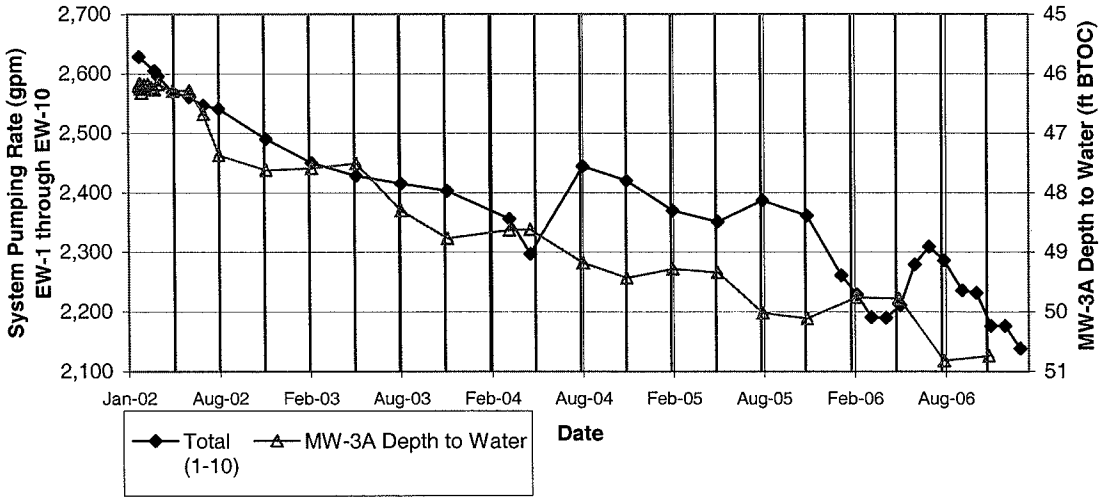


Table 2-14
MUD Pumping Test Results
Former Nebraska Ordnance Plant, Mead, Nebraska

Pumping Well	48-Hour Constant Rate Test Transmissivity		48-Hour Constant Rate Test Hydraulic Conductivity		Recovery Test Transmissivity	Recovery Test Hydraulic Conductivity
	Minimum (ft^2/day)	Maximum (ft^2/day)	Minimum (ft/day)	Maximum (ft/day)	(ft^2/day)	(ft/day)
PW04-04	76,700	91,000	890	1,050	79,900	920
PW04-05	23,600	52,600	270	590	31,100	350
PW04-06	39,600	93,900	430	1,010	50,800	550
PW04-07	37,800	48,700	410	530	-	-
PW04-08	38,900	80,400	420	870	41,000	440
PW04-09	19,400	31,000	230	370	12,300	150
PW04-10	6,200	15,800	70	170	4,700	50
PW04-11	31,400	41,200	410	540	4,400	60
PW04-12	40,900	145,000(?)	420	1,480(?)	111,000	1,130
PW04-13	58,300(?)	103,000(?)	640(?)	1,140(?)	-	-
PW04-14	6,000	7,300	70	80	6,900	80
PW04-15	4,900	27,000	50	300	3,700	40
PW04-16	4,700(?)	11,200(?)	130(?)	310(?)	4,300	120
PW04-38	3,900	7,900	40	80	2,400	30
PW04-39	29,900(?)	144,000(?)	330(?)	1,560(?)	15,400	170
PW04-40	3,400	6,500	40	70	1,800	20
PW04-41	65,200	446,000(?)	720	4,890(?)	48,400	530
PW04-42	4,400	15,200	50	160	2,800	30
PW04-43	29,900	56,000	320	600	35,600	380
PW04-45	3,500(?)	8,600(?)	40(?)	90(?)	3,100	30
PW04-46	17,400	59,400	200	680	42,600	490
PW04-47	42,000	63,800	480	730	42,000	480
PW04-48	31,400	41,200	350	460	4,400	50
PW04-50	38,000	129,000(?)	410	1,400(?)	39,800	430
PW04-51	25,600	70,500	280	770	111,000(?)	1,200(?)
PW04-52	51,700	102,000	560	1,100	34,100	370
PW04-53	34,000	119,000	380	1,330	9,600(?)	110(?)
PW04-54	29,100	60,500	330	690	43,000	490
PW04-55	43,300	149,000(?)	460	1,580(?)	6,500(?)	70(?)
Average	**29,800**	**51,900**	**332**	**580**	**27,700**	**308**

Notes:
1. (?) designates result regarded as questionable by Olsen Associates (HDR, 2005).
These results are not included in averages.
2. Hydraulic conductivity value based on saturated thickness estimated from
Map of Bedrock Surface (Figure 2-2) and March 29, 2006 Potentiometric Surface (Figure 2-4).

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
GP-11	2609128.62	501626.76	65	1097.90	24	URS APRIL 02
GP-23	2607751.12	504328.03	70	1100.04	ND	URS APRIL 02
GP-36	2606115.85	508407.31	70	1107.51	ND	URS APRIL 02
GP-37	2608712.06	495517.83	65	1092.31	ND	URS MARCH 03
GP-38	2609206.03	495527.71	51	1102.55	ND	URS MARCH 03
GP-39	2610319.40	495566.35	50	1104.07	ND	URS MARCH 03
GP-40	2610876.37	495589.14	62	1103.41	ND	URS MARCH 03
GP-41	2611433.40	495608.37	59	1101.55	ND	URS MARCH 03
GP-115	2610824.29	492224.62	25	1079.45	ND	URS JAN 06
GP-117	2611209.46	492239.94	25	1078.19	ND	URS JAN 06
GP-118	2610808.42	492036.60	25	1079.48	ND	URS JAN 06
GP-123	2611010.12	491841.51	25	1079.95	ND	URS JAN 06
GP-128	2610777.19	491577.18	25	1081.17	ND	URS JAN 06
GP-129	2611241.73	491591.47	25	1078.95	ND	URS JAN 06
GP-T01-01	2632681.21	496434.55	25	1061.59	1.1	URS OCT/NOV 05
GP-T01-02	2633251.01	496458.10	20	1056.90	ND	URS OCT/NOV 05
GP-T01-03	2633771.81	496481.16	19	1057.06	ND	URS OCT/NOV 05
GP-T01-04	2634313.24	496504.50	20	1056.40	ND	URS OCT/NOV 05
GP-T01-05	2634849.94	496524.80	20	1057.13	ND	URS OCT/NOV 05
GP-T01-06	2635320.02	497568.18	20	1057.30	ND	URS OCT/NOV 05
GP-T01-07	2635864.11	497577.28	20	1058.42	ND	URS OCT/NOV 05
GP-T01-08	2636625.08	497586.99	20	1059.49	ND	URS OCT/NOV 05
GP-T01-09	2637577.58	497601.16	20	1059.27	ND	URS OCT/NOV 05
GP-T01-10	2638535.39	497630.83	19	1059.55	ND	URS OCT/NOV 05
GP-T01-11	2632960.20	496450.10	25	1054.98	ND	URS OCT/NOV 05
GP-T01-12	2634586.09	496513.29	20	1056.22	ND	URS OCT/NOV 05
GP-T01-13	2634984.72	497565.75	20	1056.61	ND	URS OCT/NOV 05
GP-T01-14	2635569.64	497573.68	20	1057.29	ND	URS OCT/NOV 05
GP-T01-15	2637096.19	497593.80	20	1058.09	ND	URS OCT/NOV 05
GP-T01-16	2638101.76	497617.88	19	1059.72	ND	URS OCT/NOV 05
GP-T02-01	2629114.49	500712.78	60	1080.17	ND	URS OCT/NOV 05
GP-T02-02	2629350.26	501091.42	60	1077.68	ND	URS OCT/NOV 05
GP-T02-03	2629429.55	501269.68	60	1077.61	ND	URS OCT/NOV 05
GP-T02-04	2630828.86	503085.51	60	1078.13	2.2	URS OCT/NOV 05
GP-T02-05	2631124.11	503944.37	60	1079.44	1.5	URS OCT/NOV 05
GP-T02-06	2629369.61	501941.94	65	1083.20	ND	URS MARCH 06
GP-T02-07	2629364.01	502468.62	60	1084.25	ND	URS MARCH 06
GP-T02-08	2629339.51	502902.68	60	1081.29	ND	URS MARCH 06
GP-T02-09	2629316.81	503325.08	60	1081.86	ND	URS MARCH 06
GP-T03-01	2635350.27	503934.07	24	1063.35	ND	URS OCT/NOV 05
GP-T03-02	2635371.58	503380.67	24	1065.27	ND	URS OCT/NOV 05
GP-T03-03	2635389.80	502847.31	24	1063.60	ND	URS OCT/NOV 05
GP-T03-04	2635410.29	502342.47	24	1061.38	ND	URS OCT/NOV 05
GP-T03-05	2635427.04	501900.87	24	1059.91	ND	URS OCT/NOV 05
GP-T03-06	2636186.08	501444.59	24	1058.38	ND	URS OCT/NOV 05
GP-T03-07	2636206.56	500902.04	24	1056.81	ND	URS OCT/NOV 05
GP-T03-08	2636224.45	500406.06	22	1058.20	ND	URS OCT/NOV 05
GP-T03-09	2636242.95	499929.48	22	1057.80	ND	URS OCT/NOV 05
GP-T03-10	2635339.17	504171.73	24	1062.76	ND	URS OCT/NOV 05
GP-T03-11	2635329.91	504384.96	25	1062.50	ND	URS OCT/NOV 05

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
GP-T04-01	2634160.36	503856.96	18	1073.62	ND	URS OCT/NOV 05
GP-T04-02	2634160.66	503350.42	24	1064.90	ND	URS OCT/NOV 05
GP-T04-03	2634131.53	502789.96	24	1062.20	ND	URS OCT/NOV 05
GP-T04-04	2634077.45	502297.00	24	1061.26	2.4	URS OCT/NOV 05
GP-T04-07	2634027.01	499801.15	21	1058.25	ND	URS OCT/NOV 05
GP-T04-08	2634160.55	504075.48	18	1074.06	ND	URS OCT/NOV 05
GP-T04-09	2634163.29	504301.79	19	1073.82	ND	URS OCT/NOV 05
GP-T05-01	2632242.02	499455.61	65	1067.59	ND	URS OCT/NOV 05
GP-T05-02	2632696.60	499415.13	26	1070.48	0.4	URS OCT/NOV 05
GP-T05-03	2633253.16	499455.75	20	1062.33	ND	URS OCT/NOV 05
GP-T05-04	2633738.60	499466.33	20	1058.85	1.4	URS OCT/NOV 05
GP-T05-05	2634196.41	499486.38	16	1063.05	ND	URS OCT/NOV 05
GP-T05-06	2634686.98	499522.54	14	1064.76	ND	URS OCT/NOV 05
GP-T05-07	2636339.38	499423.04	19	1059.45	ND	URS OCT/NOV 05
GP-T05-08	2637208.11	499445.72	18	1062.18	ND	URS OCT/NOV 05
GP-T05-09	2633965.53	499473.35	19	1059.68	ND	URS OCT/NOV 05
GP-T05-10	2634430.02	499508.11	19	1059.63	ND	URS OCT/NOV 05
GP-T05-11	2636777.05	499433.48	19	1061.64	ND	URS OCT/NOV 05
GP-T05-12	2632491.57	499449.68	44	1069.52	ND	URS OCT/NOV 05
GP-T06-01	2629670.98	495178.97	64	1079.60	ND	URS OCT/NOV 05
GP-T06-02	2629404.85	494351.18	55	1071.09	0.32	URS OCT/NOV 05
GP-T06-03	2629085.50	493685.38	60	1069.32	ND	URS OCT/NOV 05
GP-T06-05	2630102.69	493676.69	60	1073.29	0.75	URS OCT/NOV 05
GP-T07-01	2627838.52	496049.29	60	1083.12	ND	URS OCT/NOV 05
GP-T07-02	2627513.19	495313.11	60	1084.03	ND	URS OCT/NOV 05
GP-T07-03	2627301.43	494826.94	55	1079.55	ND	URS OCT/NOV 05
GP-T07-04	2627029.12	494193.44	60	1082.34	ND	URS OCT/NOV 05
GP-T08-01	2626866.04	498636.49	80	1082.17	ND	URS OCT/NOV 05
GP-T08-02	2625967.84	498089.49	73	1073.62	ND	URS OCT/NOV 05
GP-T08-03	2625161.86	497466.38	79	1083.27	ND	URS OCT/NOV 05
GP-T08-04	2624276.73	497047.18	67	1082.82	0.27	URS OCT/NOV 05
GP-T08-05	2623491.59	496495.07	65	1076.60	ND	URS OCT/NOV 05
GP-T08-06	2622640.25	495847.09	70	1083.46	ND	URS OCT/NOV 05
GP-T08-07	2621802.25	495200.33	70	1079.90	ND	URS OCT/NOV 05
GP-T08-08	2627824.82	499275.67	65	1080.06	ND	URS OCT/NOV 05
GP-T08-09	2628520.88	499899.83	65	1070.69	ND	URS OCT/NOV 05
GP-T09-01	2619568.54	498778.47	65	1088.07	ND	URS OCT/NOV 05
GP-T09-02	2618986.00	498033.93	65	1089.25	15	URS OCT/NOV 05
GP-T09-03	2618399.30	497322.98	75	1081.89	45	URS OCT/NOV 05
GP-T09-04	2617720.38	496742.77	65	1084.14	ND	URS OCT/NOV 05
GP-T09-05	2616997.47	496202.59	65	1087.74	ND	URS OCT/NOV 05
GP-T09-06	2615880.57	495315.35	75	1093.14	ND	URS OCT/NOV 05
GP-T09-07	2614375.30	494407.80	75	1077.62	ND	URS OCT/NOV 05
GP-T09-08	2615097.56	494809.43	85	1076.15	ND	URS OCT/NOV 05
GP-T09-09	2618682.45	497688.03	65	1088.60	0.26	URS OCT/NOV 05
GP-T09-10	2618050.88	497037.87	65	1092.09	4.4	URS OCT/NOV 05
GP-T10-01	2620386.66	499031.05	65	1087.14	ND	URS OCT/NOV 05
GP-T10-02	2621507.22	498979.37	65	1084.70	1.1	URS OCT/NOV 05
GP-T10-03	2622463.91	498898.60	65	1082.83	ND	URS OCT/NOV 05
GP-T10-04	2623435.32	498837.93	81	1071.10	0.32	URS OCT/NOV 05

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
GP-T11-01	2621867.53	502073.80	80	1077.42	5.5	URS OCT/NOV 05
GP-T11-02	2621271.49	501286.96	65	1088.32	ND	URS OCT/NOV 05
GP-T11-03	2620674.27	500588.56	62	1093.47	6.6	URS OCT/NOV 05
GP-T11-04	2620113.24	499582.35	65	1090.45	ND	URS OCT/NOV 05
GP-T11-05	2622163.30	502497.46	65	1090.22	2.7	URS OCT/NOV 05
GP-T11-06	2622961.25	503628.20	64	1094.17	ND	URS OCT/NOV 05
GP-T12-01	2619728.82	493572.95	65	1085.81	ND	URS OCT/NOV 05
GP-T12-02	2620330.38	494125.83	65	1083.57	ND	URS OCT/NOV 05
GP-T12-03	2620890.67	494602.24	70	1075.80	ND	URS OCT/NOV 05
GP-T13-01	2628700.20	497327.18	75	1074.60	ND	URS OCT/NOV 05
GP-T13-02	2629346.00	498171.17	65	1065.57	ND	URS OCT/NOV 05
GP-T13-10	2632669.14	501518.82	37	1070.97	ND	URS MARCH 06
GP-T13-11	2632896.93	501983.37	40	1067.31	8.7	URS MARCH 06
GP-T13-12	2633148.94	502540.35	24	1070.66	ND	URS MARCH 06
GP-T15-01	2628496.78	506829.85	55	1090.98	2.3	URS OCT/NOV 05
GP-T15-02	2627999.03	506619.55	55	1093.70	ND	URS OCT/NOV 05
GP-T15-03	2627602.36	506349.37	55	1094.50	ND	URS OCT/NOV 05
GP-T15-04	2627239.15	506097.58	55	1094.61	ND	URS OCT/NOV 05
GP-T15-06	2626380.38	505723.07	60	1092.80	ND	URS OCT/NOV 05
GP-T15-07	2625934.53	505456.08	60	1099.03	ND	URS OCT/NOV 05
GP-T15-08	2625432.67	505155.00	60	1091.01	ND	URS OCT/NOV 05
GP-T15-09	2625094.66	505054.52	60	1093.14	ND	URS OCT/NOV 05
GP-T15-10	2624651.96	504854.01	60	1088.57	2.5	URS OCT/NOV 05
GP-T15-11	2624407.59	504630.37	60	1092.99	ND	URS OCT/NOV 05
GP-T16-01	2629203.84	505681.43	55	1087.68	2.6	URS OCT/NOV 05
GP-T16-02	2628726.95	505436.47	55	1087.80	5.3	URS OCT/NOV 05
GP-T16-03	2628171.74	505179.13	55	1088.29	4.2	URS OCT/NOV 05
GP-T16-04	2627846.86	505023.71	55	1088.81	ND	URS OCT/NOV 05
GP-T16-05	2627397.66	504828.56	55	1092.86	ND	URS OCT/NOV 05
GP-T16-06	2626989.05	504550.11	55	1091.38	ND	URS OCT/NOV 05
GP-T16-07	2626631.94	504313.44	55	1093.19	ND	URS OCT/NOV 05
GP-T16-08	2626243.08	504049.51	55	1090.96	ND	URS OCT/NOV 05
GP-T16-09	2625847.47	503768.33	55	1090.81	ND	URS OCT/NOV 05
GP-T16-10	2625483.25	503511.96	55	1091.74	ND	URS OCT/NOV 05
GP-T16-11	2629677.72	505770.20	56	1086.94	3.6	URS MARCH 06
GP-T16-12	2629950.20	506202.03	60	1082.87	ND	URS MARCH 06
GP-T16-13	2630554.48	506691.28	45	1076.86	ND	URS MARCH 06
GP-T19-01	2622762.92	507534.43	65	1097.67	ND	URS MARCH 06
GP-T19-02	2623161.29	507839.29	65	1097.57	ND	URS MARCH 06
GP-T19-03	2623576.43	508151.70	65	1100.59	ND	URS MARCH 06
GP-T19-04	2623950.09	508440.32	60	1104.38	ND	URS MARCH 06
GP-T19-05	2624374.55	508771.15	60	1101.16	ND	URS MARCH 06
GP-T19-06	2624727.53	509053.26	60	1100.02	ND	URS MARCH 06
GP-T19-07	2625143.03	509334.74	60	1104.65	ND	URS MARCH 06
GP-T19-08	2625458.31	509630.56	45	1115.63	ND	URS MARCH 06
GP-T19-09	2625793.52	509964.93	42	1116.55	ND	URS MARCH 06
GP-T19-10	2626216.61	510332.85	40	1107.53	ND	URS MARCH 06
GP-T19-11	2627092.47	510919.85	35	1103.17	ND	URS MARCH 06
GP-T20-01	2623130.50	505463.92	70	1093.29	ND	URS MARCH 06

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
GP-T20-02	2623536.33	505819.31	65	1096.58	ND	URS MARCH 06
GP-T20-03	2623909.92	506156.47	55	1096.54	0.98	URS MARCH 06
GP-T20-04	2624237.72	506626.64	65	1097.50	ND	URS MARCH 06
GP-T20-05	2624645.79	506791.19	55	1105.69	ND	URS MARCH 06
GP-T20-06	2625085.73	507062.70	59	1102.27	ND	URS MARCH 06
GP-T20-07	2625465.24	507317.68	60	1100.81	ND	URS MARCH 06
GP-T20-08	2625859.11	507579.81	60	1099.40	ND	URS MARCH 06
GP-T20-09	2626355.84	507906.86	60	1104.08	ND	URS MARCH 06
GP-T20-10	2626762.96	508238.88	55	1106.57	0.29	URS MARCH 06
GP-T20-11	2627149.06	508559.68	55	1099.15	ND	URS MARCH 06
GP-T20-13	2628017.96	509096.70	35	1087.74	ND	URS MARCH 06
GP-T20-14	2628408.81	509356.14	39	1107.01	ND	URS MARCH 06
GP-T21-01	2630721.19	505245.84	65	1076.80	ND	URS MARCH 06
GP-T21-02	2631110.35	505824.13	55	1087.01	0.5	URS MARCH 06
GP-T21-03	2631437.38	506054.57	55	1085.55	ND	URS MARCH 06
GP-T21-04	2631674.45	506273.77	65	1075.58	ND	URS MARCH 06
GP-T22-01	2631531.82	504375.77	56	1084.16	0.74	URS MARCH 06
GP-T22-02	2631979.58	504870.52	56	1085.52	ND	URS MARCH 06
GP-T22-03	2631945.48	505446.22	58	1085.53	ND	URS MARCH 06
GP-T22-04	2632383.92	505672.31	55	1082.45	ND	URS MARCH 06
GP-T23-01	2633127.12	503142.90	33	1071.10	0.52	URS MARCH 06
GP-T23-02	2633201.40	503711.37	32	1071.72	ND	URS MARCH 06
GP-T23-03	2633324.90	504359.25	24	1077.68	ND	URS MARCH 06
GP-T23-04	2633152.01	504676.61	44	1078.73	ND	URS MARCH 06
GP-T25-01	2635697.46	501884.99	24	1061.05	ND	URS MARCH 06
GP-T25-02	2636032.58	502542.12	24	1064.26	ND	URS MARCH 06
GP-T25-03	2636333.75	502908.74	24	1062.06	ND	URS MARCH 06
GP-T26-01	2636851.73	500854.84	24	1056.77	ND	URS MARCH 06
GP-T26-02	2637375.90	500908.70	24	1058.35	ND	URS MARCH 06
GP-T27-01	2636047.90	498418.21	24	1053.61	ND	URS MARCH 06
GP-T27-02	2636546.24	498454.01	20	1059.66	ND	URS MARCH 06
GP-T27-03	2637038.44	498491.20	24	1054.33	ND	URS MARCH 06
GP-T27-04	2637547.06	498517.46	20	1059.50	ND	URS MARCH 06
NL1-DP01	2606516.31	507527.42	44	1125.83	21	UNL JAN-06
NL2-DP01	2611869.37	507668.32	44	1129.36	20	UNL JAN-06
MW-01B	2618469.56	511743.23			ND	GMP JUN-93
MW-02B	2606808.90	506255.48			1.3	GMP DEC-00
MW-03B	2607542.05	506225.42			0.81	GMP JUN-95
MW-04B	2612051.44	506259.36			12.2	GMP MAR-03
MW-05B	2613053.87	507097.47			30.9	GMP SEP-03
MW-06B	2617384.61	506525.48			ND	GMP JUN-95
MW-07B	2618276.53	507276.12			1.54	GMP MAR-03
MW-08B	2622872.08	506820.56			1.42	GMP MAR-03
MW-09B	2623580.33	507436.09			ND	GMP MAR-06
MW-10B	2607893.74	496858.92			0.117	GMP MAR-06
MW-11	2626486.32	509499.80			ND	GMP MAR-06
MW-12	2606856.25	509013.88			ND	GMP JUN-93
MW-13	2612231.38	509178.55			ND	GMP JUN-93

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
MW-14	2617504.71	509391.07			ND	GMP JUN-95
MW-15	2622745.33	509482.90			ND	GMP JUN-95
MW-16C	2604917.63	514034.74			3	GMP JUN-95
MW-17C	2603293.48	499090.31			ND	GMP MAR-04
MW-18C	2629148.53	506821.93			6.37	GMP MAR-06
MW-19C	2618426.14	517568.83			ND	GMP JUL-97
MW-20C	2616611.43	493187.61			ND	GMP SEP-03
MW-21B	2607111.29	503524.05			10.6	GMP MAR-06
MW-22B	2606604.48	510403.43			0.69	GMP JUN-95
MW-23B	2606393.06	509383.87			ND	GMP SEP-03
MW-24B	2608477.73	501909.01			0.911	GMP MAR-06
MW-25B	2608308.27	504885.58			0.62	GMP MAR-03
MW-26B	2609849.90	508824.87			ND	GMP MAY-93
MW-27B	2611427.01	508110.55			ND	GMP MAY-93
MW-28B	2612936.01	502242.26			6.84	GMP MAR-06
MW-29B	2614460.98	498382.37			ND	GMP MAR-06
MW-30B	2616281.84	507065.86			ND	GMP DEC-94
MW-31B	2617935.17	503238.63			1.15	GMP MAR-06
MW-32B	2619696.91	499069.08			3.04	GMP MAR-06
MW-33B	2622401.05	502854.78			0.431	GMP MAR-06
MW-34B	2624443.06	498814.11			0.63	GMP MAR-06
MW-35B	2629595.84	496329.37			0.276	GMP MAR-06
MW-36B	2634805.75	496692.86			ND	GMP MAR-06
MW-37B	2633416.51	491631.65			ND	GMP MAR-06
MW-40B	2623006.75	511962.76			ND	GMP JUN-93
MW-41B	2624361.83	512001.37			ND	GMP JUN-93
MW-42B	2629385.28	501592.64			0.29	GMP MAR-06
MW-43B	2629244.24	504328.20			17.6	GMP MAR-06
MW-44B	2632954.90	500426.32			ND	GMP MAR-06
MW-45B	2635053.92	499241.15			5.27	GMP MAR-06
MW-46B	2637464.42	499396.68			ND	GMP MAR-06
MW-47B	2603819.42	524480.21			ND	GMP JUL-97
MW-48B (Abandoned)	2607442.66	519367.88			ND	GMP DEC-00
MW-52B	2627004.24	508778.94			ND	UNL FEB-06
MW-53B	2627885.40	508166.61			2.6	UNL FEB-06
MW-54B	2627883.88	508855.98			ND	GMP MAR-06
MW-55B	2628125.88	508374.22			0.21	UNL FEB-06
MW-56B	2628195.32	508217.29			ND	UNL FEB-06
MW-57B	2607621.51	516363.44			ND	GMP JUN-95
MW-58B (Abandoned)	2620346.02	515009.76			ND	GMP DEC-00
MW-59B (Abandoned)	2621700.91	515887.73			ND	GMP DEC-00
MW-60B	2624703.22	489598.70			ND	GMP SEP-04
MW-61B	2608644.38	492898.60			ND	GMP MAR-06
MW-62B	2635385.06	493871.95			ND	GMP MAR-06
MW-64B	2628038.55	510106.02			ND	GMP JUL-97
MW 65B	2613193.30	506091.23			80	GCW MAR-01
MW 66B	2613268.32	506027.61			1	GCW MAR-01
MW 67B	2613314.55	505999.49			2.9	GCW MAR-01
MW 68B	2613320.78	506024.53			1.9	GCW MAR-01
MW 69B	2613341.62	506046.74			100	GCW MAR-01

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
MW 70B	2613362.30	506068.63			94	GCW MAR-01
MW 71B	2613382.62	506090.27			82	GCW MAR-01
MW-79B	2610428.14	492345.18			ND	GMP MAR-06
MW-80B	2610916.24	492064.59			ND	GMP MAR-06
MW-81B	2611635.91	492360.36			ND	GMP MAR-06
MW-82B	2619284.94	493325.47			ND	GMP MAR-06
MW-83B	2621921.79	495302.77			0.832	GMP MAR-06
MW-84B	2624272.04	495712.90			ND	GMP MAR-06
MW-85B	2628315.15	494449.81			1.28	GMP MAR-06
MW-89B	2610408.69	494254.10			ND	GMP MAR-06
MW-90B	2611226.60	494297.96			ND	GMP MAR-06
MW-91B	2612067.85	494317.53			ND	GMP MAR-06
MW-92B	2610047.80	492733.82			ND	GMP MAR-06
MW-93B	2612154.07	493546.80			ND	GMP MAR-06
NLF-MW01S	2627482.80	508537.55			ND	UNL FEB-06
NLF-MW02S	2627651.96	508654.32			ND	UNL FEB-06
NLF-MW03S	2627718.61	508563.28			ND	UNL FEB-06
NLF-MW04S	2627719.69	508471.47			ND	UNL FEB-06
NLF-MW05S	2627687.94	508382.55			1.1	UNL FEB-06
NLF-MW06S	2627629.12	508365.46			2.7	UNL FEB-06
NLF-MW07S	2627553.24	508403.93			ND	UNL FEB-06
NPR-MW01S	2626816.17	504709.21			ND	UNL FEB-06
NPR-MW02S	2626883.56	504555.87			ND	UNL FEB-06
GP-01 (BAZE)	2613594.24	505960.18	68	1101.80	5	URS SEP 03
GP-02 (BAZE)	2613985.82	505467.37	68	1102.10	83	URS SEP 03
GP-03 (BAZE)	2613971.32	503613.72	78	1091.34	47	URS SEP 03
GP-04 (BAZE)	2614076.41	503057.19	78	1087.45	4	URS SEP 03
GP-05 (BAZE)	2616013.31	502310.24	68	1095.82	994	URS SEP 03
GP-06 (BAZE)	2616183.97	501681.30	48	1113.07	44	URS SEP 03
GP-07 (BAZE)	2612960.22	507524.02	58	1112.44	0.4	URS SEP 03
GP-08 (BAZE)	2613744.74	503604.93	48	1122.06	ND	URS SEP 03
GP-09 (BAZE)	2614191.45	502628.93	58	1105.48	ND	URS SEP 03
GP-10 (BAZE)	2615489.34	502719.44	68	1096.43	1.1	URS SEP 03
GP-11 (BAZE)	2615977.74	500980.93	68	1092.44	1.1	URS SEP 03
GP-12 (BAZE)	2614256.19	504895.01	68	1100.57	ND	URS SEP 03
GP-13 (BAZE)	2614421.18	504929.64	68	1102.44	ND	URS SEP 03
BAZE-MW-01	2616042.51	502209.13	65	1097.28	399	URS DEC 03
BAZE-MW-02	2616116.85	502075.19	55	1106.45	74.1	URS DEC 03
BAZE-MW-03	2616128.60	502084.65	65	1096.50	46.1	URS DEC 03
BAZE-MW-04	2616140.55	502094.05	65	1096.47	110	URS DEC 03
BAZE-MW-05	2616145.22	502038.03	65	1096.40	172	URS DEC 03
BAZE-MW-06	2616157.13	502044.01	65	1096.44	160	URS DEC 03
BAZE-MW-07	2616168.23	502053.89	65	1096.48	240	URS DEC 03
BAZE-MW-08	2616202.28	501950.73	65	1096.43	136	URS DEC 03
BAZE-MW-09	2616214.12	501959.62	65	1096.43	129	URS DEC 03
BAZE-MW-10	2616225.63	501970.02	65	1096.43	122	URS DEC 03
BAZE-MW-11	2616437.05	501626.79	55	1105.44	70	URS DEC 03
DP-79-1	2610502.78	492279.38	44	1057.11	ND	ECC JUNE 04
DP-79-2	2610594.92	492140.15	43	1058.24	ND	ECC JUNE 04
DP-79-3	2610681.16	492035.13	43	1057.53	ND	ECC JUNE 04

Table 3-1
RDX in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
DP-80-2	2610856.75	492241.60	42	1060.11	ND	ECC JUNE 04
DP-80-3	2610934.75	492082.32	42	1058.44	ND	ECC JUNE 04
DP-81-1	2611193.13	492277.90	43	1059.54	ND	ECC JUNE 04
DP-81-2	2611331.06	492116.13	44	1057.56	ND	ECC JUNE 04
DP-81-3	2611405.99	491993.92	43	1058.19	ND	ECC JUNE 04
DP-82-1	2619171.52	493174.18	63	1087.49	ND	ECC JUNE 04
DP-82-2	2619225.33	493005.06	63	1087.99	ND	ECC JUNE 04
DP-83-1	2621916.18	495259.48	70	1080.44	0.43	ECC JUNE 04
DP-83-2	2621983.52	495163.83	83	1067.44	ND	ECC JUNE 04
DP-84-1	2624254.30	495702.39	67	1076.63	ND	ECC JUNE 04
DP-84-2	2624352.62	495524.18	67	1080.98	ND	ECC JUNE 04
DP-85-1	2628364.68	494414.53	52	1078.44	0.71	ECC JUNE 04
DP-85-2	2628467.72	494123.52	67	1065.37	ND	ECC JUNE 04
DP-86-1	2631988.92	493956.51	42	1064.13	0.97	ECC JUNE 04
DP-86-2	2632105.26	494008.75	27	1079.89	ND	ECC JUNE 04
DP-87-1	2635425.10	486859.84	21	1049.24	ND	ECC JUNE 04
DP-87-2	2635229.37	492134.11	10	1066.51	ND	ECC JUNE 04
DP-88-1	2637614.82	494016.68	28	1056.84	ND	ECC JUNE 04

Table 3-2
RDX in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
CU-01	2607366.14	506814.94			ND	GMP JUN-96
CU-02	2606572.16	503260.40			ND	GMP JUN-96
CU-03	2608970.75	497263.84			ND	GMP JUL-96
CU-04	2608896.84	496799.89			ND	GMP JUN-01
CU-05	2608553.23	495506.84			ND	GMP JUL-96
CU-06	2610792.37	509337.77			ND	GMP JUN-96
CU-07	2611883.90	509417.04			ND	GMP JUL-99
CU-08	2612786.92	508535.14			ND	GMP JUN-96
CU-09	2610586.65	499876.06			0.4	GMP JUN-96
CU-10	2605708.95	500244.02			ND	GMP JUN-96
CU-11	2607638.20	505704.78			ND	GMP JUN-01
CU-12	2604614.02	497524.05			ND	GMP JUN-01
CU-13	2609168.13	496683.63			ND	GMP JUN-01
CU-14	2609142.15	495938.85			ND	GMP JUL-96
CU-15	2608825.36	494386.47			ND	GMP JUL-96
CU-17	2611895.55	509182.49			ND	GMP JUN-96
CU-18	2611773.60	509110.35			ND	GMP JUN-96
CU-19	2612683.25	507157.48			ND	GMP JUN-96
CU-20	2612755.47	507025.32			ND	GMP JUN-96
CU-21	2617125.86	509520.51			ND	GMP JUN-96
CU-22	2618057.69	507282.18			ND	GMP JUN-96
CU-23	2626875.34	504796.33			0.5	GMP JUN-01
CU-24	2616148.95	495448.35			ND	GMP JUN-96
CU-25	2622666.85	507453.20			0.6	GMP JUN-96
UNFL-11A	2608084.08	505573.16			ND	GMP SEP-00
UNFL-8A	2618495.01	506249.95			ND	GMP SEP-00
G-036213(IR-13)	2628061.43	502884.05			4.2	GMP JUN-94
G-096589(IR-15)	2625428.46	502779.58			ND	GMP JUL-97
G-105800(IR-20)	2609634.81	504937.27			ND	GMP SEP-94
G-096584(IR-21)	2609425.47	507511.90			ND	GMP SEP-94
UNFL-IR-4	2619793.86	506293.50			ND	GMP JUL-99
G-033754(IR-7)	2627929.44	506174.88			ND	GMP JUN-94
G-033753(IR-8)	2612233.27	504914.64			70.0	GMP JUN-94
UNFL-S-5	2616129.66	495335.84			ND	GMP DEC-94
UNFL-S-6	2621448.27	495980.71			0.4	GMP DEC-96
UNFL-S-7	2621694.75	501434.23			ND	GMP DEC-97
UNFL-S-8	2609860.25	499863.95			2.6	GMP DEC-93
GP-37	2608712.06	495517.83	97	1060.31	ND	URS MARCH 03
GP-38	2609206.03	495527.71	120	1033.55	0.7	URS MARCH 03
GP-39	2610319.40	495566.35	97	1057.07	ND	URS MARCH 03
GP-40	2610876.37	495589.14	120	1100.41	ND	URS MARCH 03
GP-41	2611433.40	495608.37	107	1053.55	ND	URS MARCH 03
GP-115	2610824.29	492224.62	65	1039.45	ND	URS JAN 06
GP-117	2611209.46	492239.94	65	1038.19	ND	URS JAN 06
GP-118	2610808.42	492036.60	83	1021.48	ND	URS JAN 06
GP-123	2611010.12	491841.51	65	1039.95	ND	URS JAN 06
GP-128	2610777.19	491577.18	85	1021.17	ND	URS JAN 06
GP-129	2611241.73	491591.47	84	1019.95	ND	URS JAN 06
GP-T02-01	2629114.49	500712.78	95	1045.17	ND	URS OCT/NOV 05
GP-T02-02	2629350.26	501091.42	75	1062.68	ND	URS OCT/NOV 05

Table 3-2
RDX in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
GP-T02-03	2629429.55	501269.68	93	1044.61	0.4	URS OCT/NOV 05
GP-T02-04	2630828.86	503085.51	75	1063.13	2	URS OCT/NOV 05
GP-T02-05	2631124.11	503944.37	75	1064.44	2.3	URS OCT/NOV 05
GP-T02-06	2629369.61	501941.94	103	1045.20	2.3	URS OCT/NOV 05
GP-T02-07	2629364.01	502468.62	80	1064.25	0.3	URS OCT/NOV 05
GP-T02-08	2629339.51	502902.68	80	1061.29	ND	URS OCT/NOV 05
GP-T02-09	2629316.81	503325.08	80	1061.86	ND	URS OCT/NOV 05
GP-T04-05	2634029.90	501862.69	24	1060.08	4.8	URS OCT/NOV 05
GP-T04-06	2633957.20	500315.11	24	1055.64	ND	URS OCT/NOV 05
GP-T06-01	2629670.98	495178.97	91	1052.60	ND	URS OCT/NOV 05
GP-T06-02	2629404.85	494351.18	79	1047.09	0.47	URS OCT/NOV 05
GP-T06-03	2629085.50	493685.38	70	1059.32	ND	URS OCT/NOV 05
GP-T06-04	2630155.07	493893.63	60	1057.85	ND	URS OCT/NOV 05
GP-T06-05	2630102.69	493676.69	91	1042.29	0.47	URS OCT/NOV 05
GP-T07-01	2627838.52	496049.29	97	1046.12	ND	URS OCT/NOV 05
GP-T07-02	2627513.19	495313.11	80	1064.03	0.34	URS OCT/NOV 05
GP-T07-03	2627301.43	494826.94	90	1044.55	0.3	URS OCT/NOV 05
GP-T07-04	2627029.12	494193.44	85	1057.34	ND	URS OCT/NOV 05
GP-T08-01	2626866.04	498636.49	115	1047.17	4.3	URS OCT/NOV 05
GP-T08-02	2625967.84	498089.49	85	1061.62	ND	URS OCT/NOV 05
GP-T08-03	2625161.86	497466.38	115	1047.27	0.42	URS OCT/NOV 05
GP-T08-04	2624276.73	497047.18	85	1064.82	ND	URS OCT/NOV 05
GP-T08-05	2623491.59	496495.07	94	1047.60	0.6	URS OCT/NOV 05
GP-T08-06	2622640.25	495847.09	99	1054.46	ND	URS OCT/NOV 05
GP-T08-07	2621802.25	495200.33	102	1047.90	1.3	URS OCT/NOV 05
GP-T08-08	2627824.82	499275.67	84	1061.06	ND	URS OCT/NOV 05
GP-T08-09	2628520.88	499899.83	79	1056.69	ND	URS OCT/NOV 05
GP-T09-01	2619568.54	498778.47	103	1050.07	0.25	URS OCT/NOV 05
GP-T09-02	2618986.00	498033.93	102	1052.25	15	URS OCT/NOV 05
GP-T09-03	2618399.30	497322.98	103	1053.89	85	URS OCT/NOV 05
GP-T09-04	2617720.38	496742.77	83	1066.14	ND	URS OCT/NOV 05
GP-T09-05	2616997.47	496202.59	84	1068.74	ND	URS OCT/NOV 05
GP-T09-06	2615880.57	495315.35	117	1051.14	ND	URS OCT/NOV 05
GP-T09-07	2614375.30	494407.80	95	1057.62	ND	URS OCT/NOV 05
GP-T09-08	2615097.56	494809.43	107	1054.15	ND	URS OCT/NOV 05
GP-T09-09	2618682.45	497688.03	100	1053.60	51	URS OCT/NOV 05
GP-T09-10	2618050.88	497037.87	105	1052.09	0.43	URS OCT/NOV 05
GP-T10-01	2620386.66	499031.05	79	1073.14	1.8	URS OCT/NOV 05
GP-T10-02	2621507.22	498979.37	101	1048.70	3	URS OCT/NOV 05
GP-T10-03	2622463.91	498898.60	101	1046.83	ND	URS OCT/NOV 05
GP-T10-04	2623435.32	498837.93	99	1053.10	0.82	URS OCT/NOV 05
GP-T11-01	2621867.53	502073.80	95	1062.42	5	URS OCT/NOV 05
GP-T11-02	2621271.49	501286.96	85	1068.32	ND	URS OCT/NOV 05
GP-T11-03	2620674.27	500588.56	82	1073.47	ND	URS OCT/NOV 05
GP-T11-04	2620113.24	499582.35	102	1053.45	3.3	URS OCT/NOV 05
GP-T11-05	2622163.30	502497.46	102	1053.22	12	URS OCT/NOV 05
GP-T11-06	2622961.25	503628.20	104	1054.17	ND	URS OCT/NOV 05
GP-T12-01	2619728.82	493572.95	85	1065.81	ND	URS OCT/NOV 05
GP-T12-02	2620330.38	494125.83	100	1048.57	ND	URS OCT/NOV 05
GP-T12-03	2620890.67	494602.24	85	1060.80	ND	URS OCT/NOV 05

Table 3-2
RDX in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
GP-T13-01	2628700.20	497327.18	107	1042.60	1.9	URS OCT/NOV 05
GP-T13-02	2629346.00	498171.17	79	1051.57	ND	URS OCT/NOV 05
GP-T13-03	2630026.66	499045.68	65	1064.23	ND	URS OCT/NOV 05
GP-T13-04	2629024.71	497772.26	75	1063.11	1.6	URS OCT/NOV 05
GP-T13-05	2629720.17	498703.20	65	1064.88	ND	URS OCT/NOV 05
GP-T13-10	2632669.14	501518.82	50	1057.97	ND	URS MARCH 06
GP-T13-11	2632896.93	501983.37	52	1055.31	4.1	URS MARCH 06
GP-T13-12	2633148.94	502540.35	41	1053.66	0.65	URS MARCH 06
GP-T15-12	2629132.22	507086.27	50	1069.86	ND	URS OCT/NOV 05
GP-T16-11	2629677.72	505770.20	80	1062.94	ND	URS MARCH 06
GP-T16-12	2629950.20	506202.03	80	1062.87	ND	URS MARCH 06
GP-T16-13	2630554.48	506691.28	61	1060.86	ND	URS MARCH 06
MW-01A	2618459.72	511743.03			ND	GMP JUN-93
MW-02A	2606800.10	506250.32			ND	GMP DEC-00
MW-03A	2607532.26	506223.42			1.7	GMP JUN-95
MW-04A	2612041.94	506256.77			1.05	GMP MAR-03
MW-05A	2613044.09	507097.63			0.62	GMP SEP-03
MW-06A	2617375.69	506522.12			ND	GMP JUN-95
MW-07A	2618267.10	507274.83			ND	GMP JUN-95
MW-08A	2622863.97	506814.76			ND	GMP JUN-95
MW-09A	2623570.81	507435.84			ND	GMP MAR-06
MW-10A	2607883.83	496858.27			ND	GMP MAR-06
MW-16B	2604911.66	514026.38			ND	GMP JUN-95
MW-17B	2603293.03	499101.48			ND	GMP MAR-05
MW-18B	2629156.57	506827.46			ND	GMP MAR-06
MW-19B	2618429.63	517576.97			ND	GMP JUL-97
MW-20B	2616633.43	493191.47			ND	GMP MAR-06
MW-21A	2607121.37	503524.81			ND	GMP MAR-06
MW-22A	2606598.39	510402.07			ND	GMP JUN-95
MW-23A	2606402.57	509376.37			ND	GMP JUN-95
MW-24A	2608476.90	501919.83			ND	GMP MAR-06
MW-25A	2608308.41	504875.16			0.62	GMP MAR-03
MW-26A	2609860.44	508825.09			ND	GMP MAY-93
MW-27A	2611434.64	508103.04			ND	GMP MAY-93
MW-28A	2612951.02	502242.71			ND	GMP MAR-06
MW-29A	2614469.84	498383.11			2.73	GMP MAR-06
MW-30A	2616288.05	507064.55			ND	GMP JUN-94
MW-31A	2617943.95	503233.70			ND	GMP MAR-06
MW-32A	2619697.25	499062.26			6.39	GMP MAR-06
MW-33A	2622410.84	502847.91			3.11	GMP MAR-06
MW-34A	2624442.78	498806.30			ND	GMP MAR-06
MW-35A	2629595.76	496323.64			ND	GMP MAR-06
MW-36A	2634814.84	496694.95			ND	GMP MAR-06
MW-37A	2633418.32	491651.94			ND	GMP MAR-06
MW-38A	2638131.88	496248.57			ND	GMP MAR-06
MW-39A	2640060.00	499307.00			ND	GMP MAR-06
MW-40A	2623018.62	511963.35			ND	GMP JUN-93
MW-41A	2624371.47	512001.33			ND	GMP JUN-93
MW-42A	2629385.20	501582.56			4.81	GMP MAR-06
MW-43A	2629243.07	504317.91			ND	GMP MAR-06

Table 3-2
RDX in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
MW-44A	2632953.68	500415.12			ND	GMP MAR-06
MW-45A	2635043.54	499241.12			4.23	GMP MAR-06
MW-46A	2637464.94	499387.37			ND	GMP MAR-06
MW-47A	2603834.71	524480.73			ND	GMP JUL-97
MW-48A (Abandoned)	2607436.75	519363.04			ND	GMP DEC-00
MW-52A	2627012.55	508784.57			ND	UNL FEB-06
MW-53A	2627897.77	508169.88			1.3	UNL FEB-06
MW-54A	2627893.82	508858.25			1.57	GMP MAR-06
MW-55A	2628135.40	508377.66			0.27	UNL FEB-06
MW-56A	2628206.01	508215.32			1.2	UNL FEB-06
MW-58A (Abandoned)	2620357.49	515008.03			ND	GMP DEC-00
MW-59A (Abandoned)	2621708.41	515882.45			ND	GMP DEC-00
MW-60A	2624702.83	489585.15			ND	GMP SEP-04
MW-61A	2608656.02	492900.05			ND	GMP MAR-06
MW-62A	2635396.62	493874.24			ND	GMP MAR-06
MW 65A	2613203.05	506090.52			ND	GCW MAR-01
MW 66A	2613278.51	506026.73			ND	GCW MAR-01
MW 67A	2613306.23	506004.48			6.8	GCW MAR-01
MW-79A	2610432.14	492336.21			ND	GMP MAR-06
MW-80A	2610925.54	492067.12			ND	GMP MAR-06
MW-81A	2611637.99	492369.38			ND	GMP MAR-06
MW-82A	2619288.65	493318.05			ND	GMP MAR-06
MW-83A	2621924.08	495274.66			0.689	GMP MAR-06
MW-84A	2624277.77	495685.51			0.397	GMP MAR-06
MW-85A	2628326.53	494439.02			0.822	GMP MAR-06
MW-89A	2610430.84	494253.88			ND	GMP MAR-06
MW-90A	2611235.54	494302.04			ND	GMP MAR-06
MW-91A	2612076.97	494323.00			ND	GMP MAR-06
MW-92A	2610047.26	492722.58			ND	GMP MAR-06
MW-93A	2612162.89	493551.29			ND	GMP MAR-06
TH-EW-12	2610738.32	493102.14			ND	ECC JUL-05
TH-EW-13	2611511.12	493072.65			ND	ECC JUL-05
NLF-MW01I	2627492.64	508537.67			2.3	UNL FEB-06
NLF-MW02I	2627655.27	508651.08			10.0	UNL FEB-06
NLF-MW03I	2627718.46	508576.40			9.4	UNL FEB-06
NLF-MW04I	2627719.58	508481.31			4.3	UNL FEB-06
NLF-MW05I	2627691.34	508372.75			1.3	UNL FEB-06
NLF-MW06I	2627639.03	508359.02			0.35	UNL FEB-06
NLF-MW07I	2627559.79	508404.00			ND	UNL FEB-06
NPR-MW01I	2626822.73	504709.28			ND	UNL FEB-06
NPR-MW02I	2626890.12	504555.94			ND	UNL FEB-06
27	2633476.40	491304.43			ND	GMP SEP-05
29	2632729.38	493681.28			0.406	GMP MAR-06
29A	2632534.17	494638.66			ND	GMP MAR-06
32	2629716.51	491666.47			ND	GMP SEP-05
34	2626827.64	493316.85			ND	GMP SEP-05
36	2622524.39	492493.52			ND	GMP OCT-05
50A	2632370.18	495129.55			ND	GMP MAR-06
50B	2632436.85	496066.20			0.29	GMP MAR-06
51	2632597.38	497396.03			ND	GMP MAR-06

Table 3-2
RDX in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
51A	2632668.59	498157.95			ND	GMP MAR-06
52A	2629661.43	497364.74			0.638	GMP MAR-06
52B	2632545.34	496922.53			ND	GMP MAR-06
52C	2632544.44	500793.18			ND	GMP MAR-06
53	2632924.12	501634.04			0.139	GMP MAR-06
54	2632993.96	502739.60			4.67	GMP MAR-06
55	2636183.31	502038.33			ND	GMP MAR-06
56	2633338.89	504808.40			ND	GMP MAR-06
57	2631644.43	506139.34			ND	GMP MAR-06
58	2629341.33	508353.25			ND	GMP MAR-06
59	2632183.18	505741.87			ND	GMP MAR-06
60	2632265.13	507014.18			ND	GMP MAR-06
61	2633336.15	505318.68			ND	GMP MAR-06
62	2633672.26	506287.24			ND	GMP MAR-06
63	2634067.41	508770.05			ND	GMP SEP-05
64	2634157.44	508043.59			ND	GMP SEP-05
65	2614593.55	491678.09			ND	GMP MAR-06
66	2616208.81	492370.65			ND	GMP MAR-06
67	2616890.53	492515.37			ND	GMP MAR-06
68	2618614.53	492940.88			ND	GMP MAR-06
73	2640113.88	495421.71			ND	GMP OCT-05
74	2640476.82	495423.94			ND	GMP OCT-05
75	2638731.57	494855.11			ND	GMP OCT-05
76	2639193.09	494923.60			ND	GMP SEP-05
77	2639589.02	494926.03			ND	GMP OCT-05
79	2640347.90	494930.69			ND	GMP OCT-05
80	2623649.46	517204.54			ND	GMP SEP-05
81	2628563.41	515053.61			ND	GMP SEP-05
82	2624565.27	515713.36			ND	GMP SEP-05
84	2634199.43	510931.36			ND	GMP SEP-05
86	2638562.12	495576.34			ND	GMP SEP-05
87	2639967.28	497784.61			ND	GMP SEP-05
89	2629391.51	509369.67			ND	GMP MAR-06
90	2634812.02	507983.47			ND	GMP SEP-05
91	2634845.47	505424.35			ND	GMP MAR-06
92	2634909.73	504759.87			ND	GMP MAR-06
93	2638763.34	504473.33			ND	GMP SEP-05
94	2638643.45	504490.04			ND	GMP SEP-05
95	2640416.75	497659.94			ND	GMP SEP-05
96	2640886.44	495636.59			ND	GMP SEP-05
97	2638223.15	496378.67			ND	GMP MAR-06
99	2639130.21	494402.19			ND	GMP SEP-05
100	2615992.13	494940.49			ND	GMP MAR-06
101	2613804.00	488282.00			ND	GMP SEP-05
102	2634808.07	506653.83			ND	GMP SEP-05
103	2639206.57	498075.43			ND	GMP SEP-05
104	2639996.82	498342.92			ND	GMP SEP-05
105	2640496.13	494536.87			ND	GMP SEP-05
106	2638315.64	496388.80			ND	GMP MAR-06
107	2640196.16	499375.50			ND	GMP SEP-05

Table 3-2
RDX in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	RDX Result	Source
108	2630546.01	512117.70			ND	GMP SEP-05
109	2640254.10	493992.07			ND	GMP SEP-05
110	2639142.65	494086.88			ND	GMP SEP-05
111	2634659.97	506407.68			ND	GMP SEP-05
UNFL-23	2608843.30	497126.81			ND	GMP SEP-05
UNFL-27	2618563.96	510045.20			ND	GMP SEP-05
UNFL-10A	2606548.99	503074.78			ND	GMP MAR-06
UNFL-IR-12	2603261.78	506824.04			ND	GMP JUN-05
UNFL-9A	2613347.82	510347.01			ND	GMP JUN-04
EW-1	2634926.92	495190.58			0.127	ECC MAY 06
EW-2	2632445.94	496479.68			1.11	ECC MAY 06
EW-3	2629583.28	497009.50			3.62	ECC MAY 06
EW-4	2627116.10	497384.80			3.04	ECC MAY 06
EW-5	2624295.95	497923.55			0.827	ECC MAY 06
EW-6	2622892.98	497269.75			1.55	ECC MAY 06
EW-7	2621781.70	496331.02			3.35	ECC MAY 06
EW-8	2607945.83	499756.90			0.254	ECC MAY 06
EW-9	2620401.35	495320.23			8.46	ECC MAY 06
EW-10	2619241.53	494857.11			1.02	ECC MAY 06
EW-11	2609168.75	499999.28				
EW-12	2610718.18	493104.87			ND	ECC APRIL 06
EW-13	2611520.73	493092.65				
DP-78-1	2610129.15	492268.53	44	1056.42	ND	ECC JUNE 04
DP-79-2	2610594.92	492140.15	78	1023.24	ND	ECC JUNE 04
DP-80-2	2610856.75	492241.60	78	1024.11	ND	ECC JUNE 04
DP-80-3	2610934.75	492082.32	76	1024.44	ND	ECC JUNE 04
DP-81-1	2611193.13	492277.90	75	1027.54	ND	ECC JUNE 04
DP-81-2	2611331.06	492116.13	84	1017.56	ND	ECC JUNE 04
DP-81-3	2611405.99	491993.92	82	1019.19	ND	ECC JUNE 04
DP-82-1	2619171.52	493174.18	92	1058.49	ND	ECC JUNE 04
DP-82-2	2619225.33	493005.06	92	1058.99	ND	ECC JUNE 04
DP-83-1	2621916.18	495259.48	102	1048.44	0.63	ECC JUNE 04
DP-83-2	2621983.52	495163.83	100	1050.44	ND	ECC JUNE 04
DP-84-1	2624254.30	495702.39	80	1063.63	ND	ECC JUNE 04
DP-84-2	2624352.62	495524.18	81	1066.98	ND	ECC JUNE 04
DP-85-1	2628364.68	494414.53	82	1048.44	ND	ECC JUNE 04
DP-85-2	2628467.72	494123.52	84	1048.37	ND	ECC JUNE 04
DP-86-1	2631988.92	493956.51	57	1049.13	0.96	ECC JUNE 04
DP-86-2	2632105.26	494008.75	53	1053.89	ND	ECC JUNE 04
DP-87-1	2635425.10	486859.84	38	1032.24	ND	ECC JUNE 04
DP-87-2	2635229.37	492134.11	38	1038.51	ND	ECC JUNE 04
DP-88-1	2637614.82	494016.68	47	1037.84	ND	ECC JUNE 04
GP-04 (BAZE)	2614076.41	503057.19	88	1077.45	ND	URS SEP 03
GP-05 (BAZE)	2616013.31	502310.24	88	1075.82	1	URS SEP 03
GP-09 (BAZE)	2614191.45	502628.93	88	1075.48	11	URS SEP 03
GP-10 (BAZE)	2615489.34	502719.44	88	1076.43	0.32	URS SEP 03
GP-11 (BAZE)	2615977.74	500980.93	88	1072.44	1.2	URS SEP 03
GP-12 (BAZE)	2614256.19	504895.01	78	1090.57	ND	URS SEP 03
GP-13 (BAZE)	2614421.18	504929.64	88	1082.44	ND	URS SEP 03

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-01	2609183.72	500357.30	65	1095.86	156.7	URS APRIL 02
GP-01(GCW)	2622029.85	511815.91	50	1120.44	50	URS APRIL 01
GP-02	2608589.56	499995.40	95	1073.56	24.4	URS APRIL 02
GP-02(GCW)	2622720.23	511958.37	50	1120.44	6500	URS APRIL 01
GP-03	2609173.86	499538.94	90	1071.57	7207.9	URS APRIL 02
GP-03(GCW)	2623176.08	512141.11	50	1118.72	210	URS APRIL 01
GP-04	2609727.82	500003.76	80	1087.70	761.1	URS APRIL 02
GP-04(GCW)	2623512.08	512514.43	50	1120.44	ND	URS APRIL 01
GP-05(GCW)	2623805.97	507781.99	60	1110.44	24	URS APRIL 01
GP-06(GCW)	2623766.09	508954.69	60	1105.43	ND	URS APRIL 01
GP-07	2609234.94	498105.80	97	1069.71	102.8	URS APRIL 02
GP-07(GCW)	2623766.26	509286.86	60	1104.71	197	URS APRIL 01
GP-08	2610081.52	498123.45	65	1098.22	81.7	URS APRIL 02
GP-08(GCW)	2624331.92	509363.44	60	1104.07	42	URS APRIL 01
GP-09	2610347.80	496942.73	65	1094.74	ND	URS APRIL 02
GP-09(GCW)	2624654.45	509672.68	60	1106.53	11	URS APRIL 01
GP-10	2609256.60	502858.88	65	1102.93	ND	URS APRIL 02
GP-10(GCW)	2626190.84	504151.64	50	1100.40	ND	URS APRIL 01
GP-11	2609128.62	501626.76	65	1097.90	47725	URS APRIL 02
GP-11(GCW)	2625782.21	505450.01	50	1109.34	ND	URS APRIL 01
GP-12	2609158.71	502145.28	65	1096.83	76.1	URS APRIL 02
GP-12(GCW)	2626935.31	505243.36	50	1104.78	ND	URS APRIL 01
GP-13	2608814.98	501464.63	65	1095.48	5400	URS APRIL 02
GP-13(GCW)	2628006.63	505570.32	50	1097.52	ND	URS APRIL 01
GP-14	2610493.31	500051.92	65	1102.59	ND	URS APRIL 02
GP-14(GCW)	2629191.09	505753.60	50	1094.10	9	URS APRIL 01
GP-15	2610340.45	501453.43	65	1103.50	ND	URS APRIL 02
GP-16	2609556.26	501620.62	65	1097.71	15.5	URS APRIL 02
GP-17	2608546.48	502735.05	65	1097.18	1987.5	URS APRIL 02
GP-18	2611021.03	498143.52	65	1100.32	ND	URS APRIL 02
GP-18(GCW)	2623334.77	512320.67	50	1119.45	245	URS APRIL 01
GP-19	2608403.18	503617.18	100	1077.54	2986.7	URS APRIL 02
GP-19(GCW)	2622396.04	511952.42	50	1120.44	ND	URS APRIL 01
GP-20	2607973.36	504537.76	100	1076.57	9.2	URS APRIL 02
GP-20(GCW)	2622351.10	512284.84	50	1120.44	4	URS APRIL 01
GP-21	2608785.68	503586.85	100	1077.90	4.4	URS APRIL 02
GP-21(GCW)	2622808.38	511609.09	50	1119.33	16000	URS APRIL 01
GP-22	2608093.72	503828.42	72	1100.41	979.2	URS APRIL 02
GP-22(GCW)	2622915.79	511786.76	50	1118.33	13000	URS APRIL 01
GP-23	2607751.12	504328.03	72	1098.04	23168.8	URS APRIL 02
GP-23(GCW)	2623008.77	511616.91	50	1117.43	11000	URS APRIL 01
GP-24	2607299.60	506024.73	70	1107.51	ND	URS APRIL 02
GP-24(GCW)	2622475.70	511449.10	50	1120.43	ND	URS APRIL 01
GP-25	2606419.74	505931.58	70	1098.96	417.2	URS APRIL 02
GP-25(GCW)	2622868.32	511420.87	50	1119.56	12000	URS APRIL 01
GP-26	2606115.97	506360.90	70	1097.45	351.3	URS APRIL 02
GP-26(GCW)	2623173.86	511393.78	50	1118.43	7600	URS APRIL 01
GP-27	2605658.96	507151.12	70	1099.55	ND	URS APRIL 02
GP-27(GCW)	2623532.89	511979.46	50	1117.35	79	URS APRIL 01
GP-28	2605668.14	506608.63	60	1106.52	ND	URS APRIL 02

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-28(GCW)	2623734.63	509926.23	60	1107.34	220	URS APRIL 01
GP-29	2606185.75	507076.35	70	1102.27	1968.3	URS APRIL 02
GP-29(GCW)	2623371.85	507650.32	60	1102.50	ND	URS APRIL 01
GP-30	2605605.21	506900.91	70	1097.46	ND	URS APRIL 02
GP-30(GCW)	2623178.08	509255.03	60	1106.52	20	URS APRIL 01
GP-31	2606120.58	507970.94	65	1106.76	73.4	URS APRIL 02
GP-31(GCW)	2629243.86	504928.59	50	1095.44	7	URS APRIL 01
GP-32	2611753.31	497146.34	65	1093.50	ND	URS APRIL 02
GP-32(GCW)	2628009.80	504657.77	50	1095.88	13	URS APRIL 01
GP-33	2606868.92	507318.23	55	1115.87	ND	URS APRIL 02
GP-33(GCW)	2626947.84	504628.58	50	1099.34	98	URS APRIL 01
GP-34	2606029.16	505631.93	70	1095.30	ND	URS APRIL 02
GP-34(GCW)	2626586.08	506761.95	60	1096.57	ND	URS APRIL 01
GP-35	2609444.20	496866.70	70	1088.03	ND	URS APRIL 02
GP-35(GCW)	2625041.53	506684.79	60	1097.43	73	URS APRIL 01
GP-36	2606115.85	508407.31	55	1122.51	92.8	URS APRIL 02
GP-36(GCW)	2627183.33	504617.81	60	1088.44	ND	URS APRIL 01
GP-37	2608712.06	495517.83	50	1107.31	ND	URS MARCH 03
GP-37(GCW)	2626589.03	504771.30	60	1090.47	177	URS APRIL 01
GP-38	2609206.03	495527.71	51	1102.55	ND	URS MARCH 03
GP-38(GCW)	2627087.99	504131.36	60	1089.39	115	URS APRIL 01
GP-39	2610319.40	495566.35	50	1104.07	1	URS MARCH 03
GP-40	2610876.37	495589.14	62	1103.41	ND	URS MARCH 03
GP-41	2611433.40	495608.37	59	1101.55	ND	URS MARCH 03
GP-42	2611314.32	498749.66	55	1113.66	ND	URS MARCH 03
GP-43	2609256.06	494565.93	47	1101.85	ND	URS MARCH 03
GP-44	2610450.05	494236.48	97	1061.31	26	URS MARCH 03
GP-45	2611001.26	494249.27	65	1081.38	ND	URS MARCH 03
GP-45(GCW)	2623295.20	511792.88	50	1118.11	240	URS APRIL 01
GP-46	2606542.34	507501.00	48	1122.75	69	URS MARCH 03
GP-46(GCW)	2623447.59	511037.49	50	1117.45	22	URS APRIL 01
GP-47	2606516.35	507497.33	48	1102.71	93	URS MARCH 03
GP-47(GCW)	2623107.75	511031.67	50	1117.42	600	URS APRIL 01
GP-48	2606491.40	507494.25	48	1122.69	200	URS MARCH 03
GP-48(GCW)	2623749.65	509593.36	60	1105.99	124	URS APRIL 01
GP-49	2606477.21	507680.33	48	1122.78	120	URS MARCH 03
GP-49(GCW)	2623599.59	509693.59	60	1107.56	190	URS APRIL 01
GP-50	2606075.21	509008.97	49	1126.04	1	URS MARCH 03
GP-50(GCW)	2623920.24	509344.12	60	1106.26	280	URS APRIL 01
GP-51	2606921.99	507605.86	49	1124.12	ND	URS MARCH 03
GP-51(GCW)	2623414.41	509886.05	60	1107.40	330	URS APRIL 01
GP-52	2606857.82	507621.62	49	1124.82	ND	URS MARCH 03
GP-53	2606813.04	507726.42	49	1124.68	ND	URS MARCH 03
GP-54	2610553.80	493754.99	65	1081.91	ND	URS MARCH 03
GP-55	2606037.34	504655.77	55	1111.79	ND	URS MARCH 03
GP-56	2606572.18	502348.91	48	1119.84	ND	URS MARCH 03
GP-57	2607152.32	498727.01	65	1090.70	ND	URS MARCH 03
GP-58	2609289.31	501675.87	65	1099.51	730	URS MARCH 03
GP-59	2608938.41	501562.06	65	1095.73	4800	URS MARCH 03
GP-60	2609001.61	501849.32	65	1096.30	6400	URS MARCH 03

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-61	2628025.68	508192.45	36	1094.98	28	URS MARCH 03
GP-62	2627986.99	508643.81	28	1098.70	11	URS MARCH 03
GP-63	2626709.07	509393.32	27	1112.81	6	URS MARCH 03
GP-64	2627701.42	508370.54	62	1084.11	11	URS MARCH 03
GP-65	2627662.14	508345.21	62	1085.24	10	URS MARCH 03
GP-66	2627598.28	508307.27	60	1083.72	4	URS MARCH 03
GP-67	2627683.26	508255.24	57	1083.56	16	URS MARCH 03
GP-68	2627748.80	508223.68	55	1083.52	22	URS MARCH 03
GP-69	2627795.31	508225.41	55	1083.14	25	URS MARCH 03
GP-70	2626558.38	509227.02	51	1094.21	3	URS MARCH 03
GP-71	2626287.74	509400.89	34	1119.61	ND	URS MARCH 03
GP-72	2610629.30	493369.10	49	1070.91	ND	URS MARCH 03
GP-73	2609229.36	501403.74	65	1097.28	8200	URS MARCH 03
GP-74	2607626.63	504564.23	70	1102.13	2700	URS MARCH 03
GP-75	2607874.53	504076.86	70	1104.08	4600	URS MARCH 03
GP-76	2607952.68	504315.54	70	1102.64	4900	URS MARCH 03
GP-77	2607556.15	504279.37	70	1098.25	3500	URS MARCH 03
GP-78	2608714.41	502842.54	65	1098.86	280	URS MARCH 03
GP-79	2608341.48	502608.81	70	1095.57	1300	URS MARCH 03
GP-80	2608209.09	502522.71	70	1096.78	1100	URS MARCH 03
GP-81	2608882.77	502951.42	52	1116.82	ND	URS MARCH 03
GP-82	2608850.01	501710.45	65	1095.08	8100	URS MARCH 03
GP-83	2609200.64	501905.80	65	1096.96	2900	URS MARCH 03
GP-84	2626821.56	504718.03	65	1083.36	859	URS MARCH 03
GP-85	2626907.28	504569.30	65	1081.71	677	URS MARCH 03
GP-86	2607408.68	505025.91	70	1103.23	600	URS MARCH 03
GP-87	2610681.40	493090.45	27	1078.02	ND	URS MARCH 03
GP-89	2609677.43	493047.38	25	1082.00	ND	URS MARCH 03
GP-90	2610179.55	493020.78	25	1080.59	1	URS MARCH 03
GP-91	2611098.48	493089.40	25	1080.51	ND	URS MARCH 03
GP-92	2607906.48	504711.56	40	1132.35	ND	URS MARCH 03
GP-93	2607490.26	504493.41	70	1100.53	25500	URS MARCH 03
GP-94	2607378.56	504820.72	70	1100.14	3000	URS MARCH 03
GP-95	2606552.58	508581.28	70	1102.99	3	URS MARCH 03
GP-96	2606178.25	508589.14	70	1110.42	44	URS MARCH 03
GP-97	2605921.74	508596.42	45	1130.01	99	URS MARCH 03
GP-98	2606075.21	509008.97	45	1130.01	140	URS MARCH 03
GP-99	2606277.13	509615.63	45	1128.67	3	URS MARCH 03
GP-100	2607359.69	504233.90	45	1119.40	1500	URS MARCH 03
GP-101	2605955.67	507166.35	70	1098.46	4400	URS MARCH 03
GP-102	2605797.44	508032.31	45	1125.18	55	URS MARCH 03
GP-103	2607205.14	505104.19	70	1099.06	9200	URS MARCH 03
GP-104	2605846.41	507335.61	70	1096.91	52	URS MARCH 03
GP-105	2605712.78	507628.16	45	1127.22	ND	URS MARCH 03
GP-106	2608209.21	503382.62	70	1102.55	9800	URS MARCH 03
GP-107	2606000.97	506873.62	70	1098.27	17400	URS MARCH 03
GP-108	2606947.91	505620.31	70	1097.28	4020	URS MARCH 03
GP-109	2610440.12	492595.48	45	1060.36	4	URS FEB. 06
GP-110	2611127.59	492617.04	45	1059.13	1	URS FEB. 06
GP-111	2611628.21	492632.42	45	1060.87	3	URS FEB. 06

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-112	2610157.66	492447.41	45	1060.81	1	URS FEB. 06
GP-113	2610856.15	492472.63	45	1058.87	36	URS FEB. 06
GP-114	2611422.79	492492.64	25	1078.32	ND	URS FEB. 06
GP-115	2610824.29	492224.62	45	1059.45	32	URS FEB. 06
GP-116	2610579.55	492289.59	45	1060.59	3	URS FEB. 06
GP-117	2611209.46	492239.94	45	1058.19	1	URS FEB. 06
GP-118	2610808.42	492036.60	45	1059.48	9	URS FEB. 06
GP-119	2611360.67	492016.22	25	1078.82	ND	URS FEB. 06
GP-120	2610403.69	492124.08	45	1061.10	3	URS FEB. 06
GP-121	2610169.33	491985.87	25	1080.53	3	URS FEB. 06
GP-122	2610705.39	491897.78	25	1081.46	2	URS FEB. 06
GP-123	2611010.12	491841.51	45	1059.95	8.3	URS FEB. 06
GP-124	2611329.89	491860.03	25	1079.69	ND	URS FEB. 06
GP-125	2610235.81	491778.31	25	1080.24	2	URS FEB. 06
GP-126	2611496.91	491738.69	25	1079.70	2	URS FEB. 06
GP-127	2610302.39	491567.67	25	1081.98	ND	URS FEB. 06
GP-128	2610777.19	491577.18	25	1081.17	ND	URS FEB. 06
GP-129	2611241.73	491591.47	45	1058.95	1	URS FEB. 06
GP-T01-01	2632681.21	496434.55	25	1061.59	4	URS OCT/NOV 05
GP-T01-02	2633251.01	496458.10	26	1050.90	4	URS OCT/NOV 05
GP-T01-03	2633771.81	496481.16	19	1057.06	ND	URS OCT/NOV 05
GP-T01-04	2634313.24	496504.50	20	1056.40	2	URS OCT/NOV 05
GP-T01-05	2634849.94	496524.80	20	1057.13	5	URS OCT/NOV 05
GP-T01-06	2635320.02	497568.18	30	1047.30	33	URS OCT/NOV 05
GP-T01-07	2635864.11	497577.28	20	1058.42	10	URS OCT/NOV 05
GP-T01-08	2636625.08	497586.99	20	1059.49	1.48	URS OCT/NOV 05
GP-T01-09	2637577.58	497601.16	20	1059.27	ND	URS OCT/NOV 05
GP-T01-10	2638535.39	497630.83	19	1059.55	ND	URS OCT/NOV 05
GP-T01-11	2632960.20	496450.10	25	1054.98	ND	URS OCT/NOV 05
GP-T01-12	2634586.09	496513.29	20	1056.22	1	URS OCT/NOV 05
GP-T01-13	2634984.72	497565.75	20	1056.61	21	URS OCT/NOV 05
GP-T01-14	2635569.64	497573.68	20	1057.29	37	URS OCT/NOV 05
GP-T01-15	2637096.19	497593.80	20	1058.09	ND	URS OCT/NOV 05
GP-T01-16	2638101.76	497617.88	19	1059.72	1	URS OCT/NOV 05
GP-T01-17	2632680.74	496431.67	25	1061.79	ND	URS MARCH 06
GP-T01-18	2632724.99	496201.53	25	1058.63	ND	URS MARCH 06
GP-T01-19	2632978.92	496215.56	20	1058.93	ND	URS MARCH 06
GP-T02-01	2629114.49	500712.78	60	1080.17	1	URS OCT/NOV 05
GP-T02-02	2629350.26	501091.42	60	1077.68	ND	URS OCT/NOV 05
GP-T02-03	2629429.55	501269.68	60	1077.61	2	URS OCT/NOV 05
GP-T02-04	2630828.86	503085.51	60	1078.13	4	URS OCT/NOV 05
GP-T02-05	2631124.11	503944.37	60	1079.44	14	URS OCT/NOV 05
GP-T02-06	2629369.61	501941.94	65	1083.20	5.7	URS MARCH 06
GP-T02-07	2629364.01	502468.62	60	1084.25	17	URS MARCH 06
GP-T02-08	2629339.51	502902.68	60	1081.29	68	URS MARCH 06
GP-T02-09	2629316.81	503325.08	60	1081.86	29	URS MARCH 06
GP-T03-01	2635350.27	503934.07	24	1063.35	2	URS OCT/NOV 05
GP-T03-02	2635371.58	503380.67	24	1065.27	ND	URS OCT/NOV 05
GP-T03-03	2635389.80	502847.31	24	1063.60	ND	URS OCT/NOV 05
GP-T03-04	2635410.29	502342.47	24	1061.38	4	URS OCT/NOV 05

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T03-05	2635427.04	501900.87	24	1059.91	20	URS OCT/NOV 05
GP-T03-06	2636186.08	501444.59	24	1058.38	ND	URS OCT/NOV 05
GP-T03-07	2636206.56	500902.04	24	1056.81	19	URS OCT/NOV 05
GP-T03-08	2636224.45	500406.06	22	1058.20	15	URS OCT/NOV 05
GP-T03-09	2636242.95	499929.48	22	1057.80	11	URS OCT/NOV 05
GP-T03-10	2635339.17	504171.73	24	1062.76	ND	URS OCT/NOV 05
GP-T03-11	2635329.91	504384.96	35	1052.50	ND	URS OCT/NOV 05
GP-T04-01	2634160.36	503856.96	18	1073.62	ND	URS OCT/NOV 05
GP-T04-02	2634160.66	503350.42	24	1064.90	7	URS OCT/NOV 05
GP-T04-03	2634131.53	502789.96	24	1062.20	16	URS OCT/NOV 05
GP-T04-04	2634077.45	502297.00	24	1061.26	25	URS OCT/NOV 05
GP-T04-07	2634027.01	499801.15	21	1058.25	6	URS OCT/NOV 05
GP-T04-08	2634160.55	504075.48	18	1074.06	ND	URS OCT/NOV 05
GP-T04-09	2634163.29	504301.79	19	1073.82	ND	URS OCT/NOV 05
GP-T05-01	2632242.02	499455.61	65	1067.59	ND	URS OCT/NOV 05
GP-T05-02	2632696.60	499415.13	26	1070.48	ND	URS OCT/NOV 05
GP-T05-03	2633253.16	499455.75	20	1062.33	8	URS OCT/NOV 05
GP-T05-04	2633738.60	499466.33	20	1058.85	20	URS OCT/NOV 05
GP-T05-05	2634196.41	499486.38	16	1063.05	4	URS OCT/NOV 05
GP-T05-06	2634686.98	499522.54	14	1064.76	7	URS OCT/NOV 05
GP-T05-07	2636339.38	499423.04	19	1059.45	28	URS OCT/NOV 05
GP-T05-08	2637208.11	499445.72	18	1062.18	ND	URS OCT/NOV 05
GP-T05-09	2633965.53	499473.35	19	1059.68	207	URS OCT/NOV 05
GP-T05-10	2634430.02	499508.11	19	1059.63	4	URS OCT/NOV 05
GP-T05-11	2636777.05	499433.48	19	1061.64	ND	URS OCT/NOV 05
GP-T05-12	2632491.57	499449.68	44	1069.52	ND	URS OCT/NOV 05
GP-T09-07	2614375.30	494407.80	75	1077.62	ND	URS OCT/NOV 05
GP-T09-08	2615097.56	494809.43	85	1076.15	ND	URS OCT/NOV 05
GP-T11-05	2622163.30	502497.46	65	1090.22	ND	URS OCT/NOV 05
GP-T11-06	2622961.25	503628.20	64	1094.17	ND	URS OCT/NOV 05
GP-T13-01	2628700.20	497327.18	75	1074.60	ND	URS OCT/NOV 05
GP-T13-02	2629346.00	498171.17	65	1065.57	ND	URS OCT/NOV 05
GP-T13-10	2632669.14	501518.82	37	1070.97	27	URS MARCH 06
GP-T13-11	2632896.93	501983.37	40	1067.31	3	URS MARCH 06
GP-T13-12	2633148.94	502540.35	24	1070.66	ND	URS MARCH 06
GP-T15-01	2628496.78	506829.85	55	1090.98	14	URS OCT/NOV 05
GP-T15-02	2627999.03	506619.55	55	1093.70	12	URS OCT/NOV 05
GP-T15-03	2627602.36	506349.37	55	1094.50	ND	URS OCT/NOV 05
GP-T15-04	2627239.15	506097.58	55	1094.61	2	URS OCT/NOV 05
GP-T15-06	2626380.38	505723.07	60	1092.80	18	URS OCT/NOV 05
GP-T15-07	2625934.53	505456.08	75	1084.03	240	URS OCT/NOV 05
GP-T15-08	2625432.67	505155.00	60	1091.01	61	URS OCT/NOV 05
GP-T15-09	2625094.66	505054.52	75	1078.14	19	URS OCT/NOV 05
GP-T15-10	2624651.96	504854.01	60	1088.57	ND	URS OCT/NOV 05
GP-T15-11	2624407.59	504630.37	75	1077.99	2	URS OCT/NOV 05
GP-T16-01	2629203.84	505681.43	55	1087.68	10	URS OCT/NOV 05
GP-T16-02	2628726.95	505436.47	55	1087.80	8.4	URS OCT/NOV 05
GP-T16-03	2628171.74	505179.13	71	1072.29	6.9	URS OCT/NOV 05
GP-T16-04	2627846.86	505023.71	55	1088.81	2	URS OCT/NOV 05
GP-T16-05	2627397.66	504828.56	55	1092.86	24	URS OCT/NOV 05

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T16-06	2626989.05	504550.11	55	1091.38	520	URS OCT/NOV 05
GP-T16-07	2626631.94	504313.44	55	1093.19	18	URS OCT/NOV 05
GP-T16-08	2626243.08	504049.51	55	1090.96	0.34	URS OCT/NOV 05
GP-T16-09	2625847.47	503768.33	55	1090.81	ND	URS OCT/NOV 05
GP-T16-10	2625483.25	503511.96	55	1091.74	ND	URS OCT/NOV 05
GP-T16-11	2629677.72	505770.20	56	1086.94	28	URS MARCH 06
GP-T16-12	2629950.20	506202.03	60	1082.87	ND	URS MARCH 06
GP-T16-13	2630554.48	506691.28	45	1076.86	ND	URS MARCH 06
GP-T17-01	2618955.26	512412.49	60	1113.08	ND	URS MARCH 06
GP-T17-02	2619391.57	512715.15	55	1119.40	ND	URS MARCH 06
GP-T17-03	2619803.84	513014.44	50	1127.15	ND	URS MARCH 06
GP-T17-04	2620179.87	513293.38	50	1127.97	ND	URS MARCH 06
GP-T17-05	2620595.18	513603.47	73	1103.66	7	URS MARCH 06
GP-T17-06	2620784.70	513740.28	55	1120.86	4	URS MARCH 06
GP-T17-07	2620963.96	513870.18	60	1117.43	244	URS MARCH 06
GP-T17-08	2621183.47	514035.36	64	1112.76	329	URS MARCH 06
GP-T17-09	2621363.25	514176.22	73	1103.29	1400	URS MARCH 06
GP-T17-10	2621567.91	514334.72	63	1114.58	770	URS MARCH 06
GP-T17-11	2621937.35	514642.18	49	1121.90	30	URS MARCH 06
GP-T17-12	2622315.99	514869.19	49	1119.28	ND	URS MARCH 06
GP-T17-13	2622675.32	515121.54	45	1121.92	ND	URS MARCH 06
GP-T18-01	2621318.76	509406.84	60	1110.84	ND	URS MARCH 06
GP-T18-02	2621936.77	509659.12	60	1109.83	ND	URS MARCH 06
GP-T18-03	2622104.68	510041.28	60	1108.71	39	URS MARCH 06
GP-T18-04	2622591.09	510350.90	60	1105.51	16	URS MARCH 06
GP-T18-05	2622933.37	510659.77	60	1108.38	10000	URS MARCH 06
GP-T18-06	2623130.70	510825.62	60	1108.33	6200	URS MARCH 06
GP-T18-07	2623320.39	510995.45	60	1110.94	175	URS MARCH 06
GP-T18-08	2623509.21	511164.97	55	1113.58	61	URS MARCH 06
GP-T18-09	2623679.60	511321.38	55	1116.73	70	URS MARCH 06
GP-T18-10	2624021.32	511626.93	55	1114.11	7	URS MARCH 06
GP-T18-11	2624630.07	512302.10	50	1112.30	1	URS MARCH 06
GP-T18-12	2625275.87	513015.47	40	1101.97	ND	URS MARCH 06
GP-T19-01	2622762.92	507534.43	65	1097.67	ND	URS MARCH 06
GP-T19-02	2623161.29	507839.29	65	1097.57	ND	URS MARCH 06
GP-T19-03	2623576.43	508151.70	65	1100.59	200	URS MARCH 06
GP-T19-04	2623950.09	508440.32	60	1104.38	150	URS MARCH 06
GP-T19-05	2624374.55	508771.15	60	1101.16	75	URS MARCH 06
GP-T19-06	2624727.53	509053.26	60	1100.02	2	URS MARCH 06
GP-T19-07	2625143.03	509334.74	65	1099.65	ND	URS MARCH 06
GP-T19-08	2625458.31	509630.56	52	1108.63	ND	URS MARCH 06
GP-T19-09	2625793.52	509964.93	48	1110.55	ND	URS MARCH 06
GP-T19-10	2626216.61	510332.85	46	1101.53	ND	URS MARCH 06
GP-T19-11	2627092.47	510919.85	35	1103.17	ND	URS MARCH 06
GP-T20-01	2623130.50	505463.92	70	1093.29	ND	URS MARCH 06
GP-T20-02	2623536.33	505819.31	65	1096.58	ND	URS MARCH 06
GP-T20-03	2623909.92	506156.47	55	1096.54	ND	URS MARCH 06

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T20-04	2624237.72	506626.64	65	1097.50	243	URS MARCH 06
GP-T20-05	2624645.79	506791.19	55	1105.69	3	URS MARCH 06
GP-T20-06	2625085.73	507062.70	65	1096.27	47	URS MARCH 06
GP-T20-07	2625465.24	507317.68	65	1095.81	59	URS MARCH 06
GP-T20-08	2625859.11	507579.81	67	1092.40	3	URS MARCH 06
GP-T20-09	2626355.84	507906.86	68	1096.08	ND	URS MARCH 06
GP-T20-10	2626762.96	508238.88	55	1106.57	ND	URS MARCH 06
GP-T20-11	2627149.06	508559.68	73	1081.15	4	URS MARCH 06
GP-T20-13	2628017.96	509096.70	35	1087.74	ND	URS MARCH 06
GP-T20-14	2628408.81	509356.14	53	1093.01	ND	URS MARCH 06
GP-T21-01	2630721.19	505245.84	65	1076.80	ND	URS MARCH 06
GP-T21-02	2631110.35	505824.13	55	1087.01	5	URS MARCH 06
GP-T21-03	2631437.38	506054.57	55	1085.55	ND	URS MARCH 06
GP-T21-04	2631674.45	506273.77	65	1075.58	ND	URS MARCH 06
GP-T22-01	2631531.82	504375.77	56	1084.16	27	URS MARCH 06
GP-T22-02	2631979.58	504870.52	56	1085.52	ND	URS MARCH 06
GP-T22-03	2631945.48	505446.22	58	1085.53	6	URS MARCH 06
GP-T22-04	2632383.92	505672.31	55	1082.45	ND	URS MARCH 06
GP-T23-01	2633127.12	503142.90	33	1071.10	16	URS MARCH 06
GP-T23-02	2633201.40	503711.37	32	1071.72	12	URS MARCH 06
GP-T23-03	2633324.90	504359.25	24	1077.68	ND	URS MARCH 06
GP-T23-04	2633152.01	504676.61	44	1078.73	ND	URS MARCH 06
GP-T24-01	2635695.15	504124.17	24	1061.70	ND	URS MARCH 06
GP-T24-02	2635954.01	504502.99	24	1063.56	ND	URS MARCH 06
GP-T25-01	2635697.46	501884.99	24	1061.05	13	URS MARCH 06
GP-T25-02	2636032.58	502542.12	24	1064.26	ND	URS MARCH 06
GP-T25-03	2636333.75	502908.74	24	1062.06	ND	URS MARCH 06
GP-T26-01	2636851.73	500854.84	24	1056.77	ND	URS MARCH 06
GP-T26-02	2637375.90	500908.70	24	1058.35	ND	URS MARCH 06
GP-T27-01	2636047.90	498418.21	24	1053.61	9.5	URS MARCH 06
GP-T27-02	2636546.24	498454.01	20	1059.66	2	URS MARCH 06
GP-T27-03	2637038.44	498491.20	24	1054.33	ND	URS MARCH 06
GP-T27-04	2637547.06	498517.46	20	1059.50	ND	URS MARCH 06
GP-T28-01	2635337.39	496493.97	24	1052.45	28	URS MARCH 06
GP-T28-02	2635802.17	496520.77	24	1052.90	4	URS MARCH 06
GP-T28-03	2636263.90	496550.58	20	1056.70	4	URS MARCH 06
GP-T28-04	2636661.94	496588.86	20	1057.89	ND	URS MARCH 06
GP-T29-01	2633707.79	495506.60	20	1055.28	ND	URS MARCH 06
GP-T29-02	2634211.40	495499.29	20	1054.49	ND	URS MARCH 06
GP-T29-03	2634704.08	495492.66	20	1054.99	ND	URS MARCH 06
GP-T29-04	2635234.19	495494.67	24	1052.84	12	URS MARCH 06
GP-T29-05	2635611.90	495523.59	20	1056.19	4	URS MARCH 06
GP-T29-06	2636034.15	495540.61	20	1056.47	2	URS MARCH 06
GP-T29-07	2636466.64	495559.57	20	1057.42	ND	URS MARCH 06
GP-T30-01	2634228.37	494135.83	20	1053.83	ND	URS MARCH 06
GP-T30-02	2634667.79	494124.94	20	1056.18	ND	URS MARCH 06
GP-T30-03	2635525.68	494162.10	20	1056.06	ND	URS MARCH 06

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T30-04	2635930.21	494180.38	20	1056.54	2	URS MARCH 06
NL1-DP01	2606516.31	507527.42	44	1125.83	38	UNL JAN-06
NL2-DP01	2611869.37	507668.32	44	1129.36	ND	UNL JAN-06
MW-01B	2618469.56	511743.23			ND	GMP JUN-95
MW-02B	2606808.90	506255.48			5.46	GMP SEP-03
MW-03B	2607542.05	506225.42			ND	GMP JUN-95
MW-04B	2612051.44	506259.36			ND	GMP MAY-93
MW-05B	2613053.87	507097.47			ND	GMP JUN-95
MW-06B	2617384.61	506525.48			ND	GMP JUN-93
MW-07B	2618276.53	507276.12			ND	GMP JUN-93
MW-08B	2622872.08	506820.56			ND	GMP JUN-95
MW-09B	2623580.33	507436.09			235	GMP MAR-06
MW-10B	2607893.74	496858.92			ND	GMP MAR-06
MW-11	2626486.32	509499.80			ND	GMP MAR-06
MW-12	2606856.25	509013.88			18	GMP JUN-95
MW-13	2612231.38	509178.55			ND	GMP JUN-93
MW-14	2617504.71	509391.07			ND	GMP JUN-95
MW-15	2622745.33	509482.90			ND	GMP JUN-95
MW-16C	2604917.63	514034.74			ND	GMP MAY-93
MW-17C	2603293.48	499090.31			ND	GMP SEP-04
MW-18C	2629148.53	506821.93			25.5	GMP MAR-06
MW-19C	2618426.14	517568.83			ND	GMP JUL-97
MW-20C	2616611.43	493187.61			0.71	GMP SEP-03
MW-21B	2607111.29	503524.05			70.2	GMP MAR-06
MW-22B	2606604.48	510403.43			ND	GMP JUN-95
MW-23B	2606393.06	509383.87			3.39	GMP SEP-03
MW-24B	2608477.73	501909.01			160	GMP MAR-06
MW-25B	2608308.27	504885.58			2.53	GMP MAR-03
MW-26B	2609849.90	508824.87			ND	GMP MAY-93
MW-27B	2611427.01	508110.55			ND	GMP MAY-93
MW-28B	2612936.01	502242.26			ND	GMP SEP-04
MW-29B	2614460.98	498382.37			ND	GMP MAR-06
MW-30B	2616281.84	507065.86			ND	GMP JUN-93
MW-31B	2617935.17	503238.63			ND	GMP SEP-04
MW-32B	2619696.91	499069.08			ND	GMP MAR-06
MW-33B	2622401.05	502854.78			1.7	GMP MAR-05
MW-34B	2624443.06	498814.11			ND	GMP MAR-06
MW-35B	2629595.84	496329.37			ND	GMP SEP-04
MW-36B	2634805.75	496692.86			29.8	GMP MAR-06
MW-37B	2633416.51	491631.65			ND	GMP MAR-06
MW-40B	2623006.75	511962.76			170	GMP MAY-04
MW-41B	2624361.83	512001.37			ND	GMP MAR-06
MW-42B	2629385.28	501592.64			ND	GMP MAR-06
MW-43B	2629244.24	504328.20			9.88	GMP MAR-06
MW-44B	2632954.90	500426.32			19.8	GMP MAR-06
MW-45B	2635053.92	499241.15			17.4	GMP MAR-06
MW-46B	2637464.42	499396.68			ND	GMP MAR-06
MW-47B	2603819.42	524480.21			ND	GMP JUL-97
MW-48B (Abandoned)	2607442.66	519367.88			ND	GMP DEC-00
MW-52B	2627004.24	508778.94			0.51	UNL-FEB-06

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
MW-53B	2627885.40	508166.61			24	UNL-FEB-06
MW-54B	2627883.88	508855.98			ND	GMP MAR-06
MW-55B	2628125.88	508374.22			ND	UNL-FEB-06
MW-56B	2628195.32	508217.29			ND	UNL-FEB-06
MW-57B	2607621.51	516363.44			ND	GMP DEC-94
MW-58B (Abandoned)	2620346.02	515009.76			17.0	GMP DEC-00
MW-59B (Abandoned)	2621700.91	515887.73			ND	GMP DEC-00
MW-60B	2624703.22	489598.70			ND	GMP SEP-04
MW-61B	2608644.38	492898.60			ND	GMP MAR-06
MW-62B	2635385.06	493871.95			ND	GMP MAR-06
MW-64B	2628038.55	510106.02			ND	GMP JUL-97
MW-72B	2622921.73	512064.19			5400	GCW JUN-05
MW-73B	2623052.30	511908.70			56	GCW JUN-05
MW-74B	2623085.26	511934.80			140	GCW MAR-01
MW-75B	2623120.34	511961.81			1900	GCW MAR-01
MW-76B	2623148.91	511982.59			480	GCW MAR-01
MW-77B	2623180.56	512007.28			560	GCW MAR-01
MW-78B	2623213.77	512031.30			300	GCW MAR-01
MW-79B	2610428.14	492345.18			2.39	GMP MAR-06
MW-80B	2610916.24	492064.59			18	GMP MAR-06
MW-81B	2611635.91	492360.36			ND	GMP MAR-06
MW-82B	2619284.94	493325.47			ND	GMP MAR-06
MW-83B	2621921.79	495302.77			ND	GMP MAR-06
MW-84B	2624272.04	495712.90			ND	GMP MAR-06
MW-85B	2628315.15	494449.81			ND	GMP MAR-06
MW-89B	2610408.69	494254.10			0.91	GMP MAR-06
MW-90B	2611226.60	494297.96			14.9	GMP MAR-06
MW-91B	2612067.85	494317.53			ND	GMP MAR-06
MW-92B	2610047.80	492733.82			ND	GMP MAR-06
MW-93B	2612154.07	493546.80			ND	GMP MAR-06
NLF-MW01S	2627482.80	508537.55			ND	UNL FEB-06
NLF-MW02S	2627651.96	508654.32			7.1	UNL FEB-06
NLF-MW03S	2627718.61	508563.28			2.5	UNL FEB-06
NLF-MW04S	2627719.69	508471.47			18	UNL FEB-06
NLF-MW05S	2627687.94	508382.55			1.9	UNL FEB-06
NLF-MW06S	2627629.12	508365.46			0.56	UNL FEB-06
NLF-MW07S	2627553.24	508403.93			ND	UNL FEB-06
NPR-MW01S	2626816.17	504709.21			560	UNL FEB-06
NPR-MW02S	2626883.56	504555.87			680	UNL FEB-06
DP-78-1	2610129.15	492268.53	11	1089.42	ND	ECC JUNE 04
DP-78-2	2610159.24	492014.82	11	1090.45	ND	ECC JUNE 04
DP-79-1	2610502.78	492279.38	44	1057.11	2.8	ECC JUNE 04
DP-79-2	2610594.92	492140.15	11	1090.24	3.6	ECC JUNE 04
DP-79-3	2610681.16	492035.13	43	1057.53	5	ECC JUNE 04
DP-79-4	2610736.68	491821.50	11	1090.37	ND	ECC JUNE 04
DP-80-2	2610856.75	492241.60	42	1060.11	27	ECC JUNE 04
DP-80-3	2610934.75	492082.32	42	1058.44	3.3	ECC JUNE 04
DP-80-4	2611018.55	491908.82	17	1083.46	1.1	ECC JUNE 04
DP-81-1	2611193.13	492277.90	12	1090.54	ND	ECC JUNE 04
DP-81-2	2611331.06	492116.13	12	1089.56	ND	ECC JUNE 04

Table 3-3
TCE in Shallow Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
DP-81-3	2611405.99	491993.92	12	1089.19	ND	ECC JUNE 04
DP-82-1	2619171.52	493174.18	63	1087.49	ND	ECC JUNE 04
DP-82-2	2619225.33	493005.06	63	1087.99	ND	ECC JUNE 04
DP-83-1	2621916.18	495259.48	70	1080.44	ND	ECC JUNE 04
DP-83-2	2621983.52	495163.83	68	1082.44	ND	ECC JUNE 04
DP-84-1	2624254.30	495702.39	67	1076.63	ND	ECC JUNE 04
DP-84-2	2624352.62	495524.18	67	1080.98	ND	ECC JUNE 04
DP-85-1	2628364.68	494414.53	64	1066.44	ND	ECC JUNE 04
DP-85-2	2628467.72	494123.52	52	1080.37	ND	ECC JUNE 04
DP-86-1	2631988.92	493956.51	28	1078.13	ND	ECC JUNE 04
DP-86-2	2632105.26	494008.75	27	1079.89	ND	ECC JUNE 04
DP-87-1	2635425.10	486859.84	10	1060.24	ND	ECC JUNE 04
DP-87-2	2635229.37	492134.11	10	1066.51	ND	ECC JUNE 04
DP-88-1	2637614.82	494016.68	10	1074.84	ND	ECC JUNE 04

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
CU-01	2607366.14	506814.94			ND	GMP JUN-96
CU-02	2606572.16	503260.40			ND	GMP JUN-96
CU-03	2608970.75	497263.84			ND	GMP JUN-96
CU-04	2608896.84	496799.89			ND	GMP JUN-01
CU-05	2608553.23	495506.84			ND	GMP JUN-96
CU-06	2610792.37	509337.77			ND	GMP JUN-96
CU-07	2611883.90	509417.04			ND	GMP JUL-99
CU-08	2612786.92	508535.14			ND	GMP JUN-96
CU-09	2610586.65	499876.06			ND	GMP JUN-96
CU-10	2605708.95	500244.02			ND	GMP JUN-96
CU-11	2607638.20	505704.78			ND	GMP JUN-01
CU-12	2604614.02	497524.05			ND	GMP JUN-01
CU-13	2609168.13	496683.63			ND	GMP JUN-01
CU-14	2609142.15	495938.85			ND	GMP JUN-96
CU-15	2608825.36	494386.47			ND	GMP JUN-96
CU-17	2611895.55	509182.49			ND	GMP JUN-96
CU-18	2611773.60	509110.35			ND	GMP JUN-96
CU-19	2612683.25	507157.48			ND	GMP JUN-96
CU-20	2612755.47	507025.32			ND	GMP JUN-96
CU-21	2617125.86	509520.51			ND	GMP JUN-96
CU-22	2618057.69	507282.18			ND	GMP JUL-96
CU-23	2626875.34	504796.33			570	GMP JUN-01
CU-24	2616148.95	495448.35			ND	GMP JUN-96
CU-25	2622666.85	507453.20			ND	GMP JUN-96
UNFL-11A	2608084.08	505573.16			ND	GMP SEP-00
UNFL-8A	2618495.01	506249.95			ND	GMP MAR-99
UNFL-S-8	2609860.25	499863.95			ND	GMP DEC-93
G-096589(IR-15)	2625428.46	502779.58			ND	GMP JUL-97
G-105800(IR-20)	2609634.81	504937.27			ND	GMP SEP-94
G-096584(IR-21)	2609425.47	507511.90			ND	GMP SEP-94
UNFL-IR-4	2619793.86	506293.50			ND	GMP JUL-99
G-033754(IR-7)	2627929.44	506174.88			64	GMP JUN-94
G-036213(IR-13)	2628061.43	502884.05			4	GMP JUN-94
GP-01	2609183.72	500357.30	97	1063.86	6679.8	URS APRIL 02
GP-02	2608589.56	499995.40	120	1048.56	49.8	URS APRIL 02
GP-03	2609173.86	499538.94	130	1031.57	888.6	URS APRIL 02
GP-04	2609727.82	500003.76	120	1047.70	1458.9	URS APRIL 02
GP-05	2609125.62	501023.73	97	1062.72	4873.6	URS APRIL 02
GP-06	2608947.82	500707.13	95	1065.27	38	URS APRIL 02
GP-07	2609234.94	498105.80	140	1026.71	2.7	URS APRIL 02
GP-08	2610081.52	498123.45	120	1043.22	627.4	URS APRIL 02
GP-09	2610347.80	496942.73	97	1062.74	5.8	URS APRIL 02
GP-10	2609256.60	502858.88	97	1070.93	8	URS APRIL 02
GP-11	2609128.62	501626.76	97	1065.90	24499.9	URS APRIL 02
GP-12	2609158.71	502145.28	97	1064.83	3015.7	URS APRIL 02
GP-13	2608814.98	501464.63	120	1040.48	114	URS APRIL 02
GP-14	2610493.31	500051.92	120	1047.59	ND	URS APRIL 02
GP-15	2610340.45	501453.43	100	1068.50	ND	URS APRIL 02
GP-16	2609556.26	501620.62	97	1065.71	740.6	URS APRIL 02
GP-17	2608546.48	502735.05	97	1065.18	7984.5	URS APRIL 02

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-18	2611021.03	498143.52	97	1068.32	9.8	URS APRIL 02
GP-19	2608403.18	503617.18	130	1047.54	8002.4	URS APRIL 02
GP-20	2607973.36	504537.76	130	1046.57	55.6	URS APRIL 02
GP-21	2608785.68	503586.85	130	1047.90	3.7	URS APRIL 02
GP-22	2608093.72	503828.42	100	1072.41	6647.8	URS APRIL 02
GP-23	2607751.12	504328.03	110	1060.04	20507.9	URS APRIL 02
GP-24	2607299.60	506024.73	100	1077.51	ND	URS APRIL 02
GP-25	2606419.74	505931.58	100	1068.96	5678.9	URS APRIL 02
GP-26	2606115.97	506360.90	100	1067.45	6034.8	URS APRIL 02
GP-26(GCW)	2623173.86	511393.78	90	1078.43	44	URS APRIL 01
GP-27	2605658.96	507151.12	100	1069.55	ND	URS APRIL 02
GP-28	2605668.14	506608.63	100	1066.52	ND	URS APRIL 02
GP-28(GCW)	2623734.63	509926.23	90	1077.34	27	URS APRIL 01
GP-29	2606185.75	507076.35	100	1072.27	2917.1	URS APRIL 02
GP-30	2605605.21	506900.91	100	1067.46	ND	URS APRIL 02
GP-31	2606120.58	507970.94	100	1071.76	2716.3	URS APRIL 02
GP-32	2611753.31	497146.34	97	1061.50	ND	URS APRIL 02
GP-33	2606868.92	507318.23	100	1070.87	ND	URS APRIL 02
GP-33(GCW)	2626948.30	504628.67	90	1059.34	440	URS APRIL 02
GP-34	2606029.16	505631.93	100	1065.30	ND	URS APRIL 02
GP-35	2609444.20	496866.70	120	1038.03	14.6	URS APRIL 02
GP-35(GCW)	2625041.53	506684.79	86	1071.43	110	URS APRIL 01
GP-36	2606115.85	508407.31	100	1077.51	613.3	URS APRIL 02
GP-37	2608712.06	495517.83	97	1060.31	ND	URS MARCH 03
GP-37(GCW)	2626589.03	504771.30	90	1060.47	523	URS APRIL 01
GP-38	2609206.03	495527.71	120	1033.55	ND	URS MARCH 03
GP-38(GCW)	2627087.99	504131.36	90	1059.39	270	URS APRIL 01
GP-39	2610319.40	495566.35	97	1057.07	139	URS MARCH 03
GP-40	2610876.37	495589.14	120	1100.41	ND	URS MARCH 03
GP-41	2611433.40	495608.37	107	1053.55	ND	URS MARCH 03
GP-43	2609256.06	494565.93	97	1051.85	ND	URS MARCH 03
GP-44	2610450.05	494236.48	120	1038.31	ND	URS MARCH 03
GP-45	2611001.26	494249.27	97	1049.38	3.7	URS MARCH 03
GP-45(GCW)	2623295.20	511792.88	90	1078.11	4	URS APRIL 01
GP-54	2610553.80	493754.99	97	1049.91	14.2	URS MARCH 03
GP-55	2606037.34	504655.77	105	1061.79	ND	URS MARCH 03
GP-56	2606572.18	502348.91	97	1070.84	ND	URS MARCH 03
GP-57	2607152.32	498727.01	97	1058.70	ND	URS MARCH 03
GP-58	2609289.31	501675.87	97	1067.51	15000	URS MARCH 03
GP-59	2608938.41	501562.06	97	1063.73	1100	URS MARCH 03
GP-60	2609001.61	501849.32	97	1064.30	14000	URS MARCH 03
GP-72	2610629.30	493369.10	70	1049.91	3	URS MARCH 03
GP-73	2609229.36	501403.74	97	1065.28	23000	URS MARCH 03
GP-74	2607626.63	504564.23	105	1067.13	9300	URS MARCH 03
GP-75	2607874.53	504076.86	105	1069.08	7690	URS MARCH 03
GP-76	2607952.68	504315.54	105	1067.64	8400	URS MARCH 03
GP-77	2607556.15	504279.37	105	1063.25	27000	URS MARCH 03
GP-78	2608714.41	502842.54	97	1066.86	6000	URS MARCH 03
GP-79	2608341.48	502608.81	102	1063.57	5400	URS MARCH 03
GP-80	2608209.09	502522.71	102	1064.78	210	URS MARCH 03

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-81	2608882.77	502951.42	102	1066.82	270	URS MARCH 03
GP-82	2608850.01	501710.45	97	1063.08	410	URS MARCH 03
GP-83	2609200.64	501905.80	97	1064.96	16500	URS MARCH 03
GP-86	2607408.68	505025.91	100	1073.23	6400	URS MARCH 03
GP-87	2610681.40	493090.45	65	1040.02	ND	URS MARCH 03
GP-88	2611678.07	493087.29	70	1038.73	ND	URS MARCH 03
GP-89	2609677.43	493047.38	65	1042.00	ND	URS MARCH 03
GP-90	2610179.55	493020.78	65	1040.59	ND	URS MARCH 03
GP-91	2611098.48	493089.40	65	1040.51	ND	URS MARCH 03
GP-92	2607906.48	504711.56	102	1070.35	6	URS MARCH 03
GP-93	2607490.26	504493.41	102	1068.53	40000	URS MARCH 03
GP-94	2607378.56	504820.72	100	1070.14	18000	URS MARCH 03
GP-95	2606552.58	508581.28	100	1072.99	11	URS MARCH 03
GP-96	2606178.25	508589.14	100	1080.42	230	URS MARCH 03
GP-97	2605921.74	508596.42	100	1075.01	ND	URS MARCH 03
GP-98	2606075.21	509008.97	100	1075.01	7	URS MARCH 03
GP-99	2606277.13	509615.63	70	1103.67	ND	URS MARCH 03
GP-100	2607359.69	504233.90	102	1062.40	29000	URS MARCH 03
GP-101	2605955.67	507166.35	100	1068.46	3800	URS MARCH 03
GP-102	2605797.44	508032.31	100	1070.18	ND	URS MARCH 03
GP-103	2607205.14	505104.19	100	1069.06	23000	URS MARCH 03
GP-104	2605846.41	507335.61	100	1066.91	2	URS MARCH 03
GP-105	2605712.78	507628.16	100	1072.22	ND	URS MARCH 03
GP-106	2608209.21	503382.62	100	1072.55	18000	URS MARCH 03
GP-107	2606000.97	506873.62	100	1068.27	670	URS MARCH 03
GP-108	2606947.91	505620.31	100	1067.28	2300	URS MARCH 03
GP-109	2610440.12	492595.48	65	1040.36	2	URS JAN 06
GP-110	2611127.59	492617.04	85	1019.13	6	URS JAN 06
GP-111	2611628.21	492632.42	65	1040.87	ND	URS JAN 06
GP-112	2610157.66	492447.41	65	1040.81	ND	URS JAN 06
GP-113	2610856.15	492472.63	65	1038.87	34	URS JAN 06
GP-114	2611422.79	492492.64	65	1038.32	ND	URS JAN 06
GP-115	2610824.29	492224.62	65	1039.45	21	URS JAN 06
GP-116	2610579.55	492289.59	65	1040.59	2	URS JAN 06
GP-117	2611209.46	492239.94	64	1039.19	ND	URS JAN 06
GP-118	2610808.42	492036.60	83	1021.48	3	URS JAN 06
GP-119	2611360.67	492016.22	65	1038.82	ND	URS JAN 06
GP-120	2610403.69	492124.08	65	1041.10	2	URS JAN 06
GP-121	2610169.33	491985.87	65	1040.53	1	URS JAN 06
GP-122	2610705.39	491897.78	65	1041.46	1	URS JAN 06
GP-123	2611010.12	491841.51	65	1039.95	ND	URS JAN 06
GP-124	2611329.89	491860.03	65	1039.69	ND	URS JAN 06
GP-125	2610235.81	491778.31	65	1040.24	2	URS JAN 06
GP-126	2611496.91	491738.69	82	1022.70	ND	URS JAN 06
GP-127	2610302.39	491567.67	83	1023.98	ND	URS JAN 06
GP-128	2610777.19	491577.18	85	1021.17	ND	URS JAN 06
GP-129	2611241.73	491591.47	84	1019.95	ND	URS JAN 06
GP-T01-01	2632681.21	496434.55	45	1041.59	22	URS OCT/NOV 05
GP-T01-02	2633251.01	496458.10	37	1039.90	4	URS OCT/NOV 05
GP-T01-03	2633771.81	496481.16	39	1037.06	2	URS OCT/NOV 05

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T01-04	2634313.24	496504.50	37	1039.40	2	URS OCT/NOV 05
GP-T01-05	2634849.94	496524.80	38	1039.13	16	URS OCT/NOV 05
GP-T01-06	2635320.02	497568.18	40	1037.30	43	URS OCT/NOV 05
GP-T01-07	2635864.11	497577.28	35	1043.42	16	URS OCT/NOV 05
GP-T01-08	2636625.08	497586.99	34	1045.49	4	URS OCT/NOV 05
GP-T01-09	2637577.58	497601.16	44	1035.27	ND	URS OCT/NOV 05
GP-T01-10	2638535.39	497630.83	36	1042.55	ND	URS OCT/NOV 05
GP-T01-11	2632960.20	496450.10	39	1040.98	ND	URS OCT/NOV 05
GP-T01-12	2634586.09	496513.29	40	1036.22	ND	URS OCT/NOV 05
GP-T01-13	2634984.72	497565.75	35	1041.61	20	URS OCT/NOV 05
GP-T01-14	2635569.64	497573.68	41	1036.29	34	URS OCT/NOV 05
GP-T01-15	2637096.19	497593.80	45	1033.09	ND	URS OCT/NOV 05
GP-T01-16	2638101.76	497617.88	46	1032.72	ND	URS OCT/NOV 05
GP-T01-17	2632680.74	496431.67	45	1041.79	ND	URS MARCH 06
GP-T01-18	2632724.99	496201.53	43	1040.63	ND	URS MARCH 06
GP-T01-19	2632978.92	496215.56	38	1040.93	ND	URS MARCH 06
GP-T02-01	2629114.49	500712.78	95	1045.17	2	URS OCT/NOV 05
GP-T02-02	2629350.26	501091.42	75	1062.68	1	URS OCT/NOV 05
GP-T02-03	2629429.55	501269.68	93	1044.61	ND	URS OCT/NOV 05
GP-T02-04	2630828.86	503085.51	89	1049.13	4	URS OCT/NOV 05
GP-T02-05	2631124.11	503944.37	75	1064.44	15	URS OCT/NOV 05
GP-T02-06	2629369.61	501941.94	103	1045.20	26	URS MARCH 06
GP-T02-07	2629364.01	502468.62	100	1044.25	118	URS MARCH 06
GP-T02-08	2629339.51	502902.68	80	1061.29	980	URS MARCH 06
GP-T02-09	2629316.81	503325.08	80	1061.86	55	URS MARCH 06
GP-T03-01	2635350.27	503934.07	34	1053.35	2	URS OCT/NOV 05
GP-T03-02	2635371.58	503380.67	46	1043.27	ND	URS OCT/NOV 05
GP-T03-03	2635389.80	502847.31	34	1053.60	2	URS OCT/NOV 05
GP-T03-04	2635410.29	502342.47	42	1043.38	6	URS OCT/NOV 05
GP-T03-05	2635427.04	501900.87	35	1048.91	38	URS OCT/NOV 05
GP-T03-06	2636186.08	501444.59	34	1048.38	6	URS OCT/NOV 05
GP-T03-07	2636206.56	500902.04	35	1045.81	17	URS OCT/NOV 05
GP-T03-08	2636224.45	500406.06	33	1047.20	17	URS OCT/NOV 05
GP-T03-09	2636242.95	499929.48	31	1048.80	8	URS OCT/NOV 05
GP-T03-10	2635339.17	504171.73	34	1052.76	ND	URS OCT/NOV 05
GP-T03-11	2635329.91	504384.96	45	1042.50	ND	URS OCT/NOV 05
GP-T04-01	2634160.36	503856.96	32	1059.62	2	URS OCT/NOV 05
GP-T04-02	2634160.66	503350.42	35	1053.90	18	URS OCT/NOV 05
GP-T04-03	2634131.53	502789.96	35	1051.20	14	URS OCT/NOV 05
GP-T04-04	2634077.45	502297.00	35	1050.26	92	URS OCT/NOV 05
GP-T04-05	2634029.90	501862.69	40	1044.08	15	URS OCT/NOV 05
GP-T04-06	2633957.20	500315.11	32	1047.64	5	URS OCT/NOV 05
GP-T04-07	2634027.01	499801.15	37	1042.25	4	URS OCT/NOV 05
GP-T04-08	2634160.55	504075.48	48	1044.06	ND	URS OCT/NOV 05
GP-T04-09	2634163.29	504301.79	49	1043.82	ND	URS OCT/NOV 05
GP-T05-01	2632242.02	499455.61	77	1055.59	ND	URS OCT/NOV 05
GP-T05-02	2632696.60	499415.13	50	1046.48	5	URS OCT/NOV 05
GP-T05-03	2633253.16	499455.75	32	1050.33	22	URS OCT/NOV 05
GP-T05-04	2633738.60	499466.33	28	1050.85	102	URS OCT/NOV 05
GP-T05-05	2634196.41	499486.38	28	1051.05	8	URS OCT/NOV 05

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T05-06	2634686.98	499522.54	27	1051.76	11	URS OCT/NOV 05
GP-T05-07	2636339.38	499423.04	42	1036.45	15	URS OCT/NOV 05
GP-T05-08	2637208.11	499445.72	47	1033.18	ND	URS OCT/NOV 05
GP-T05-09	2633965.53	499473.35	26	1052.68	202	URS OCT/NOV 05
GP-T05-11	2636777.05	499433.48	42	1038.64	1	URS OCT/NOV 05
GP-T05-12	2632491.57	499449.68	68	1045.52	2	URS OCT/NOV 05
GP-T09-07	2614375.30	494407.80	95	1057.62	ND	URS OCT/NOV 05
GP-T09-08	2615097.56	494809.43	107	1054.15	ND	URS OCT/NOV 05
GP-T11-05	2622163.30	502497.46	102	1053.22	2	URS OCT/NOV 05
GP-T11-06	2622961.25	503628.20	104	1054.17	ND	URS OCT/NOV 05
GP-T13-01	2628700.20	497327.18	107	1042.60	ND	URS OCT/NOV 05
GP-T13-02	2629346.00	498171.17	79	1051.57	ND	URS OCT/NOV 05
GP-T13-03	2630026.66	499045.68	65	1064.23	ND	URS OCT/NOV 05
GP-T13-04	2629024.71	497772.26	90	1048.11	2	URS OCT/NOV 05
GP-T13-05	2629720.17	498703.20	65	1064.88	ND	URS OCT/NOV 05
GP-T13-10	2632669.14	501518.82	50	1057.97	31	URS MARCH 06
GP-T13-11	2632896.93	501983.37	52	1055.31	7	URS MARCH 06
GP-T13-12	2633148.94	502540.35	41	1053.66	3	URS MARCH 06
GP-T15-01	2628496.78	506829.85	75	1070.98	16	URS OCT/NOV 05
GP-T15-02	2627999.03	506619.55	75	1073.70	0.26	URS OCT/NOV 05
GP-T15-04	2627239.15	506097.58	65	1084.61	3	URS OCT/NOV 05
GP-T15-05	2626665.73	506014.57	74	1082.15	2.7	URS OCT/NOV 05
GP-T15-06	2626380.38	505723.07	70	1082.80	110	URS OCT/NOV 05
GP-T15-07	2625934.53	505456.08	95	1064.03	1200	URS OCT/NOV 05
GP-T15-08	2625432.67	505155.00	95	1056.01	370	URS OCT/NOV 05
GP-T15-09	2625094.66	505054.52	95	1058.14	32	URS OCT/NOV 05
GP-T15-10	2624651.96	504854.01	94	1054.57	ND	URS OCT/NOV 05
GP-T15-11	2624407.59	504630.37	95	1057.99	ND	URS OCT/NOV 05
GP-T15-12	2629132.22	507086.27	50	1069.86	ND	URS OCT/NOV 05
GP-T16-01	2629203.84	505681.43	75	1067.68	43	URS OCT/NOV 05
GP-T16-02	2628726.95	505436.47	95	1047.80	0.96	URS OCT/NOV 05
GP-T16-03	2628171.74	505179.13	95	1048.29	13	URS OCT/NOV 05
GP-T16-04	2627846.86	505023.71	95	1048.81	34	URS OCT/NOV 05
GP-T16-05	2627397.66	504828.56	95	1052.86	230	URS OCT/NOV 05
GP-T16-06	2626989.05	504550.11	75	1071.38	1200	URS OCT/NOV 05
GP-T16-07	2626631.94	504313.44	95	1053.19	870	URS OCT/NOV 05
GP-T16-08	2626243.08	504049.51	93	1052.96	3.7	URS OCT/NOV 05
GP-T16-09	2625847.47	503768.33	91	1054.81	1	URS OCT/NOV 05
GP-T16-10	2625483.25	503511.96	74	1072.74	ND	URS OCT/NOV 05
GP-T16-11	2629677.72	505770.20	80	1062.94	ND	URS MARCH 06
GP-T16-12	2629950.20	506202.03	80	1062.87	ND	URS MARCH 06
GP-T16-13	2630554.48	506691.28	61	1060.86	ND	URS MARCH 06
GP-T17-01	2618955.26	512412.49	83	1090.08	ND	URS MARCH 06
GP-T17-03	2619803.84	513014.44	88	1089.15	ND	URS MARCH 06
GP-T17-04	2620179.87	513293.38	89	1088.97	ND	URS MARCH 06
GP-T18-01	2621318.76	509406.84	86	1084.84	ND	URS MARCH 06
GP-T18-02	2621936.77	509659.12	86	1083.83	0.28	URS MARCH 06
GP-T18-03	2622104.68	510041.28	85	1083.71	150	URS MARCH 06
GP-T18-05	2622933.37	510659.77	109	1059.38	1300	URS MARCH 06

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T18-06	2623130.70	510825.62	85	1083.33	58	URS MARCH 06
GP-T18-07	2623320.39	510995.45	85	1085.94	18	URS MARCH 06
GP-T18-08	2623509.21	511164.97	80	1088.58	216	URS MARCH 06
GP-T18-09	2623679.60	511321.38	79	1092.73	170	URS MARCH 06
GP-T18-10	2624021.32	511626.93	73	1096.11	ND	URS MARCH 06
GP-T18-11	2624630.07	512302.10	67	1095.30	ND	URS MARCH 06
GP-T18-12	2625275.87	513015.47	63	1078.97	ND	URS MARCH 06
GP-T19-01	2622762.92	507534.43	87	1075.67	ND	URS MARCH 06
GP-T19-02	2623161.29	507839.29	112	1050.57	82	URS MARCH 06
GP-T19-03	2623576.43	508151.70	91	1074.59	630	URS MARCH 06
GP-T19-04	2623950.09	508440.32	76	1088.38	250	URS MARCH 06
GP-T19-05	2624374.55	508771.15	65	1096.16	63	URS MARCH 06
GP-T19-06	2624727.53	509053.26	70	1090.02	8	URS MARCH 06
GP-T19-07	2625143.03	509334.74	70	1094.65	ND	URS MARCH 06
GP-T19-11	2627092.47	510919.85	58	1080.17	ND	URS MARCH 06
GP-T20-01	2623130.50	505463.92	91	1072.29	ND	URS MARCH 06
GP-T20-02	2623536.33	505819.31	87	1074.58	ND	URS MARCH 06
GP-T20-03	2623909.92	506156.47	100	1051.54	3	URS MARCH 06
GP-T20-04	2624237.72	506626.64	88	1074.50	2600	URS MARCH 06
GP-T20-05	2624645.79	506791.19	77	1083.69	310	URS MARCH 06
GP-T20-06	2625085.73	507062.70	74	1087.27	190	URS MARCH 06
GP-T20-07	2625465.24	507317.68	70	1090.81	98	URS MARCH 06
GP-T20-08	2625859.11	507579.81	74	1085.40	24	URS MARCH 06
GP-T20-09	2626355.84	507906.86	76	1088.08	ND	URS MARCH 06
GP-T20-11	2627149.06	508559.68	91	1063.15	19	URS MARCH 06
GP-T20-13	2628017.96	509096.70	51	1071.74	ND	URS MARCH 06
GP-T20-14	2628408.81	509356.14	72	1074.01	ND	URS MARCH 06
GP-T21-01	2630721.19	505245.84	81	1060.80	ND	URS MARCH 06
GP-T21-02	2631110.35	505824.13	76	1066.01	1	URS MARCH 06
GP-T21-03	2631437.38	506054.57	75	1065.55	ND	URS MARCH 06
GP-T21-04	2631674.45	506273.77	80	1060.58	ND	URS MARCH 06
GP-T22-01	2631531.82	504375.77	76	1064.16	5	URS MARCH 06
GP-T22-02	2631979.58	504870.52	76	1065.52	ND	URS MARCH 06
GP-T22-04	2632383.92	505672.31	75	1062.45	ND	URS MARCH 06
GP-T23-01	2633127.12	503142.90	50	1054.10	20	URS MARCH 06
GP-T23-02	2633201.40	503711.37	47	1056.72	2	URS MARCH 06
GP-T23-03	2633324.90	504359.25	42	1059.68	ND	URS MARCH 06
GP-T23-04	2633152.01	504676.61	62	1060.73	ND	URS MARCH 06
GP-T24-01	2635695.15	504124.17	34	1051.70	ND	URS MARCH 06
GP-T24-02	2635954.01	504502.99	47	1040.56	ND	URS MARCH 06
GP-T25-01	2635697.46	501884.99	40	1045.05	4	URS MARCH 06
GP-T25-02	2636032.58	502542.12	36	1052.26	ND	URS MARCH 06
GP-T25-03	2636333.75	502908.74	34	1052.06	ND	URS MARCH 06
GP-T26-01	2636851.73	500854.84	36	1044.77	ND	URS MARCH 06
GP-T27-02	2636546.24	498454.01	33	1046.66	9.1	URS MARCH 06
GP-T27-03	2637038.44	498491.20	34	1044.33	ND	URS MARCH 06
GP-T27-04	2637547.06	498517.46	32	1047.50	ND	URS MARCH 06

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
GP-T28-01	2635337.39	496493.97	36	1040.45	21	URS MARCH 06
GP-T28-03	2636263.90	496550.58	31	1045.70	6	URS MARCH 06
GP-T28-04	2636661.94	496588.86	31	1046.89	0.38	URS MARCH 06
GP-T29-01	2633707.79	495506.60	36	1039.28	ND	URS MARCH 06
GP-T29-02	2634211.40	495499.29	30	1044.49	ND	URS MARCH 06
GP-T29-03	2634704.08	495492.66	32	1042.99	ND	URS MARCH 06
GP-T29-04	2635234.19	495494.67	32	1044.84	17	URS MARCH 06
GP-T29-05	2635611.90	495523.59	31	1045.19	6	URS MARCH 06
GP-T29-06	2636034.15	495540.61	32	1044.47	4	URS MARCH 06
GP-T29-07	2636466.64	495559.57	32	1045.42	ND	URS MARCH 06
GP-T30-01	2634228.37	494135.83	28	1045.83	ND	URS MARCH 06
GP-T30-02	2634667.79	494124.94	30	1046.18	ND	URS MARCH 06
GP-T30-03	2635525.68	494162.10	31	1045.06	ND	URS MARCH 06
GP-T30-04	2635930.21	494180.38	30	1046.54	ND	URS MARCH 06
MW-01A	2618459.72	511743.03			ND	GMP JUN-95
MW-02A	2606800.10	506250.32			12.8	GMP SEP-03
MW-03A	2607532.26	506223.42			ND	GMP JUN-95
MW-04A	2612041.94	506256.77			ND	GMP MAY-93
MW-05A	2613044.09	507097.63			1.83	GMP SEP-03
MW-06A	2617375.69	506522.12			ND	GMP JUN-93
MW-07A	2618267.10	507274.83			ND	GMP JUN-93
MW-08A	2622863.97	506814.76			0.6	GMP JUN-95
MW-09A	2623570.81	507435.84			752	GMP MAR-06
MW-10A	2607883.83	496858.27			ND	GMP MAR-06
MW-16B	2604911.66	514026.38			ND	GMP MAY-93
MW-17B	2603293.03	499101.48			ND	GMP MAR-05
MW-18B	2629156.57	506827.46			ND	GMP MAR-06
MW-19B	2618429.63	517576.97			ND	GMP MAR-06
MW-20B	2616633.43	493191.47			ND	GMP MAR-06
MW-21A	2607121.37	503524.81			32.2	GMP MAR-06
MW-22A	2606598.39	510402.07			ND	GMP JUN-95
MW-23A	2606402.57	509376.37			ND	GMP MAR-03
MW-24A	2608476.90	501919.83			462	GMP MAR-06
MW-25A	2608308.41	504875.16			ND	GMP MAR-03
MW-26A	2609860.44	508825.09			ND	GMP MAY-93
MW-27A	2611434.64	508103.04			ND	GMP MAY-93
MW-28A	2612951.02	502242.71			ND	GMP SEP-04
MW-29A	2614469.84	498383.11			ND	GMP MAR-06
MW-30A	2616288.05	507064.55			ND	GMP JUN-93
MW-31A	2617943.95	503233.70			ND	GMP SEP-04
MW-32A	2619697.25	499062.26			ND	GMP MAR-06
MW-33A	2622410.84	502847.91			1.1	GMP MAR-05
MW-34A	2624442.78	498806.30			ND	GMP MAR-06
MW-35A	2629595.76	496323.64			ND	GMP SEP-04
MW-36A	2634814.84	496694.95			35	GMP MAR-06
MW-37A	2633418.32	491651.94			ND	GMP MAR-06
MW-38A	2638131.88	496248.57			ND	GMP MAR-06
MW-39A	2640060.00	499307.00			ND	GMP MAR-06
MW-40A	2623018.62	511963.35			12	GMP DEC-99

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
MW-41A	2624371.47	512001.33			ND	GMP MAR-06
MW-42A	2629385.20	501582.56			2.29	GMP MAR-06
MW-43A	2629243.07	504317.91			27.4	GMP MAR-06
MW-44A	2632953.68	500415.12			682	GMP MAR-06
MW-45A	2635043.54	499241.12			13.5	GMP MAR-06
MW-46A	2637464.94	499387.37			ND	GMP MAR-06
MW-47A	2603834.71	524480.73			ND	GMP JUL-97
MW-48A (Abandoned)	2607436.75	519363.04			0.95	GMP DEC-00
MW-52A	2627012.55	508784.57			0.56	UNL FEB-06
MW-53A	2627897.77	508169.88			0.71	UNL FEB-06
MW-54A	2627893.82	508858.25			ND	GMP MAR-06
MW-55A	2628135.40	508377.66			ND	UNL FEB-06
MW-56A	2628206.01	508215.32			ND	UNL FEB-06
MW-58A (Abandoned)	2620357.49	515008.03			ND	GMP DEC-00
MW-59A (Abandoned)	2621708.41	515882.45			5.9	GMP DEC-00
MW-60A	2624702.83	489585.15			ND	GMP SEP-04
MW-61A	2608656.02	492900.05			ND	GMP MAR-06
MW-62A	2635396.62	493874.24			ND	GMP MAR-06
MW 72A	2622930.98	512064.69			34	GCW JUN-05
MW 73A	2623060.93	511909.15			51	GCW JUN-05
MW 74A	2623093.85	511934.84			55	GCW MAR-01
MW 75A	2623130.00	511962.35			28	GCW MAR-01
MW 76A	2623158.64	511983.32			7.2	GCW MAR-01
MW 77A	2623192.11	512008.01			4.1	GCW MAR-01
MW 78A	2623223.84	512032.75			3.2	GCW MAR-01
MW-79A	2610432.14	492336.21			ND	GMP MAR-06
MW-80A	2610925.54	492067.12			17.5	GMP MAR-06
MW-81A	2611637.99	492369.38			ND	GMP MAR-06
MW-82A	2619288.65	493318.05			ND	GMP MAR-06
MW-83A	2621924.08	495274.66			ND	GMP MAR-06
MW-84A	2624277.77	495685.51			ND	GMP MAR-06
MW-85A	2628326.53	494439.02			ND	GMP MAR-06
MW-89A	2610430.84	494253.88			0.74	GMP MAR-06
MW-90A	2611235.54	494302.04			17.9	GMP MAR-06
MW-91A	2612076.97	494323.00			ND	GMP MAR-06
MW-92A	2610047.26	492722.58			ND	GMP MAR-06
MW-93A	2612162.89	493551.29			ND	GMP MAR-06
TH-EW-12	2610738.32	493102.14			31.7	ECC JUL-05
TH-EW-13	2611511.12	493072.65			ND	ECC JUL-05
NLF-MW01I	2627492.64	508537.67			6.4	UNL FEB-06
NLF-MW02I	2627655.27	508651.08			150	UNL FEB-06
NLF-MW03I	2627718.46	508576.40			41	UNL FEB-06
NLF-MW04I	2627719.58	508481.31			42	UNL FEB-06
NLF-MW05I	2627691.34	508372.75			15	UNL FEB-06
NLF-MW06I	2627639.03	508359.02			3.3	UNL FEB-06
NLF-MW07I	2627559.79	508404.00			1.8	UNL FEB-06
NPR-MW01I	2626822.73	504709.28			940	UNL FEB-06
NPR-MW02I	2626890.12	504555.94			1100	UNL FEB-06
27	2633476.40	491304.43			ND	GMP SEP-05
29	2632729.38	493681.28			ND	GMP MAR-06

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
29A	2632534.17	494638.66			ND	GMP MAR-06
32	2629716.51	491666.47			ND	GMP SEP-05
34	2626827.64	493316.85			ND	GMP SEP-05
50A	2632370.18	495129.55			ND	GMP MAR-06
50B	2632436.85	496066.20			ND	GMP MAR-06
51	2632597.38	497396.03			ND	GMP MAR-06
51A	2632668.59	498157.95			0.21	GMP MAR-06
52A	2629661.43	497364.74			ND	GMP MAR-06
52B	2632545.34	496922.53			ND	GMP MAR-06
52C	2632544.44	500793.18			578	GMP MAR-06
53	2632924.12	501634.04			4.41	GMP MAR-06
54	2632993.96	502739.60			11.70	GMP MAR-06
55	2636183.31	502038.33			ND	GMP MAR-06
56	2633338.89	504808.40			ND	GMP MAR-06
57	2631644.43	506139.34			ND	GMP MAR-06
58	2629341.33	508353.25			ND	GMP MAR-06
59	2632183.18	505741.87			ND	GMP MAR-06
60	2632265.13	507014.18			ND	GMP MAR-06
61	2633336.15	505318.68			ND	GMP MAR-06
62	2633672.26	506287.24			ND	GMP MAR-06
63	2634067.41	508770.05			ND	GMP SEP-05
64	2634157.44	508043.59			ND	GMP SEP-05
65	2614593.55	491678.09			ND	GMP MAR-06
66	2616208.81	492370.65			ND	GMP MAR-06
67	2616890.53	492515.37			ND	GMP MAR-06
68	2618614.53	492940.88			ND	GMP MAR-06
73	2640113.88	495421.71			ND	GMP OCT-05
74	2640476.82	495423.94			ND	GMP OCT-05
75	2638731.57	494855.11			ND	GMP OCT-05
76	2639193.09	494923.60			ND	GMP SEP-05
77	2639589.02	494926.03			ND	GMP OCT-05
79	2640347.90	494930.69			ND	GMP OCT-05
80	2623649.46	517204.54			ND	GMP SEP-05
81	2628563.41	515053.61			ND	GMP SEP-05
82	2624565.27	515713.36			ND	GMP SEP-05
84	2634199.43	510931.36			ND	GMP SEP-05
86	2638562.12	495576.34			ND	GMP OCT-05
87	2639967.28	497784.61			ND	GMP OCT-05
89	2629391.51	509369.67			ND	GMP MAR-06
90	2634812.02	507983.47			ND	GMP OCT-05
91	2634845.47	505424.35			ND	GMP MAR-06
92	2634909.73	504759.87			ND	GMP MAR-06
93	2638763.34	504473.33			ND	GMP SEP-05
94	2638643.45	504490.04			ND	GMP SEP-05
95	2640416.75	497659.94			ND	GMP OCT-05
96	2640886.44	495636.59			ND	GMP OCT-05
97	2638223.15	496378.67			ND	GMP MAR-06
99	2639130.21	494402.19			ND	GMP SEP-05
100	2615992.13	494940.49			ND	GMP MAR-06
101	2613804.00	488282.00			ND	GMP OCT-05

Table 3-4
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Easting	Northing	Depth	Elevation	TCE Result	Source
102	2634808.07	506653.83			ND	GMP OCT-05
103	2639206.57	498075.43			ND	GMP SEP-05
104	2639996.82	498342.92			ND	GMP OCT-05
105	2640496.13	494536.87			ND	GMP SEP-05
106	2638315.64	496388.80			ND	GMP MAR-06
107	2640196.16	499375.50			ND	GMP SEP-05
108	2630546.01	512117.70			ND	GMP SEP-05
109	2640254.10	493992.07			ND	GMP SEP-05
110	2639142.65	494086.88			ND	GMP SEP-05
111	2634659.97	506407.68			ND	GMP SEP-05
UNFL-23	2608843.30	497126.81			ND	GMP SEP-05
UNFL-27	2618563.96	510045.20			ND	GMP SEP-05
UNFL-10A	2606548.99	503074.78			ND	GMP MAR-06
UNFL-IR-12	2603261.78	506824.04			ND	GMP JUN-05
UNFL-9A	2613347.82	510347.01			ND	GMP JUN-04
DP-78-1	2610129.15	492268.53	44	1056.42	ND	ECC JUNE 04
DP-79-2	2610594.92	492140.15	78	1023.24	ND	ECC JUNE 04
DP-80-2	2610856.75	492241.60	78	1024.11	ND	ECC JUNE 04
DP-80-3	2610934.75	492082.32	76	1024.44	ND	ECC JUNE 04
DP-80-4	2611018.55	491908.82	81	1019.46	ND	ECC JUNE 04
DP-81-1	2611193.13	492277.90	75	1027.54	ND	ECC JUNE 04
DP-81-2	2611331.06	492116.13	84	1017.56	ND	ECC JUNE 04
DP-81-3	2611405.99	491993.92	82	1019.19	ND	ECC JUNE 04
DP-82-1	2619171.52	493174.18	92	1058.49	ND	ECC JUNE 04
DP-82-2	2619225.33	493005.06	92	1058.99	ND	ECC JUNE 04
DP-83-1	2621916.18	495259.48	102	1048.44	ND	ECC JUNE 04
DP-83-2	2621983.52	495163.83	100	1050.44	ND	ECC JUNE 04
DP-84-1	2624254.30	495702.39	80	1063.63	ND	ECC JUNE 04
DP-84-2	2624352.62	495524.18	81	1066.98	ND	ECC JUNE 04
DP-85-1	2628364.68	494414.53	82	1048.44	ND	ECC JUNE 04
DP-85-2	2628467.72	494123.52	84	1048.37	ND	ECC JUNE 04
DP-86-1	2631988.92	493956.51	57	1049.13	ND	ECC JUNE 04
DP-86-2	2632105.26	494008.75	53	1053.89	ND	ECC JUNE 04
DP-87-1	2635425.10	486859.84	38	1032.24	ND	ECC JUNE 04
DP-87-2	2635229.37	492134.11	38	1038.51	ND	ECC JUNE 04
DP-88-1	2637614.82	494016.68	47	1037.84	ND	ECC JUNE 04
EW-1	2634926.92	495190.58			6.97	ECC MAY 06
EW-2	2632445.94	496479.68			ND	ECC MAY 06
EW-3	2629583.28	497009.50			ND	ECC MAY 06
EW-4	2627116.10	497384.80			ND	ECC MAY 06
EW-5	2624295.95	497923.55			ND	ECC MAY 06
EW-6	2622892.98	497269.75			ND	ECC MAY 06
EW-7	2621781.70	496331.02			ND	ECC MAY 06
EW-8	2607945.83	499756.90			95.7	ECC MAY 06
EW-9	2620401.35	495320.23			ND	ECC MAY 06
EW-10	2619241.53	494857.11			ND	ECC MAY 06
EW-11	2609168.75	499999.28			7000	ECC FEB 02
EW-12	2610718.18	493104.87			15.5	ECC APRIL 06
EW-13	2611520.73	493092.65				

Table 3-5
Number and Dates of Samples Used for Plume Characterization
Former Nebraska Ordnance Plant, Mead, Nebraska

Sampling Event	TCE Shallow No. of Samples	TCE Interm. No. of Samples	RDX Shallow No. of Samples	RDX Interm. No. of Samples
Extraction Wells, ECC Apr-06	0	1	0	1
Extraction Wells, ECC May-06	0	10	0	10
Direct-Push, URS Mar-06	100	81	55	6
Monitoring Wells, GMP Mar-06	33	35	35	37
Supply Wells, GMP Mar-06	0	30	0	30
Monitoring Wells (LF), UNL Feb-06	13	17	15	17
Direct-Push, URS Jan/Feb-06	21	21	6	12
Direct-Push (LF), UNL Jan-06	2	0	2	0
Direct-Push, URS Oct/Nov-05	77	82	113	58
Supply Wells, GMP Oct-05	0	13	0	6
Supply Wells, GMP Sep-05	0	23	0	31
Monitoring Wells, ECC Jul-05	0	2	0	2
Supply Wells, GMP Jun-05	0	1	0	1
Monitoring Wells, GMP Mar-05	2	3	2	2
Monitoring Wells, GMP Sep-04	5	4	0	1
Direct-Push, ECC Jun-04	25	21	21	20
Supply Wells, GMP Jun-04	0	1	0	1
Direct-Push, ECC May-04	1	0	0	0
Monitoring Wells (BAZE), URS Dec-03	0	0	11	0
Direct-Push (BAZE), URS Sep-03	0	0	13	7
Monitoring Wells, GMP Sep-03	3	2	3	1
Direct-Push (LL1), URS Mar-03	71	52	6	5
Monitoring Wells, GMP Mar-03	1	0	4	2
Direct-Push, URS Apr-02	34	37	3	0
Extraction Wells, ECC Feb-02	0	1	0	0
Monitoring Wells, GMP Dec-01	2	0	0	0
UNL Supply Wells, GMP Jun-01	0	5	0	5
Direct-Push (GCW), URS Apr-01	42	6	0	0
Direct-Push (GCW), URS Mar-01	7	0	0	3
Monitoring Wells (GCW), URS Mar-01	0	0	7	0
Monitoring Wells, GMP Dec-00	2	4	5	5
Supply Wells (UNL), URS Sep-00	0	1	0	2
Monitoring Wells, GMP Dec-99	0	1	0	0
UNL Supply Wells (UNL), URS Jun-96	0	24	0	24
Monitoring Wells, GMP Jul-97	2	1	3	2
Monitoring Wells, GMP Jun-95	10	6	9	9
Monitoring Wells, GMP Jun-95	0	0	0	1
Supply Wells (UNL), GMP Jun/Dec-94	0	4	0	6
Monitoring Wells, GMP Dec-94	1	0	1	0
Monitoring Wells, GMP Jun-93	4	3	5	3
Monitoring Wells, GMP May-93	4	4	2	2

Table 5-1
Comparison of Simulated and Observed Hydraulic Heads under Steady State Condition
March 29, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
MW-84A	2,624,277.77	495,685.51	1,089.28	1,089.31	-0.03
MW-84AR	2,624,273.89	495,704.26	1,089.28	1,089.32	-0.04
MW-85A	2,628,326.52	494,439.02	1,084.76	1,084.55	0.21
MW-89A	2,610,430.84	494,253.88	1,102.43	1,102.76	-0.33
MW-90A	2,611,235.54	494,302.04	1,103.04	1,102.81	0.23
MW-91A	2,612,076.97	494,323.00	1,102.81	1,102.66	0.15
MW-92A	2,610,047.26	492,722.58	1,098.64	1,098.60	0.04
MW-93A	2,612,162.89	493,551.29	1,101.61	1,101.42	0.19
OW-13	2,634,931.02	495,125.05	1,072.33	1,071.86	0.47
OW-14	2,634,938.63	494,991.12	1,073.08	1,072.74	0.34
OW-15	2,634,949.63	494,791.56	1,073.24	1,073.24	0.00
OW-17	2,607,999.94	499,877.66	1,110.47	1,111.34	-0.87
OW-18	2,608,114.43	499,884.02	1,111.20	1,111.72	-0.52
OW-19	2,608,709.98	499,902.62	1,113.47	1,112.84	0.63
OW-20	2,607,954.58	499,696.42	1,109.32	1,110.01	-0.69
OW-21	2,607,936.83	499,559.45	1,110.06	1,110.96	-0.90
OW-22	2,608,019.74	499,355.14	1,110.82	1,111.19	-0.37
OW-23	2,607,158.35	499,656.44	1,112.26	1,112.83	-0.57
OW-24	2,629,552.06	496,984.50	1,082.79	1,082.70	0.09
OW-25	2,629,511.42	496,932.08	1,083.14	1,083.08	0.06
OW-27	2,629,582.05	496,942.21	1,082.85	1,082.95	-0.10
OW-28	2,629,581.52	496,898.00	1,082.89	1,083.03	-0.14
OW-30	2,629,965.06	497,303.88	1,083.48	1,083.56	-0.08
OW-31	2,624,242.96	497,898.99	1,089.66	1,089.23	0.43
OW-32	2,624,139.95	497,845.07	1,090.45	1,090.15	0.30
OW-33	2,623,750.57	497,669.79	1,090.91	1,090.81	0.10
OW-34	2,624,320.18	497,868.57	1,089.02	1,089.86	-0.84
OW-35	2,624,360.77	497,738.45	1,090.43	1,090.19	0.24
OW-36	2,624,413.00	497,337.59	1,090.42	1,090.20	0.22
OW-37	2,624,838.27	498,178.34	1,091.97	1,091.49	0.48
OW-38	2,621,733.08	496,294.86	1,086.19	1,085.60	0.59
OW-39	2,621,620.02	496,212.33	1,088.71	1,088.05	0.66
OW-40	2,621,297.36	495,975.58	1,090.51	1,090.12	0.39
OW-41	2,621,816.64	496,281.90	1,085.16	1,086.58	-1.42
OW-42	2,621,899.70	496,169.42	1,087.72	1,088.06	-0.34
OW-43	2,622,135.38	495,845.76	1,089.72	1,089.31	0.41
OW-44	2,622,302.63	496,682.05	1,089.99	1,089.61	0.38
OW-45	2,619,203.17	494,842.21	1,089.61	1,089.92	-0.31
OW-46	2,619,059.00	494,783.35	1,092.29	1,092.02	0.27
OW-47	2,618,684.83	494,630.88	1,094.11	1,094.05	0.06
OW-48	2,619,283.37	494,800.47	1,090.25	1,090.08	0.17
OW-49	2,619,315.78	494,671.87	1,091.64	1,091.34	0.30
OW-50	2,619,465.62	494,300.16	1,092.51	1,092.31	0.20
OW-51	2,619,790.64	495,096.02	1,092.24	1,091.82	0.42
OW-52	2,610,585.60	493,033.91	1,091.26	1,091.54	-0.28
OW-53	2,610,555.96	493,019.67	1,092.99	1,092.62	0.37
OW-54	2,611,356.56	493,520.93	1,100.79	1,100.87	-0.08
OW-55	2,610,821.53	492,991.93	1,090.26	1,090.41	-0.15
OW-56	2,611,642.99	493,196.43	1,100.54	1,100.46	0.08
OW-57	2,611,768.76	493,277.87	1,100.83	1,100.79	0.04

Table 5-1
Comparison of Simulated and Observed Hydraulic Heads under Steady State Condition
March 29, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
OW-58	2,611,366.56	493,009.96	1,098.62	1,098.42	0.20
OW-59	2,611,579.97	493,019.21	1,099.60	1,099.51	0.09
TH-EW-13	2,611,511.12	493,072.65	1,099.46	1,099.49	-0.03
M90-01	2,640,455.42	488,890.60	1,070.06	1,071.75	-1.69
M90-02	2,645,847.63	489,077.74	1,069.90	1,071.90	-2.00
M90-04	2,640,691.71	483,550.58	1,066.23	1,068.31	-2.08
M90-05R	2,645,376.90	482,407.45	1,064.74	1,065.45	-0.71
M90-09	2,640,867.78	478,166.84	1,062.87	1,064.57	-1.70
M90-12R	2,647,968.37	479,417.11	1,063.01	1,063.21	-0.20
M90-15	2,641,208.48	472,922.36	1,058.20	1,059.73	-1.53
M90-16R	2,645,163.60	473,189.18	1,057.95	1,057.60	0.35
M90-17R	2,648,767.27	473,369.96	1,056.36	1,057.34	-0.98
M90-20R	2,651,322.46	470,713.43	1,056.56	1,056.15	0.41
M90-21	2,641,545.34	467,809.69	1,053.30	1,055.36	-2.06
M90-22R	2,645,155.42	467,864.02	1048.48*	1,051.09	-2.61
M90-23R	2,649,338.83	468,643.87	1042.25*	1,043.99	-1.74
M90-24R	2,649,970.82	466,109.57	1,043.22	1,044.22	-1.00
M90-26R	2,653,200.86	465,471.63	1,050.91	1,050.65	0.26
M90-36R	2,655,933.49	464,937.59	1,052.30	1,051.90	0.40
M90-37	2,652,867.09	463,331.64	1,050.84	1,049.87	0.97
Frahm	2,626,758.00	493,346.43	1,085.85	1,086.07	-0.22
N.Keiser	2,632,145.88	495,086.41	1,079.61	1,078.83	0.78
N.Wann	2,642,528.87	520,668.96	1,104.38	1,103.64	0.74
PV-37	2,644,078.49	514,706.21	1,094.72	1,094.41	0.31
PV-38	2,642,739.04	516,678.89	1,096.29	1,096.09	0.20
PV-39	2,635,349.12	501,829.63	1,083.63	1,083.08	0.55
PV-40	2,645,299.55	502,918.87	1,085.55	1,084.97	0.58
PV-41	2,642,174.34	514,042.60	1,091.28	1,091.41	-0.13
S.Keiser	2,632,581.12	493,970.29	1,076.63	1,077.38	-0.75
S.Wann	2,642,880.11	487,759.09	1,069.25	1,070.99	-1.74
TV-17A	2,627,487.94	482,977.99	1,082.09	1,080.32	1.77
MUD_90-10	2,645,430.50	516,093.59	1,095.36	1,096.94	-1.58
MUD_94-3	2,646,191.75	498,899.86	1,079.65	1,080.33	-0.68
MUD_94-4	2,645,711.85	509,564.70	1,090.66	1,091.31	-0.65
MUD_94-5	2,640,274.41	514,549.30	1,093.78	1,094.11	-0.33
MUD_94-6	2,639,186.28	503,954.84	1,083.68	1,083.19	0.49
MUD_94-7	2,643,737.27	493,588.88	1,075.06	1,075.02	0.04
Residual Mean					-0.096
Res. Std. Dev.					0.680
Sum of Squares					64.702
Abs. Res. Mean					0.456
Min. Residual					-2.612
Max. Residual					1.767
Range					107.115
Std/Range					0.006

Note: ft = feet

* The observed hydraulic heads on March 29, 2006 at M90-22R and M90-23R appear unreasonable. The observations on October 30, 2006 at these wells were used in calibration.

** The observed hydraulic head on March 29, 2006 at D. Starns is much lower than the surrouding heads even though there was no pumping near by, which appears unreasonable, thus was not used in calibration,

Table 5-2
Simulated Pumping Rates for Quasi-Steady Calibration, March 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Owner Well ID	NRD Well ID	Q (GPM)
LWS 56-8	2907	391.2
LWS 56-9	2908	391.2
LWS 56-5	2909	391.2
LWS 54-3	2910	391.2
LWS 56-7	2911	391.2
LWS 54-5	2912	391.2
LWS 325A	121138	547.6
LWS 54-7	2914	391.2
LWS 32-4-2	2917	279.4
LWS 54-9	2918	391.2
LWS 32-4A-2	2919	279.4
LWS 54-6	2921	391.2
LWS 32-3-2	2922	391.2
LWS 54-8	2923	502.9
LWS 32-2-2	2924	391.2
LWS 54-10	2926	698.5
LWS 32-1A	105710	558.8
LWS 56-1	2931	391.2
LWS 49-7	2932	391.2
LWS 49-8	121139	549.0
LWS 49-6	2934	391.2
LWS 49-9	2935	391.2
LWS 54-1	2936	391.2
LWS 66 - 1	78466	391.2
LWS 76 - 1	78469	838.2
LWS 66 - 4	78470	391.2
LWS 76 - 2	78471	838.2
LWS 66 - 5	78472	391.2
LWS 66 - 6	78473	391.2
LWS 76 - 3	78474	838.2
LWS 76 - 4	78475	838.2
LWS 68-1A	168254	628.7
LWS 76 - 5	78477	838.2
LWS 76 - 6	78478	502.9
LWS (NA)	78574	391.2
LWS 86-1	81099	614.7
LWS 86-2	81100	614.7
LWS (NA)	85451	3,408.8
LWS (NA)	86646	3,408.8
Ashland(82-1)	3098	30.0
Ashland(#4)	3099	75.0
Ashland(#5)	78501	65.0
Ashland(2006-1)	177281	0.0
Ithaca(1)	78857	5.8
Ithaca(2)	78858	5.8
Mead(1)	73325	11.0

Table 5-2
Simulated Pumping Rates for Quasi-Steady Calibration, March 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Owner Well ID	NRD Well ID	Q (GPM)
Mead(2)	73327	11.0
Mead(3)	73328	11.0
Mead(4)	84291	11.0
Memphis(73-1)	47715	3.0
Memphis(94-1)	156994	5.0
EW-1	118611	173.0
EW-2	137208	149.0
EW-3	137209	218.0
EW-4	137210	104.0
EW-5	137211	236.0
EW-6	137212	253.0
EW-7	137213	307.0
EW-8	118612	304.0
EW-9	137214	164.0
EW-10	137215	347.0
EW-11	137216	0.0
EW-12	169673	325.0
EW-13	169672	0.0

Table 5-3
Model Water Budget under Steady State Condition
Former Nebraska Ordnance Plant, Mead, Nebraska

Location	Inflow		Outflow	
	(gpm)	(cfs)	(gpm)	(cfs)
Layer 1				
Drain (Agriculture drain tiles)	NA	NA	2,197	4.90
ET			12,651	28.19
Recharge	7,278	16.22	NA	NA
Layer 2				
General Head Boundary	1,494	3.33	562	1.25
Recharge	10,959	24.42	NA	NA
River	35,654	79.44	10,103	22.51
Drain (Stream)	NA	NA	2,996	6.68
Well	0	0.00	13,640	30.39
Layer 3				
General Head Boundary	1,493	3.33	562	1.25
Recharge	7	0.02	NA	NA
Well	0	0.00	14,174	31.58
Model				
General Head Boundary	2,987	6.66	1,124	2.50
Recharge	18,244	40.65	NA	NA
ET			12,651	28.19
River	35,654	79.44	10,103	22.51
Drain (Stream and Drain Tiles)	NA	NA	5,193	11.57
Well	0	0.0	27,814	61.97
Total	**56,886**	**126.75**	**56,885**	**126.75**

Note:

cfs = cubic feet per second

gpm = gallons per minute

NA = not applicable

Table 5-4
Simulated Stream-Aquifer Interaction Fluxes under Steady State Condition
Former Nebraska Ordnance Plant, Mead, Nebraska

River/Creek/Drain	Section	Stream Gaining (gpm)	Stream Gaining (cfs)	Stream Losing (gpm)	Stream Losing (cfs)	Net Gaining (cfs)
Platte River		262	0.6	33,633	74.9	-74.4
Elkhorn River		5,686	12.7	123	0.3	12.4
Clear Creek upstream of Johnson Creek	1	294	0.7	NA	NA	0.7
Johnson Creek at USGS gauge	2	409	0.9	NA	NA	0.9
Johnson between USGS gauge and Clear Creek	3	236	0.5	NA	NA	0.5
Clear Creek downstream of Johnson Creek	4	944	2.1	NA	NA	2.1
Wahoo Creek (above Ithaca)	5	584	1.3	32	0.1	1.2
Wahoo Creek (Gauge-1 and Gauge 2)	7	1,292	2.9	292	0.6	2.2
Wahoo Creek (Gauge-2 and Ithaca)	6	898	2.0	54	0.1	1.9
Wahoo Creek (Ashland Gauge 1)	8	965	2.1	239	0.5	1.6
Silver Creek upstream of Gauge-3	9	491	1.1	NA	NA	1.1
Silver Creek between Gauge-3 and Gauge-2	10	157	0.3	NA	NA	0.3
Silver Creek between Gauge-2 and Gauge-1	11	12	0.0	NA	NA	0.0
Silver Creek between Gauge-2 and Wahoo Creek	12	435	1.0	NA	NA	1.0
Agricultural Drain at Johnson Creek	13	733	1.6	NA	NA	1.6
Agricultural Drain at Clear Creek	14	1,464	3.3	NA	NA	3.3

Note:
cfs = cubic feet per second
gpm = gallons per minute

Table 5-1
Comparison of Simulated and Observed Hydraulic Heads under Steady State Condition
March 29, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
MW-01A	2,618,459.71	511,743.03	1,131.26	1,131.25	0.00
MW-02A	2,606,800.10	506,250.32	1,130.41	1,130.49	-0.08
MW-03A	2,607,532.26	506,223.42	1,129.84	1,129.90	-0.07
MW-04A	2,612,041.94	506,256.77	1,128.15	1,127.48	0.68
MW-05A	2,613,044.09	507,097.63	1,129.09	1,128.86	0.23
MW-06A	2,617,375.69	506,522.12	1,122.09	1,122.22	-0.12
MW-07A	2,618,267.10	507,274.83	1,122.36	1,122.47	-0.11
MW-10A	2,607,883.83	496,858.27	1,107.62	1,108.11	-0.49
MW-11	2,626,486.32	509,499.80	1,119.17	1,119.15	0.01
MW-16B	2,604,911.66	514,026.38	1,149.37	1,149.36	0.00
MW-17B	2,603,293.03	499,101.48	1,117.38	1,116.77	0.61
MW-18B	2,629,156.57	506,827.46	1,099.46	1,099.57	-0.11
MW-19B	2,618,429.63	517,576.97	1,141.61	1,141.63	-0.02
MW-21A	2,607,121.37	503,524.81	1,125.42	1,125.06	0.36
MW-22A	2,606,598.39	510,402.07	1,140.71	1,140.55	0.16
MW-23A	2,606,402.57	509,376.37	1,137.83	1,137.96	-0.13
MW-24A	2,608,476.90	501,919.83	1,119.46	1,119.29	0.17
MW-25A	2,608,308.41	504,875.16	1,126.81	1,126.84	-0.03
MW-27A	2,611,434.64	508,103.04	1,133.43	1,132.80	0.63
MW-28A	2,612,951.02	502,242.71	1,117.81	1,117.12	0.69
MW-29A	2,614,469.84	498,383.11	1,106.85	1,106.91	-0.06
MW-31A	2,617,943.95	503,233.70	1,114.40	1,113.70	0.70
MW-32A	2,619,697.25	499,062.26	1,100.77	1,100.70	0.07
MW-33A	2,622,410.84	502,847.91	1,104.50	1,104.40	0.10
MW-34A	2,624,442.78	498,806.30	1,093.04	1,093.07	-0.03
MW-35A	2,629,595.76	496,323.64	1,083.11	1,083.18	-0.07
MW-36A	2,634,814.84	496,694.95	1,075.50	1,074.88	0.62
MW-37A	2,633,418.32	491,651.94	1,076.46	1,075.83	0.63
MW-38A	2,638,131.88	496,248.57	1,075.26	1,075.64	-0.38
MW-39A	2,640,060.00	499,307.00	1,076.20	1,077.97	-1.77
MW-40A	2,623,018.62	511,963.35	1,126.59	1,126.61	-0.02
MW-41A	2,624,371.47	512,001.33	1,125.39	1,125.44	-0.05
MW-42A	2,629,385.19	501,582.56	1,091.48	1,091.34	0.14
MW-43A	2,629,243.07	504,317.91	1,094.98	1,095.23	-0.25
MW-44A	2,632,953.68	500,415.12	1,083.21	1,083.91	-0.70
MW-45A	2,635,043.54	499,241.12	1,077.91	1,078.23	-0.32
MW-46A	2,637,464.94	499,387.37	1,078.42	1,077.81	0.61
MW-52A	2,627,012.55	508,784.57	1,113.69	1,113.59	0.10
MW-53A	2,627,897.77	508,169.88	1,105.88	1,105.91	-0.03
MW-54A	2,627,893.82	508,858.25	1,107.64	1,107.75	-0.11
MW-55A	2,628,135.40	508,377.66	1,105.92	1,106.04	-0.12
MW-56A	2,628,206.01	508,215.32	1,105.36	1,105.33	0.03
MW-60A	2,624,702.83	489,585.15	1,087.15	1,086.91	0.24
MW-61A	2,608,656.02	492,900.05	1,100.62	1,100.40	0.22
MW-62A	2,635,396.62	493,874.24	1,073.65	1,073.74	-0.09
MW-79A	2,610,432.14	492,336.21	1,098.16	1,097.95	0.21
MW-80A	2,610,925.54	492,067.12	1,097.97	1,097.62	0.35
MW-81A	2,611,637.99	492,369.38	1,098.08	1,098.08	0.00
MW-82A	2,619,288.65	493,318.05	1,093.19	1,093.39	-0.20
MW-83A	2,621,924.08	495,274.66	1,090.35	1,089.94	0.41

Table 5-5
Verification of Steady State Model Using Observed Heads
October 30, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
M90-01	2,640,455.42	488,890.60	1,069.69	1,071.75	-2.06
M90-02	2,645,847.63	489,077.74	1,069.94	1,071.90	-1.96
M90-04	2,640,691.71	483,550.58	1,066.58	1,068.31	-1.73
M90-05R	2,645,376.90	482,407.45	1,066.04	1,065.45	0.59
M90-09	2,640,867.78	478,166.84	1,063.43	1,064.57	-1.14
M90-12R	2,647,968.37	479,417.11	1,063.14	1,063.21	-0.07
M90-15	2,641,208.48	472,922.36	1,058.42	1,059.73	-1.31
M90-16R	2,645,163.60	473,189.18	1,058.55	1,057.60	0.95
M90-17R	2,648,767.27	473,369.96	1,058.02	1,057.34	0.68
M90-20R	2,651,322.46	470,713.43	1,056.87	1,056.15	0.72
M90-21	2,641,545.34	467,809.69	1,053.65	1,055.36	-1.71
M90-22R	2,645,155.42	467,864.02	1,048.48	1,051.09	-2.61
M90-23R	2,649,338.83	468,643.87	1,042.25	1,043.99	-1.74
M90-24R	2,649,970.82	466,109.57	1,044.65	1,044.22	0.43
M90-26R	2,653,200.86	465,471.63	1,050.61	1,050.65	-0.04
M90-36R	2,655,933.49	464,937.59	1,052.01	1,051.90	0.11
M90-37	2,652,867.09	463,331.64	1,050.58	1,049.87	0.71
Frahm	2,626,758.00	493,346.43	1,085.22	1,086.07	-0.85
N.Keiser	2,632,145.88	495,086.41	1,079.22	1,078.83	0.39
N.Wann	2,642,528.87	520,668.96	1,103.79	1,103.64	0.15
PV-37	2,644,078.49	514,706.21	1,094.50	1,094.41	0.09
PV-38	2,642,739.04	516,678.89	1,096.70	1,096.09	0.61
PV-39	2,635,349.12	501,829.63	1,083.41	1,083.08	0.33
PV-40	2,645,299.55	502,918.87	1,084.30	1,084.97	-0.67
PV-41	2,642,174.34	514,042.60	1,090.87	1,091.41	-0.54
S.Keiser	2,632,581.12	493,970.29	1,076.19	1,077.38	-1.19
S.Wann	2,642,880.11	487,759.09	1,069.10	1,070.99	-1.89
TV-17A	2,627,487.94	482,977.99	1,081.60	1,080.32	1.28
MW-01A	2,618,459.71	511,743.03	1,131.02	1,131.25	-0.24
MW-02A	2,606,800.10	506,250.32	1,129.54	1,130.49	-0.95
MW-03A	2,607,532.26	506,223.42	1,128.82	1,129.90	-1.09
MW-04A	2,612,041.94	506,256.77	1,127.47	1,127.48	0.00
MW-05A	2,613,044.09	507,097.63	1,128.53	1,128.86	-0.33
MW-06A	2,617,375.69	506,522.12	1,121.45	1,122.22	-0.76
MW-07A	2,618,267.10	507,274.83	1,121.65	1,122.47	-0.82
MW-08A	2,622,863.97	506,814.76	1,114.41	1,114.88	-0.46
MW-09A	2,623,570.81	507,435.84	1,114.86	1,115.47	-0.61
MW-10A	2,607,883.83	496,858.27	1,107.40	1,108.11	-0.71
MW-11	2,626,486.32	509,499.80	1,120.64	1,119.15	1.48
MW-16B	2,604,911.66	514,026.38	1,148.30	1,149.36	-1.07
MW-17B	2,603,293.03	499,101.48	1,117.69	1,116.77	0.92
MW-18B	2,629,156.57	506,827.46	1,098.78	1,099.57	-0.79
MW-19B	2,618,429.63	517,576.97	1,140.80	1,141.63	-0.83
MW-20B	2,616,633.43	493,191.47	1,095.87	1,097.12	-1.25
MW-21A	2,607,121.37	503,524.81	1,124.59	1,125.06	-0.47
MW-22A	2,606,598.39	510,402.07	1,140.08	1,140.55	-0.47
MW-23A	2,606,402.57	509,376.37	1,137.16	1,137.96	-0.80
MW-24A	2,608,476.90	501,919.83	1,118.74	1,119.29	-0.55
MW-25A	2,608,308.41	504,875.16	1,125.77	1,126.84	-1.07

Table 5-5
Verification of Steady State Model Using Observed Heads
October 30, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
MW-26A	2,609,860.44	508,825.09	1,135.54	1,135.20	0.34
MW-27A	2,611,434.64	508,103.04	1,132.66	1,132.80	-0.14
MW-28A	2,612,951.02	502,242.71	1,117.05	1,117.12	-0.07
MW-29A	2,614,469.84	498,383.11	1,106.21	1,106.91	-0.70
MW-30A	2,616,288.05	507,064.55	1,123.92	1,124.98	-1.06
MW-31A	2,617,943.95	503,233.70	1,113.76	1,113.70	0.06
MW-32A	2,619,697.25	499,062.26	1,100.23	1,100.70	-0.47
MW-33A	2,622,410.84	502,847.91	1,103.83	1,104.40	-0.57
MW-34A	2,624,442.78	498,806.30	1,092.65	1,093.07	-0.42
MW-35A	2,629,595.76	496,323.64	1,082.79	1,083.18	-0.39
MW-36A	2,634,814.84	496,694.95	1,075.23	1,074.88	0.35
MW-37A	2,633,418.32	491,651.94	1,076.16	1,075.83	0.33
MW-38A	2,638,131.88	496,248.57	1,075.21	1,075.64	-0.43
MW-39A	2,640,060.00	499,307.00	1,078.33	1,077.97	0.36
MW-40A	2,623,018.62	511,963.35	1,126.27	1,126.61	-0.34
MW-41A	2,624,371.47	512,001.33	1,125.44	1,125.44	0.00
MW-42A	2,629,385.19	501,582.56	1,090.73	1,091.34	-0.61
MW-43A	2,629,243.07	504,317.91	1,094.19	1,095.23	-1.04
MW-44A	2,632,953.68	500,415.12	1,082.88	1,083.91	-1.03
MW-45A	2,635,043.54	499,241.12	1,077.77	1,078.23	-0.46
MW-46A	2,637,464.94	499,387.37	1,078.27	1,077.81	0.46
MW-47A	2,603,834.71	524,480.73	1,168.84	1,167.38	1.46
MW-52A	2,627,012.55	508,784.57	1,114.14	1,113.59	0.55
MW-53A	2,627,897.77	508,169.88	1,105.46	1,105.91	-0.45
MW-54A	2,627,893.82	508,858.25	1,107.39	1,107.75	-0.36
MW-55A	2,628,135.40	508,377.66	1,105.59	1,106.04	-0.45
MW-56A	2,628,206.01	508,215.32	1,104.93	1,105.33	-0.40
MW-60A	2,624,702.83	489,585.15	1,086.43	1,086.91	-0.48
MW-61A	2,608,656.02	492,900.05	1,100.62	1,100.40	0.22
MW-62A	2,635,396.62	493,874.24	1,073.39	1,073.74	-0.35
MW-79A	2,610,432.14	492,336.21	1,098.06	1,097.95	0.11
MW-80A	2,610,925.54	492,067.12	1,097.88	1,097.62	0.26
MW-81A	2,611,637.99	492,369.38	1,097.92	1,098.08	-0.16
MW-82A	2,619,288.65	493,318.05	1,092.56	1,093.39	-0.83
MW-83A	2,621,924.08	495,274.66	1,089.86	1,089.94	-0.08
MW-84A	2,624,277.77	495,685.51	1,088.85	1,089.31	-0.46
MW-84AR	2,624,273.89	495,704.26	1,088.84	1,089.32	-0.48
MW-85A	2,628,326.52	494,439.02	1,084.28	1,084.55	-0.27
MW-89A	2,610,430.84	494,253.88	1,102.01	1,102.76	-0.75
MW-90A	2,611,235.54	494,302.04	1,102.50	1,102.81	-0.31
MW-91A	2,612,076.97	494,323.00	1,102.14	1,102.66	-0.52
MW-92A	2,610,047.26	492,722.58	1,098.56	1,098.60	-0.04
MW-93A	2,612,162.89	493,551.29	1,100.95	1,101.42	-0.47
MUD_90-10	2,645,430.50	516,093.59	1,095.07	1,096.94	-1.87
MUD_94-3	2,646,191.75	498,899.86	1,079.68	1,080.33	-0.65
MUD_94-4	2,645,711.85	509,564.70	1,090.39	1,091.31	-0.92
MUD_94-5	2,640,274.41	514,549.30	1,093.73	1,094.11	-0.38
MUD_94-6	2,639,186.28	503,954.84	1,083.50	1,083.19	0.31
MUD_94-7	2,643,737.27	493,588.88	1,075.11	1,075.02	0.09

Table 5-5
Verification of Steady State Model Using Observed Heads
October 30, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
OW-01	2,607,927.78	499,751.19	1,108.20	1,109.65	-1.45
OW-02	2,607,887.77	499,740.64	1,108.96	1,110.28	-1.32
OW-03	2,607,941.06	499,793.70	1,108.45	1,110.12	-1.67
OW-04	2,607,941.17	499,768.09	1,107.45	1,109.72	-2.27
OW-05	2,634,938.91	495,185.76	1,070.14	1,071.92	-1.78
OW-06	2,634,888.37	495,207.57	1,071.21	1,072.54	-1.33
OW-07	2,634,888.21	495,205.12	1,071.82	1,072.53	-0.71
OW-08	2,634,790.16	495,195.78	1,072.31	1,073.11	-0.80
OW-09	2,634,941.88	495,136.17	1,071.42	1,071.64	-0.22
OW-11	2,635,255.85	495,171.05	1,070.91	1,073.05	-2.14
OW-12	2,636,334.21	495,282.45	1,073.73	1,074.40	-0.67
OW-13	2,634,931.02	495,125.05	1,071.31	1,071.86	-0.55
OW-14	2,634,938.63	494,991.12	1,072.34	1,072.74	-0.40
OW-15	2,634,949.63	494,791.56	1,072.68	1,073.24	-0.56
OW-16	2,633,483.41	495,162.80	1,074.59	1,076.13	-1.54
OW-17	2,607,999.94	499,877.66	1,109.96	1,111.34	-1.38
OW-18	2,608,114.43	499,884.02	1,110.69	1,111.72	-1.03
OW-19	2,608,709.98	499,902.62	1,112.88	1,112.84	0.04
OW-20	2,607,954.58	499,696.42	1,108.84	1,110.01	-1.17
OW-21	2,607,936.83	499,559.45	1,109.58	1,110.96	-1.38
OW-22	2,608,019.74	499,355.14	1,110.95	1,111.19	-0.24
OW-23	2,607,158.35	499,656.44	1,111.79	1,112.83	-1.04
OW-24	2,629,552.06	496,984.50	1,082.31	1,082.70	-0.39
OW-25	2,629,511.42	496,932.08	1,082.65	1,083.08	-0.43
OW-27	2,629,582.05	496,942.21	1,082.37	1,082.95	-0.58
OW-28	2,629,581.52	496,898.00	1,082.41	1,083.03	-0.62
OW-30	2,629,965.06	497,303.88	1,082.95	1,083.56	-0.61
OW-31	2,624,242.96	497,898.99	1,089.43	1,089.23	0.20
OW-32	2,624,139.95	497,845.07	1,090.13	1,090.15	-0.02
OW-33	2,623,750.57	497,669.79	1,090.50	1,090.81	-0.31
OW-34	2,624,320.18	497,868.57	1,088.76	1,089.86	-1.10
OW-35	2,624,360.77	497,738.45	1,090.08	1,090.19	-0.11
OW-36	2,624,413.00	497,337.59	1,090.03	1,090.20	-0.17
OW-37	2,624,838.27	498,178.34	1,091.60	1,091.49	0.11
OW-38	2,621,733.08	496,294.86	1,085.73	1,085.60	0.13
OW-39	2,621,620.02	496,212.33	1,088.26	1,088.05	0.21
OW-40	2,621,297.36	495,975.58	1,090.07	1,090.12	-0.05
OW-41	2,621,816.64	496,281.90	1,084.65	1,086.58	-1.93
OW-42	2,621,899.70	496,169.42	1,087.28	1,088.06	-0.78
OW-43	2,622,135.38	495,845.76	1,089.25	1,089.31	-0.06
OW-44	2,622,302.63	496,682.05	1,089.48	1,089.61	-0.13
OW-45	2,619,203.17	494,842.21	1,088.82	1,089.92	-1.10
OW-46	2,619,059.00	494,783.35	1,091.60	1,092.02	-0.42
OW-47	2,618,684.83	494,630.88	1,093.47	1,094.05	-0.58
OW-48	2,619,283.37	494,800.47	1,089.47	1,090.08	-0.61
OW-49	2,619,315.78	494,671.87	1,090.97	1,091.34	-0.37
OW-50	2,619,465.62	494,300.16	1,091.96	1,092.31	-0.35
OW-52	2,610,585.60	493,033.91	1,091.02	1,091.54	-0.52
OW-53	2,610,555.96	493,019.67	1,092.77	1,092.62	0.15

Table 5-5
Verification of Steady State Model Using Observed Heads
October 30, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Name	Easting (NAD83)	Northing (NAD83)	Observed Head (ft MSL NAVD88)	Computed Head (ft MSL NAVD88)	Residual (ft)
OW-54	2,611,356.56	493,520.93	1,100.30	1,100.87	-0.57
OW-55	2,610,821.53	492,991.93	1,089.75	1,090.41	-0.66
OW-56	2,611,642.99	493,196.43	1,100.02	1,100.46	-0.44
OW-57	2,611,768.76	493,277.87	1,100.28	1,100.79	-0.51
OW-58	2,611,366.56	493,009.96	1,098.29	1,098.42	-0.13
OW-59	2,611,579.97	493,019.21	1,099.20	1,099.51	-0.31
TH-EW-13	2,611,511.12	493,072.65	1,099.05	1,099.49	-0.44
Residual Mean					-0.480
Res. Std. Dev.					0.718
Sum of Squares					114.837
Abs. Res. Mean					0.677
Min. Residual					-2.612
Max. Residual					1.481
Range					126.590
Std/Range					0.006

Note: ft = feet

* LPN_06-01, LPN_06-18, LPN_06-19,LPN_06-20, and LPN_06-21 were not used in verification, as their reported water levels on October 30, 2006 appear unreasonable.

** The observed hydraulic head on October 30, 2006 at D. Starns is much lower than the surrouding heads even though there was no pumping near by, which appears unreasonable, thus was not used in verification.

Table 5-6
LWS Well Field Monthly Pumping Rate (2002 - 2006)
Former Nebraska Ordnance Plant, Mead, Nebraska

Month	Monthly Wellfield Pumpage 2002 (mgpm)	Monthly Wellfield Pumpage 2003 (mgpm)	Monthly Wellfield Pumpage 2004 (mgpm)	Monthly Wellfield Pumpage 2005 (mgpm)	Monthly Wellfield Pumpage 2006 (mgpm)
January	895.29	931.25	846.25	878.76	890.45
February	800.01	798.25	825.23	810.02	826.50
March	894.91	905.16	869.13	869.89	932.50
April	1,062.34	1,129.58	1,099.77	1,076.28	960.40
May	1,137.90	1,096.84	1,201.79	1,411.05	1,204.04
June	2,119.89	1,193.91	1,317.98	1,529.83	1,770.57
July	2,154.52	2,139.36	1,428.30	2,046.93	2,008.85
August	1,825.59	1,932.58	1,819.83	1,724.35	1,559.68
September	1,533.79	1,457.81	1,619.24	1,712.69	
October	1,099.68	1,241.82	1,258.77	1,313.71	
November	940.27	962.16	873.42	985.25	
December	961.75	883.10	875.71	913.94	

Note:
mgpm = million gallons per month

Table 5-7
FNOP Quarterly Average Pumping Rates
2002 - 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

Stress Period	Date	EW-01 (gpm)	EW-02 (gpm)	EW-03 (gpm)	EW-04 (gpm)	EW-05 (gpm)	EW-06 (gpm)	EW-07 (gpm)	EW-08 (gpm)	EW-09 (gpm)	EW-10 (gpm)	EW-12 (gpm)
0	2/21/2002	0	0	0	0	0	0	0	0	0	0	0
1	2/22/2002 - 2/28/2002	185	175	236	132	252	306	331	316	268	428	0
2	3/1/2002 - 5/31/2002	185	175	236	132	227	306	331	315	269	427	0
3	6/1/2002 - 8/31/0202	180	175	227	125	251	309	329	320	260	420	0
4	9/1/2002 - 11/30/2002	176	175	221	120	250	309	329	321	241	412	0
5	12/1/2002 - 2/28/2003	171	175	220	115	250	314	320	323	226	376	0
6	3/1/2003 - 5/31/2003	166	175	220	110	250	292	315	316	219	380	0
7	6/1/2003 - 8/31/2003	164	174	219	109	250	290	314	312	216	380	0
8	9/1/2003 - 11/30/2003	160	173	218	105	251	292	299	310	215	392	0
9	12/1/2003 - 2/29/2004	154	169	221	107	249	280	300	312	215	396	0
10	3/1/2004 - 5/31/2004	148	168	220	117	245	259	290	310	198	375	0
11	6/1/2004 - 8/31/2004	148	168	219	116	244	253	280	310	185	374	0
12	9/1/2004 - 11/30/2004	199	150	220	121	249	268	300	336	190	401	0
13	12/1/2004 - 2/28/2005	197	151	220	115	249	240	274	338	180	406	0
14	3/1/2005 - 5/31/2005	200	151	219	110	252	233	264	333	180	409	0
15	6/1/2005 - 8/31/2005	200	151	219	110	252	233	264	333	180	409	0
16	9/1/2005 - 11/30/2005	197	150	219	105	251	276	305	305	178	401	0
17	12/1/2005 - 2/12/2006	187	150	220	104	249	276	304	304	171	396	0
18	2/13/2006 - 2/28/2006	173	149	218	104	236	253	307	304	164	347	325
19	3/1/2006 - 5/31/2006	163	148	216	103	237	259	308	306	151	307	325
20	6/1/2006 - 8/31/2006	218	147	216	114	220	277	304	296	148	352	325
21	9/1/2006 - 10/30/2006	232	147	215	114	205	270	307	296	141	305	325
22	10/31/2006 - 12/12/2006	210	151	249	110	181	262	296	296	138	283	325

Note:

gpm = gallons per minute

Table 5-8
Sensitivity Analysis
Steady State Flow Model Calibration
Former Nebraska Ordnance Plant, Mead, Nebraska

K at layer1

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.08	-0.06	-0.4	-0.12	-0.15	-0.18
Residual Std	0.68	0.68	0.69	0.69	0.68	0.67	0.67
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

K at layer 2 and layer 3

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.12	-0.14	-0.16	-0.07	-0.04	0
Residual Std	0.68	0.85	1.09	1.34	0.77	1.18	1.86
Residual NRMS	0.6%	0.8%	1.0%	1.3%	0.7%	1.1%	1.7%

Low K zone near EW 12 (Current K =20 ft/d)

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.11	-0.12	-0.13	-0.08	-0.06	-0.04
Residual Std	0.68	0.69	0.7	0.72	0.69	0.73	0.82
Residual NRMS	0.6%	0.6%	0.7%	0.7%	0.6%	0.7%	0.8%

Highest K zone near Platte River (Current K =500 ft/d)

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.08	-0.06	-0.04	-0.12	-0.16	-0.24
Residual Std	0.68	0.71	0.75	0.79	0.66	0.67	0.77
Residual NRMS	0.6%	0.7%	0.7%	0.7%	0.6%	0.6%	0.7%

V/H Ratio at layer 1 (current =1:10)

	Calibrated Result	1:15	1:20	1:50	1:5	1:2	1:1
Residual Mean	-0.1	-0.19	-0.26	-0.48	-0.04	0.16	0.23
Residual Std	0.68	0.67	0.67	0.73	0.71	0.77	0.81
Residual NRMS	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.8%

V/H Ratio at layer 2 and layer3 (current =1:10)

	Calibrated Result	1:15	1:20	1:50	1:5	1:2	1:1
Residual Mean	-0.1	-0.09	-0.08	-0.06	-0.1	-0.1	-0.1
Residual Std	0.68	0.68	0.68	0.72	0.68	0.68	0.68
Residual NRMS	0.6%	0.6%	0.6%	0.7%	0.6%	0.6%	0.6%

Table 5-8
Sensitivity Analysis
Steady State Flow Model Calibration
Former Nebraska Ordnance Plant, Mead, Nebraska

ET Rate

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.04	-0.01	0.06	-0.16	-0.22	-0.29
Residual Std	0.68	0.68	0.68	0.68	0.69	0.7	0.72
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%

ET Root Zone Depth

	Calibrated Result	+1 ft	+2 ft	+ 3ft	-1 ft	-2 ft	-3 ft
Residual Mean	-0.1	-0.03	0.03	0.09	-0.16	-0.22	-0.28
Residual Std	0.68	0.66	0.65	64	0.71	0.73	0.77
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%

Recharge Rate

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.75	-1.39	-2.02	0.58	0.92	1.98
Residual Std	0.68	0.69	0.9	1.21	0.9	1.06	1.64
Residual NRMS	0.6%	0.6%	0.8%	1.1%	0.8%	1.0%	1.5%

River Condutance at Wahoo Creek

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.08	-0.06	-0.05	-0.12	-0.14	-0.17
Residual Std	0.68	0.68	0.69	0.69	0.68	0.67	0.67
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

River Condutance at Platte River

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.11	-0.12	-0.13	-0.08	-0.07	-0.05
Residual Std	0.68	0.69	0.69	0.7	0.67	0.67	0.67
Residual NRMS	0.6%	0.6%	0.6%	0.7%	0.6%	0.6%	0.6%

River Condutance at EIK Horn River

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Residual Std	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

Table 5-8
Sensitivity Analysis
Steady State Flow Model Calibration
Former Nebraska Ordnance Plant, Mead, Nebraska

Drain Condutance at layer 1

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.09	-0.09	-0.09	-0.1	-0.1	-0.1
Residual Std	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

Drain Condutance at Siver Creek

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.07	-0.05	-0.02	-0.12	-0.16	-0.19
Residual Std	0.68	0.69	0.69	0.7	0.67	0.67	0.67
Residual NRMS	0.6%	0.6%	0.6%	0.7%	0.6%	0.6%	0.6%

Drain Condutance at Clear Creek (Up)

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.09	-0.09	-0.08	-0.1	-0.11	-0.11
Residual Std	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

Drain Condutance at Clear Creek (Down)

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.08	-0.07	-0.06	-0.11	-0.12	-0.14
Residual Std	0.68	0.68	0.67	0.67	0.68	0.69	0.7
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

Drain Condutance at Johnson Creek

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.08	-0.06	-0.05	-0.12	-0.14	-0.16
Residual Std	0.68	0.68	0.69	0.69	0.68	0.67	0.67
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

GHB Condutance

	Calibrated Result	+10%	+20%	+30%	-10%	-20%	-30%
Residual Mean	-0.1	-0.11	-0.11	-0.11	-0.09	-0.07	-0.06
Residual Std	0.68	0.68	0.68	0.68	0.68	0.69	0.69
Residual NRMS	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%

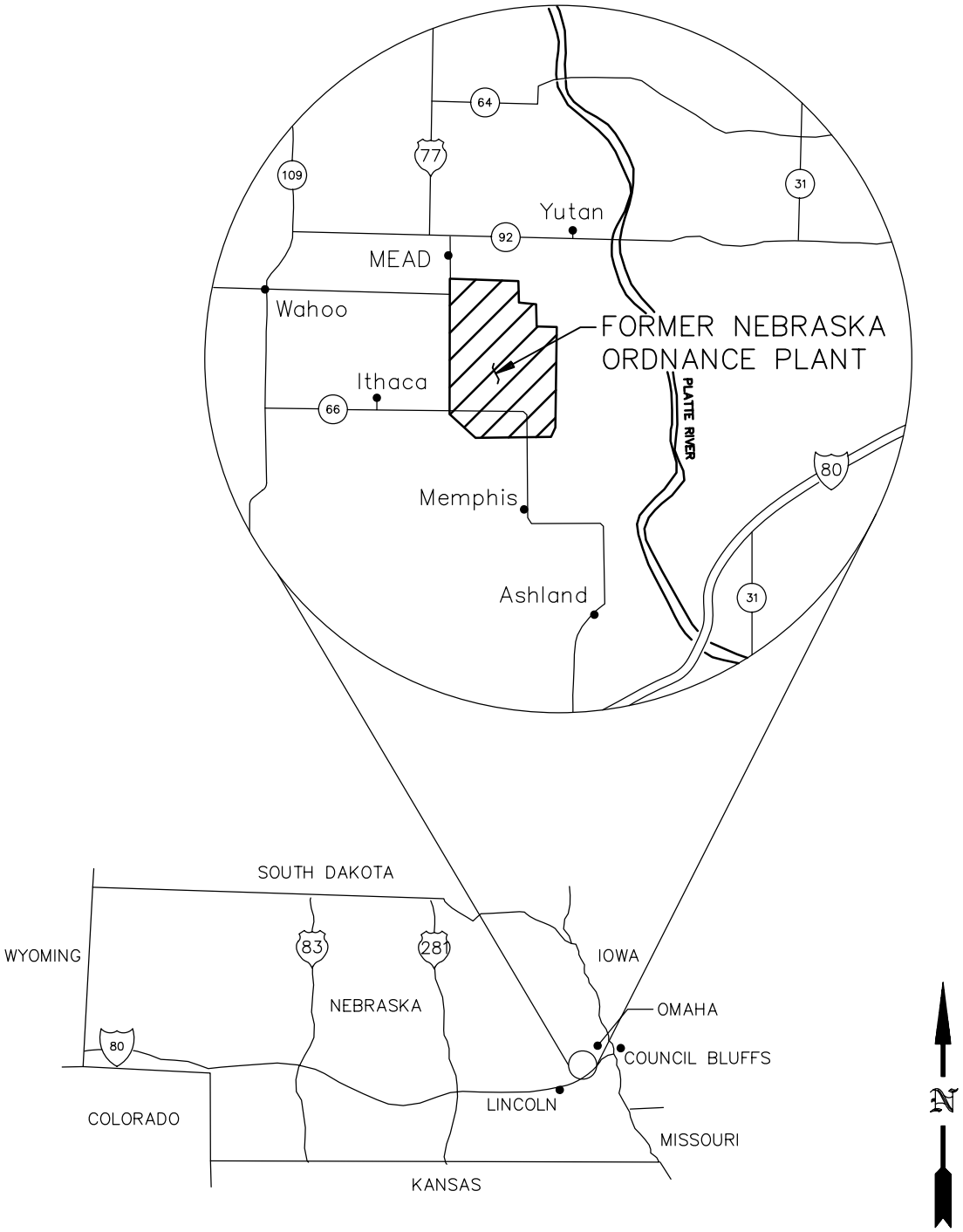
Table 6-1
Simulated TCE Mass Fluxes in Recent Years
Former Nebraska Ordnance Plant, Mead, Nebraska

	Steady State	End of Year 1			End of Year 5		
	Groundwater Flux (ft^3/day)	TCE Mass Flux (ug/L)(ft^3/day)	TCE Concentration (ug/L)	TCE Mass Flux (g/day)	TCE Mass Flux (ug/L)(ft^3/day)	TCE Concentration (ug/L)	TCE Mass Flux (g/day)
*To Drain Tiles near Johnson Creek	59,232	164,615	3	5	4,511,147	76	128
**To Johnson Creek	66,561	1,523,968	23	43	4,300,924	65	122
***To Clear Creek	14,790	18,830	1	1	78,071	5	2
To EW-1	33,303	95,071	3	3	67,140	2	2
To Irrigation wells in AMA plume	63,545	5,489,738	86	155	6,888,088	108	195
****To Silver Creek	0	0	0	0	0	0	0
To EW-8	52,580	1,724,316	33	49	3,494,505	66	99
To EW-12	62,563	525,633	8	15	344,046	5	10
Total				270			557

Notes:

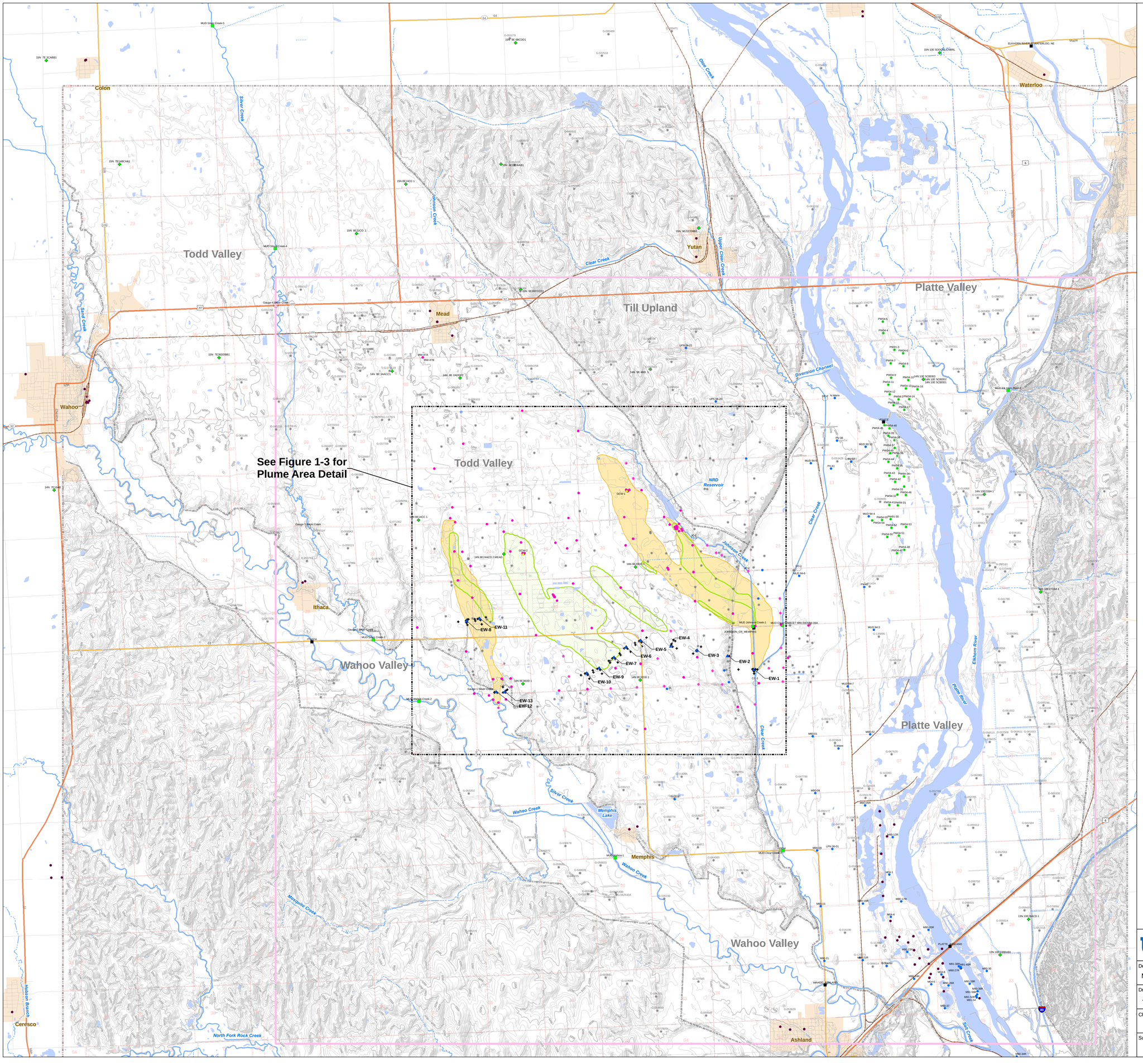
ft^3 = cubic feet
ug = micrograms
g = grams
L = liters

* To the drain tiles as Section 13 on Figure 5.2-5.
** To Johnson Creek between JC-2 and EW-1 on Figure 5.2-5.
*** To Clear Creek between MUD Clear Creek -1 and EW-1 on Figure 5.2-5.
**** To Silver Creek south of LL1 Plume.



URS Group Inc. 8300 College Boulevard, Suite 200 Overland Park, Kansas 66210		U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS KANSAS CITY, MISSOURI
Designed by: D.C.C.	U.S. Army Corps of Engineers	2006 GROUNDWATER MODELING REPORT FMR NEBRASKA ORDNANCE PLANT – MEAD, NEBRASKA
Drawn by: R.A.D.		**GENERAL SITE LOCATION MAP**
Checked by: R.J.E	Scale: NONE	Figure number: 1 — 1
Submitted by: L.A.T.	Date: MAY 2007	
	Dwg. No.: 1–1	

May 23, 2007 12:56.08 pm (rob)
J:\Mead\k96202\05610\2006 groundwater.dwg



Explanation

- USACE Extraction Well
- Groundwater Circulation Well
- USACE Monitoring Well
- Lower Platte North Natural Resource District Observation Well
- USACE Observation Well
- Abandoned Monitoring Well
- USACE Monitoring Well Installed after October 2006
- USACE Surface Water Measurement Locations
- MUD March 2005 Surface Water Measurement Locations
- USGS Stream Gauge
- Omaha Met. Utility Dist. Water Supply Well
- Other Municipal Water Supply Wells
- Irrigation Well, Domestic Well, or Stock Well
- Model Extent
- USGS Observation Wells
- Ground surface topography, 50' contour
- Ground surface topography, 10' contour
- RDX Plume 2006* (2 µg/L)
- TCE Plume 2006* (5 µg/L)
- Basin Boundaries

* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 3,000 6,000 Feet

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: MEW

Drawn by: JLC

Checked by: LAT

Submitted by:

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

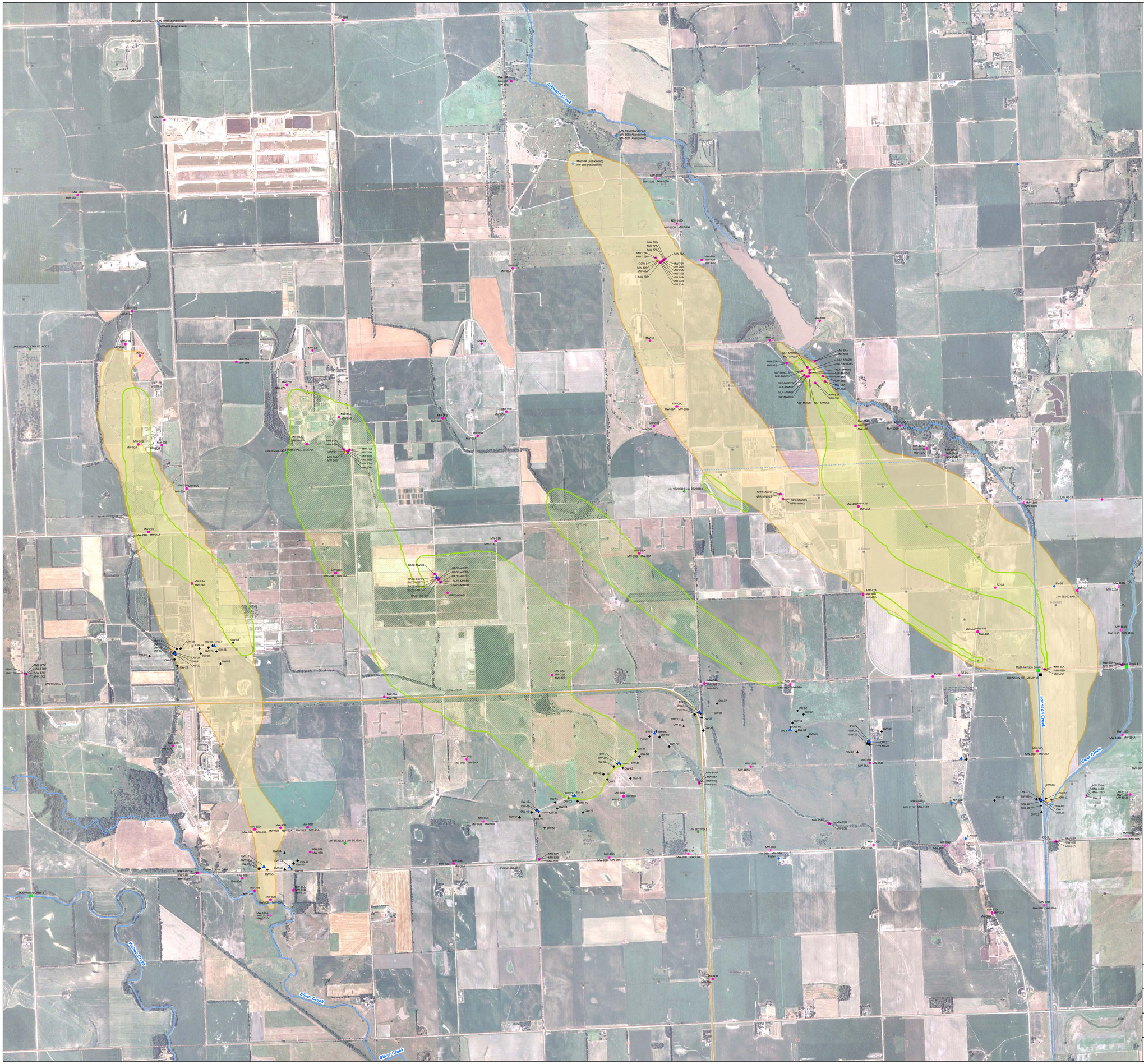
Mead Site Map with Interpreted Groundwater Containment Plumes

Scale:

Date: May 2007

Figure Number: 1-2

Fig: No.:



Explanation

- USACE Extraction Well
- Groundwater Circulation Well
- USACE Monitoring Well
- Lower Platte North Natural Resource District Observation Well
- USACE Observation Well
- Abandoned Monitoring Well
- USACE Monitoring Well Installed after October 2006
- USGS Observation Wells
- USACE Surface Water Measurement Locations
- MUD March 2005 Surface Water Measurement Locations
- USGS Stream Gauge
- Irrigation Well, Domestic Well, or Stock Well
- Model Extent
- RDX Plume 2006* (2 µg/L)
- TCE Plume 2006* (5 µg/L)

* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Aerial Imagery Source:
USDA National Agriculture Imagery Program (NAIP), 2005

N

0 1,000 2,000 Feet

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KANSAS CITY, MISSOURI

Designed by: MEW

Drawn by: JLC

Checked by: LAT

Submitted by:

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

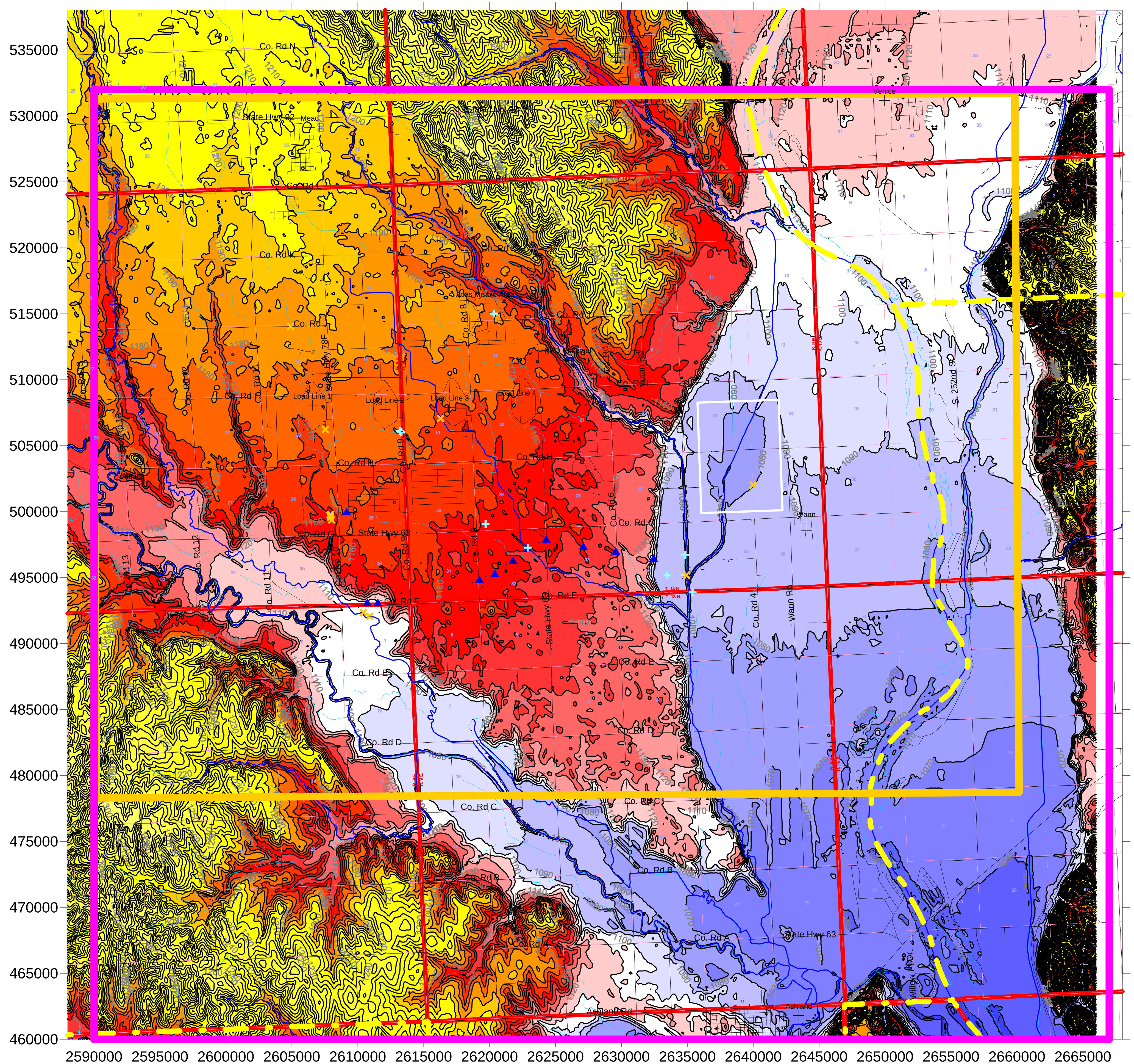
Mead Site Map with Interpreted Containment Plumes (Plume Area Detail)

Scale:

Date: May 2007

Figure Number: **1-3**

Fig: No.:



Ground Surface Elevation (ft NAVD 88)

1300, 1280, 1260, 1240, 1220, 1200, 1180, 1160, 1140, 1120, 1100, 1080, 1060, 1040, 1020

0 5000 10000 15000 20000

Surveyed elevation subtracted from NED elevation:
- -10.7 to -5.0
- -5.0 to 5.0
- 5.0 to 7.4

USACE Extraction Wells

Extent of GWM06 Model

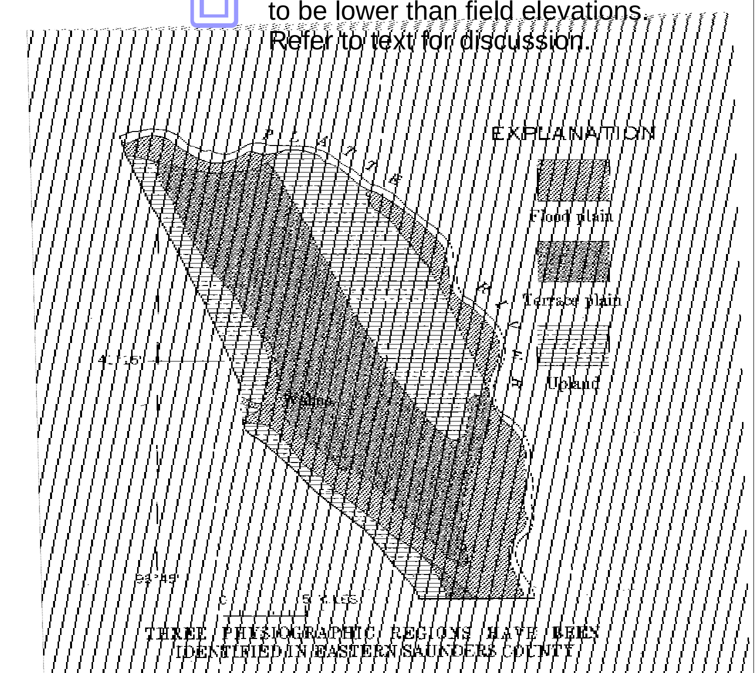
Extent of RDGMIV Model

1000 Ground Surface Elevation Contour (ft NAVD 1988)

County Line

Township Line

Area in which 1/3-arc second National Elevation Dataset topography appears to be lower than field elevations. Refer to text for discussion.



From Souders (1967).
The Terrace Plain corresponds to Todd Valley, and the Flood Plain corresponds to the Platte and Wahoo Creek valleys.

N

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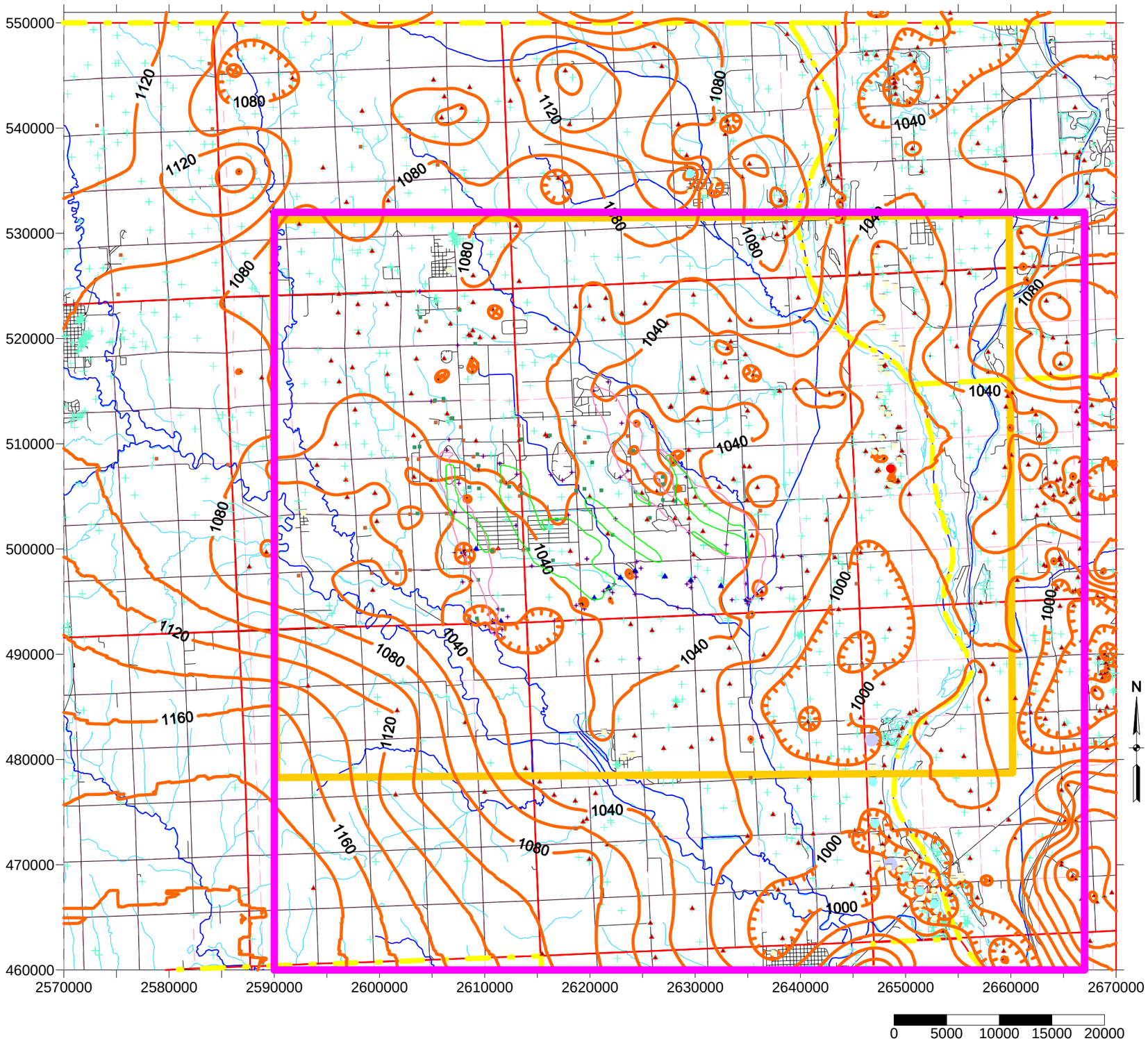
Drawn by: M.E.W.	2006 GROUNDWATER MODELING REPORT OPERABLE UNIT NO. 2 FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE
Checked by: C.M.Z.	**GROUND SURFACE ELEVATION**
Submitted by: L.A.T.	Scale: As Indicated; Date: May 2007; Fig. No.: 2-1; Figure Number: 2-1



Registered Wells, Tiger-2000, downloaded from NRD website, March 2006

Selected bedrock data from Neb. NRD Registered Well Data Base used for contour

Selected bedrock data from Souders (1967) used for contour

Selected bedrock data from Piskin (1971) used for contour

Selected bedrock data from monitoring well borings and observation well borings

Bedrock data from extraction well pilot holes

Extent GWM06 Model

Extent of RDGMIV Model

1000 Contour of Elevation of Top of Bedrock (ft NAVD 1988)

County Line

Township Line

RDX Plume 2006 (2 µg/L)

TCE Plume 2006 (5 µg/L)

Notes:
1) Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

2) Although this contour is generated from data points, it is an interpretation. Discrepancies and variation in data quality required selective editing of data. The contour was generated by compiling data from the posted sources, and comparing the elevations to a digitized contour of the statewide "Configuration of the Base of the Principal Aquifer" (USGS, 1979, http://csd.unl.edu/general/gis-datasets.asp) Data points were also compared to each other, and outliers were removed. Where nearby data points conflicted, preference was given to data from borings sampled with discrete samplers such as the monitoring well borings and extraction well pilot holes. Among borings sampled from cuttings, preference was given to the USGS and Piskin test holes over irrigation well logs.

Fig2-2 Bedrock_May2006_20070522.srf

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Drawn by: M.E.W.

Checked by: C.M.Z.

Submitted by: L.A.T.

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

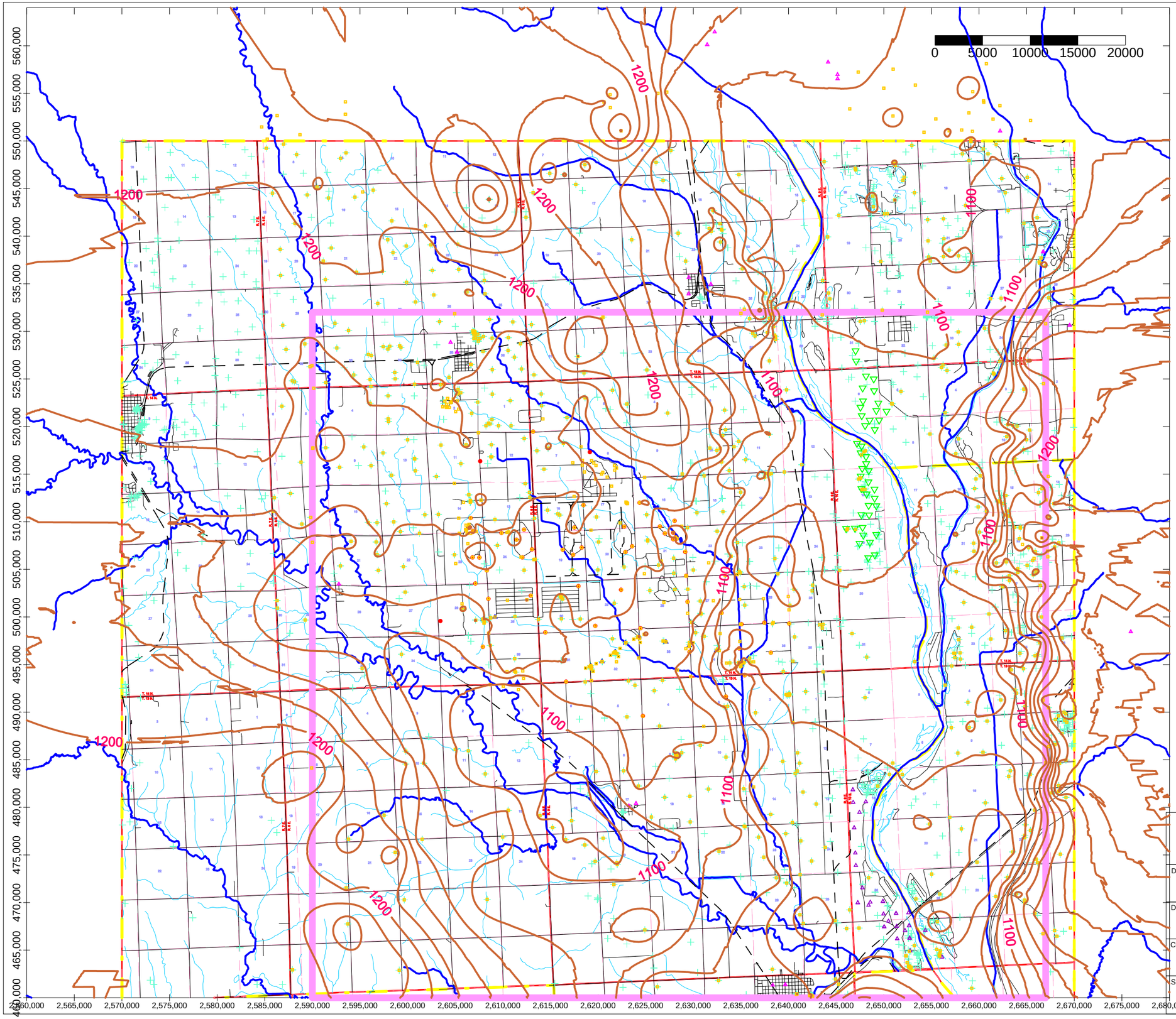
BEDROCK SURFACE ELEVATION

Scale: As Indicated

Date: May 2007

Fig. No.: 2-2

Figure Number: 2-2



Elevation of Base of Loess

Data Locations for Loess Contour

USACE Monitoring Well Locations

USACE Observation Wells (associated with Extraction Wells)

USACE Extraction Wells

Lower Platte North Natural Resource District Observation Wells

USGS Observation Wells

Lincoln Water Supply Well

Misc. Public Water Supply Well

Omaha Met. Utility Dist. (MUD) Water Supply Well

Registered Wells (as of Feb 2006)

Irrigation Well (Area of Interest Only)

GWM06 Model Extent

N

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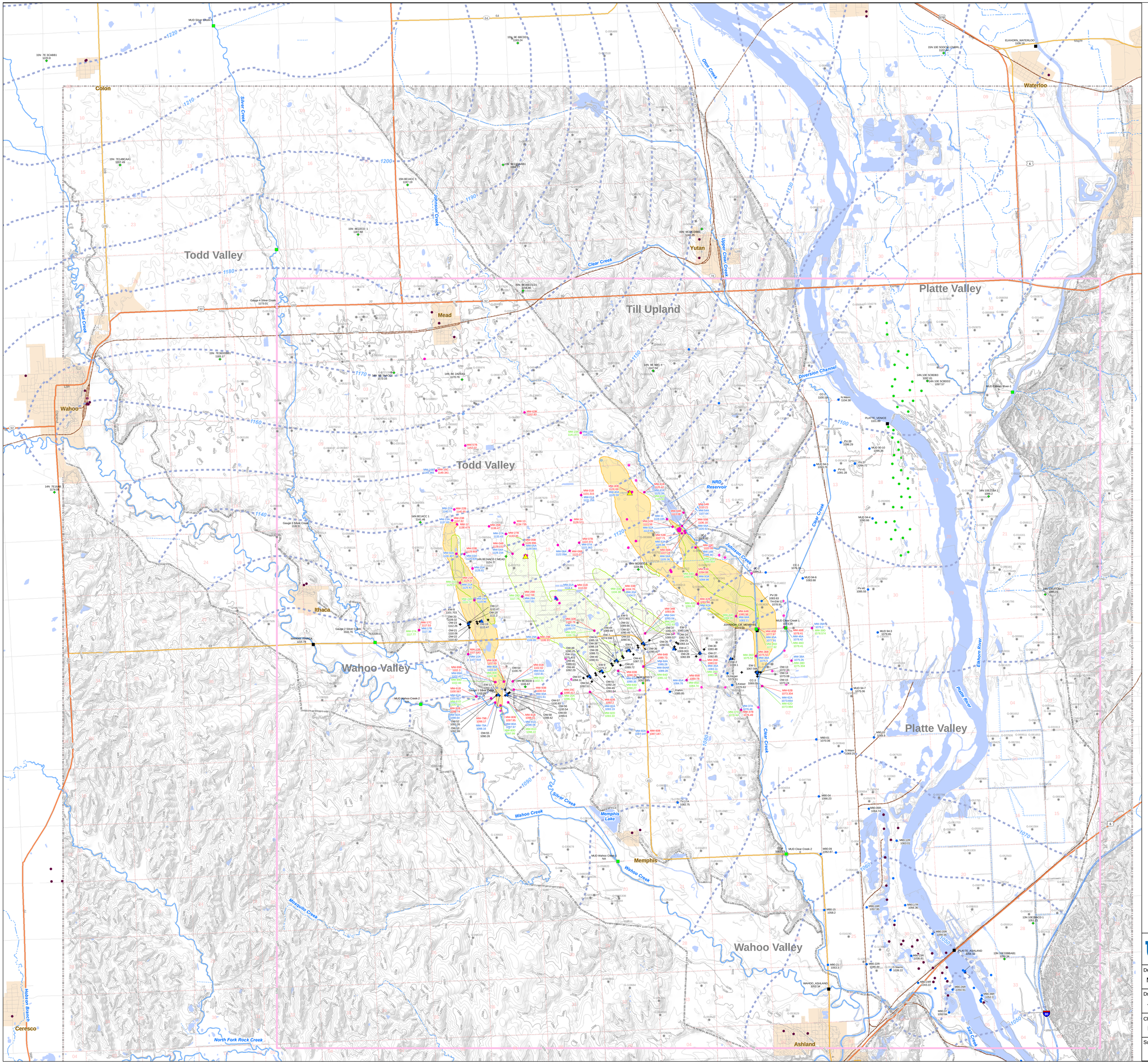
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

U.S. Army Corps of Engineers

ELEVATION OF BASE OF LOESS, FINE ALLUVIUM, OR TILL

Designed by:	M.E.W.
Drawn by:	M.E.W.
Checked by:	C.M.Z.
Submitted by:	L.A.T.
Scale:	As Indicated
Date:	May 2007
Fig. No.:	2-3
Figure Number:	2-3



Explanation

- USACE Extraction Well with GW elevation measured 3-29-2006 (feet NAVD88)
- Groundwater Circulation Well
- USACE Staff Gauge with Stream elevation measured Spring 2006 (feet NAVD88)
- Omaha Met. Utility Dist. Stream Elevation Measurement Location with Stream elevation measured Spring 2006 (feet NAVD88) NA = Not Available
- USGS Stream Elevation Measurement Location with Stream elevation measured Spring 2006 (feet NAVD88)
- Abandoned Monitoring Well
- USACE Monitoring Well with GW elevation measured 3-29-2006 (feet NAVD88)
- Lower Platte North Natural Resource District Observation Well with GW elevation measured Spring 2006 (feet NAVD88)
- USACE Observation Well with GW elevation measured 3-29-2006 (feet NAVD88)
- Omaha Met. Utility Dist. Waterr Supply Well (not measured)
- Other Municipal Water Supply Wells (not measured)
- USGS Observation Well with GW elevation measured Spring 2005 or Spring 2006 (feet NAVD88)
- USACE Monitoring Well Installed after October 2006
- Irrigation Well
- Interpreted Groundwater Elevation Contours March 2006 (feet NAVD88)
- Ground surface topography, 10' contour
- Index Topo_shp
- Model Extent
- RDX Plume 2006* (2 µg/L)
- TCE Plume 2006* (5 µg/L)
- Basin Boundaries

* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

USACE Monitoring Well Labels
Measured 3-29-2006
Groundwater elevations in feet (NAVD88)

MW-46B 1078.41 Shallow (red)
MW-46A 1078.42 Intermediate (blue)
MW-46D 1078.41 Deep (green)
OW-24 1082.79 Observation Well

N

0 3,000 6,000 Feet

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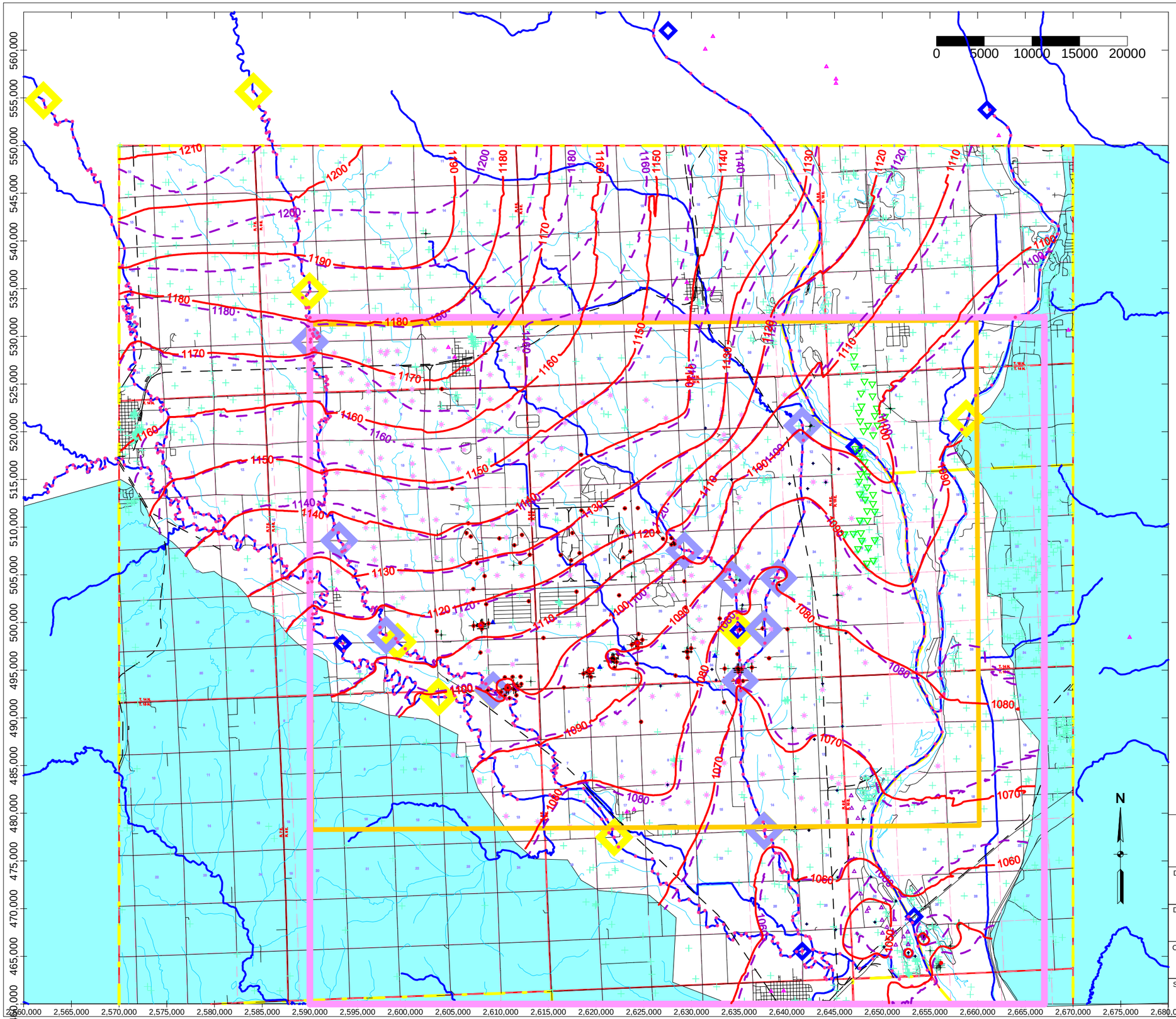
Drawn by: JLC
Checked by: MEW
Submitted by:

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

U.S. Army Corps of Engineers

Groundwater Elevations and Interpreted Potentiometric Surface, March 29, 2006

Scale:
Date: May 2007
Figure Number: 2-4
Fig: No.:



October 30, 2006 Interpreted Groundwater Contour (ft AMSL, NAVD88)

March 29, 2006 Interpreted Groundwater Contour (ft AMSL, NAVD88)

MUD March 2005 Manual Surface Water Measuement Locations

Manual Surface Water Measuement Locations

USGS Stream Gauge Locations

USACE Monitoring Well Locations

USACE Observation Wells (associated with Extraction Wells)

USACE Extraction Wells

Lower Platte North Natural Resource District Observation Wells

USGS Observation Wells

Lincoln Water Supply Well

Misc. Public Water Supply Well

Omaha Met. Utility Dist. (MUD) Water Supply Well

Registered Wells (as of Feb 2006)

Irrigation Well (Area of Interest Only)

RDGMIV Model Extent

GWM06 Model Extent

Inactive Areas for GWM06 Model, equivalent to loess-mantled till uplands.

River/Creek Segments Used in Interpolating River Stage Between Gauges

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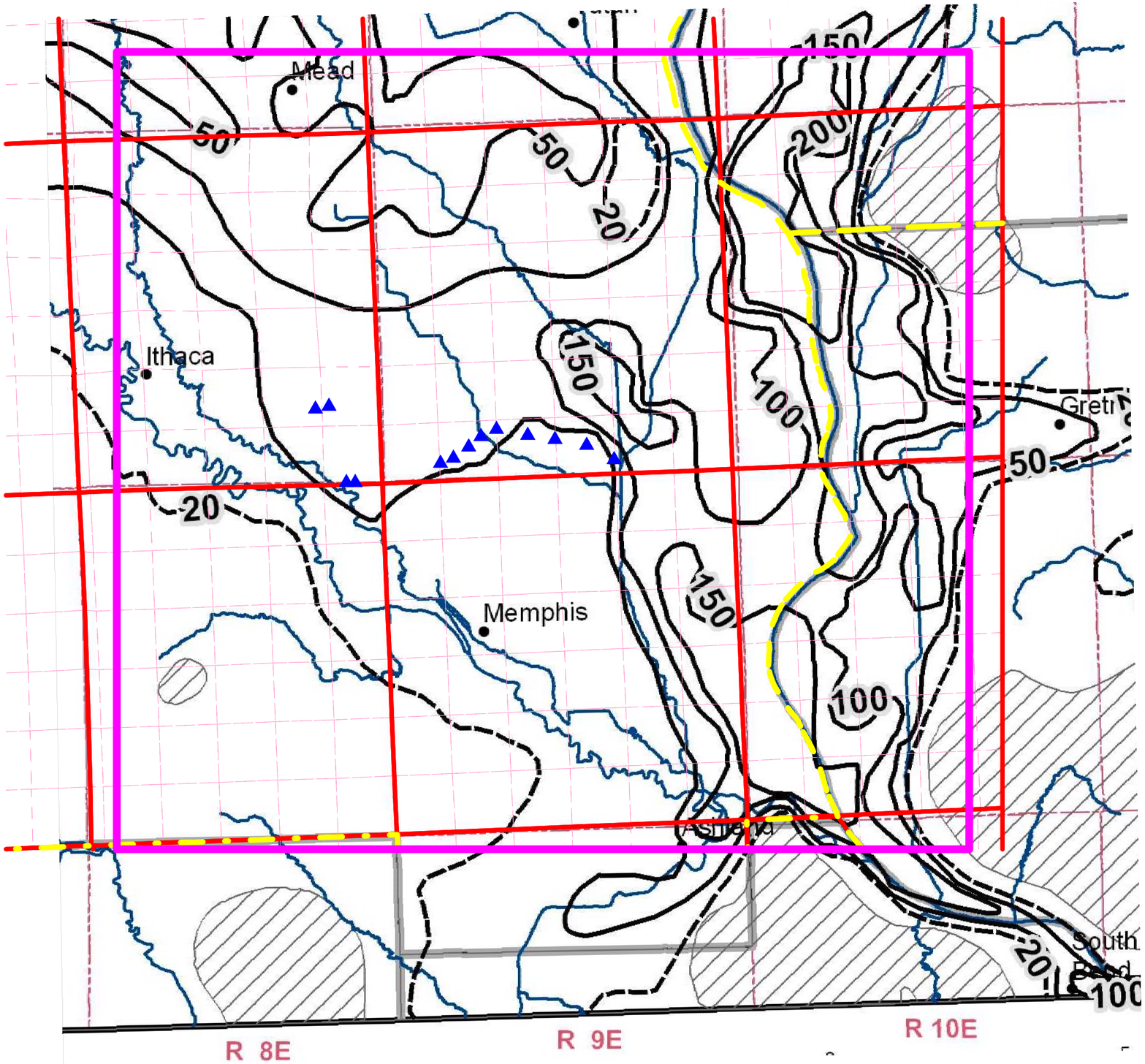
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

U.S. Army Corps of Engineers

Groundwater Elevations and Interpreted Potentiometric Surface, October 30, 2006

Designed by:	M.E.W.
Drawn by:	M.E.W.
Checked by:	C.M.Z.
Submitted by:	L.A.T.
Scale:	As Indicated
Date:	May 2007
Fig. No.:	2-5
Figure Number:	2-5



Transmissivity
gallons per day per foot (gpd/ft)

Principal aquifer absent
or very thin

GWM06 Model Extent

USACE Extraction Well

County Lines

NOTES:
1) Source: University of Nebraska, Conservation and Survey Division, Statewide Digital Databases, http://csd.unl.edu/general/gis-datasets.asp accessed Aug 2006.
2) Saturated thickness was based on water level data from 1995. Top of bedrock based on 1980 base of principal aquifer maps. Conductivities were estimated from lithologic descriptions from CSD test holes using the method of Reed and Piskin.
For more detail refer to CSD Open-file Report OFR-71.

Fig2-6 Transmissivity_20070522.srf

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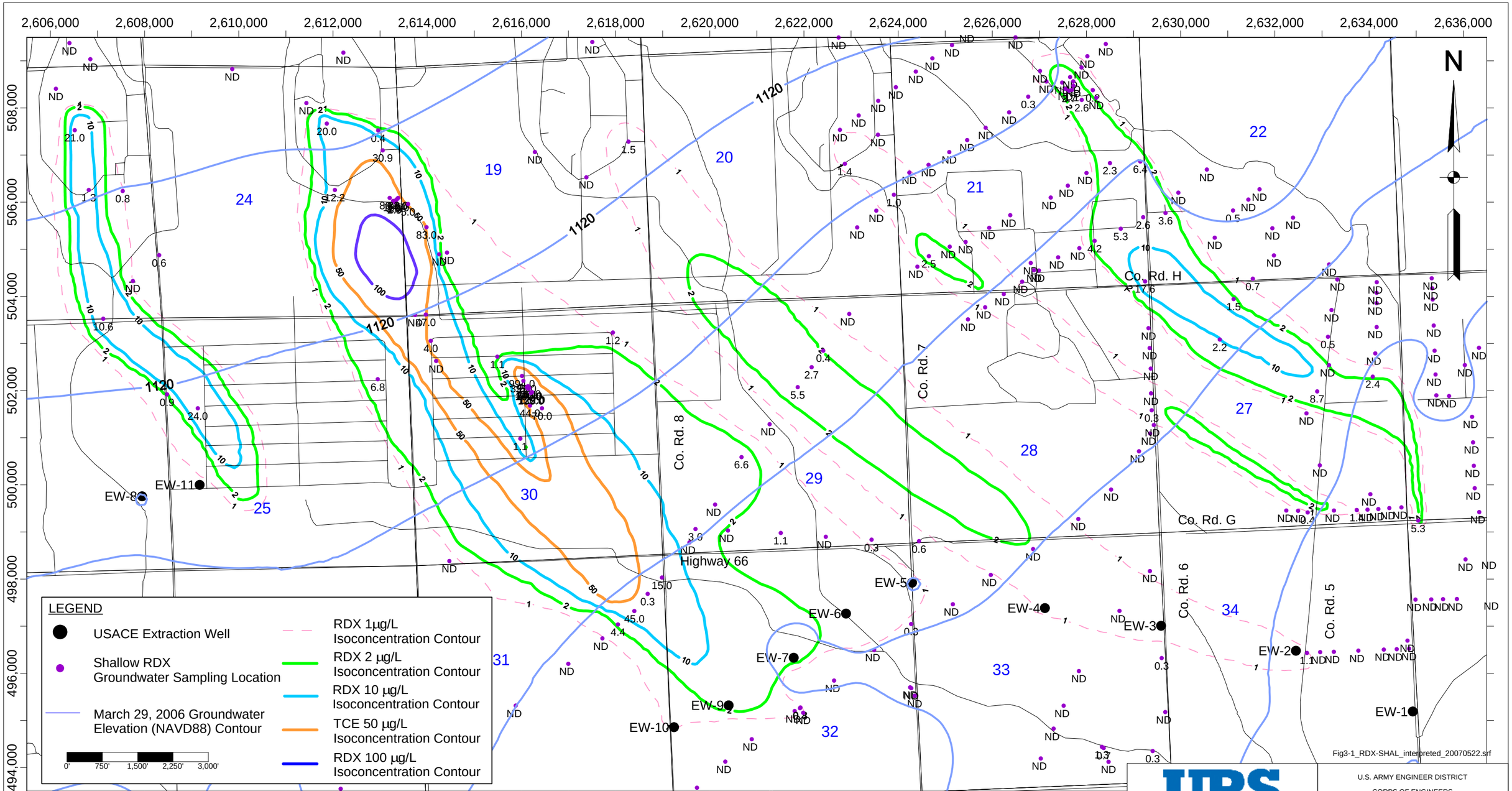
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

U.S. Army Corps of Engineers

"TRANSMISSIVITY OF PRINCIPAL AQUIFER"

Designed by:	M. E. W.
Drawn by:	M. E. W.
Checked by:	C. M. Z.
Submitted by:	L. A. T.
Scale:	As Indicated
Date:	May 2007
Fig. No.:	2-6
Figure Number:	2-6



NOTES:

1) "Shallow" direct push samples were collected the upper half of the saturated thickness of the unconsolidated aquifer, where it is unconfined, or in the upper half of the aquifer where it is confined. "Intermediate" samples were collected in the lower half. If more than one direct-push sample was collected in one half of the aquifer, the highest concentration is presented.

2) Concentrations are the most recent monitoring well or direct-push samples.

3) The majority of the monitoring well samples, including all of the leading edge and downgradient samples, were collected in March 2006. Some samples, particularly upgradient or inside the load lines, were last sampled as early as the mid-1990s, and likely over-represent the current concentrations. in the upgradient portions of the plumes. Refer to table 3-1 for specific dates.

4) The direct-push samples were collected as part of either the EW-11 LL1 investigation (2004) or the Fall 2005 and Spring 2006 Groundwater Investigations. Refer to table 3-1 for specific dates.

5) Low or non-detect concentrations in the middle of plumes (i.e., both upgradient and downgradient of detected concentrations), were assumed to be anomalous for the purpose of representing a contiguous plume extent and a conservative plume mass for the purposes of transport simulation.

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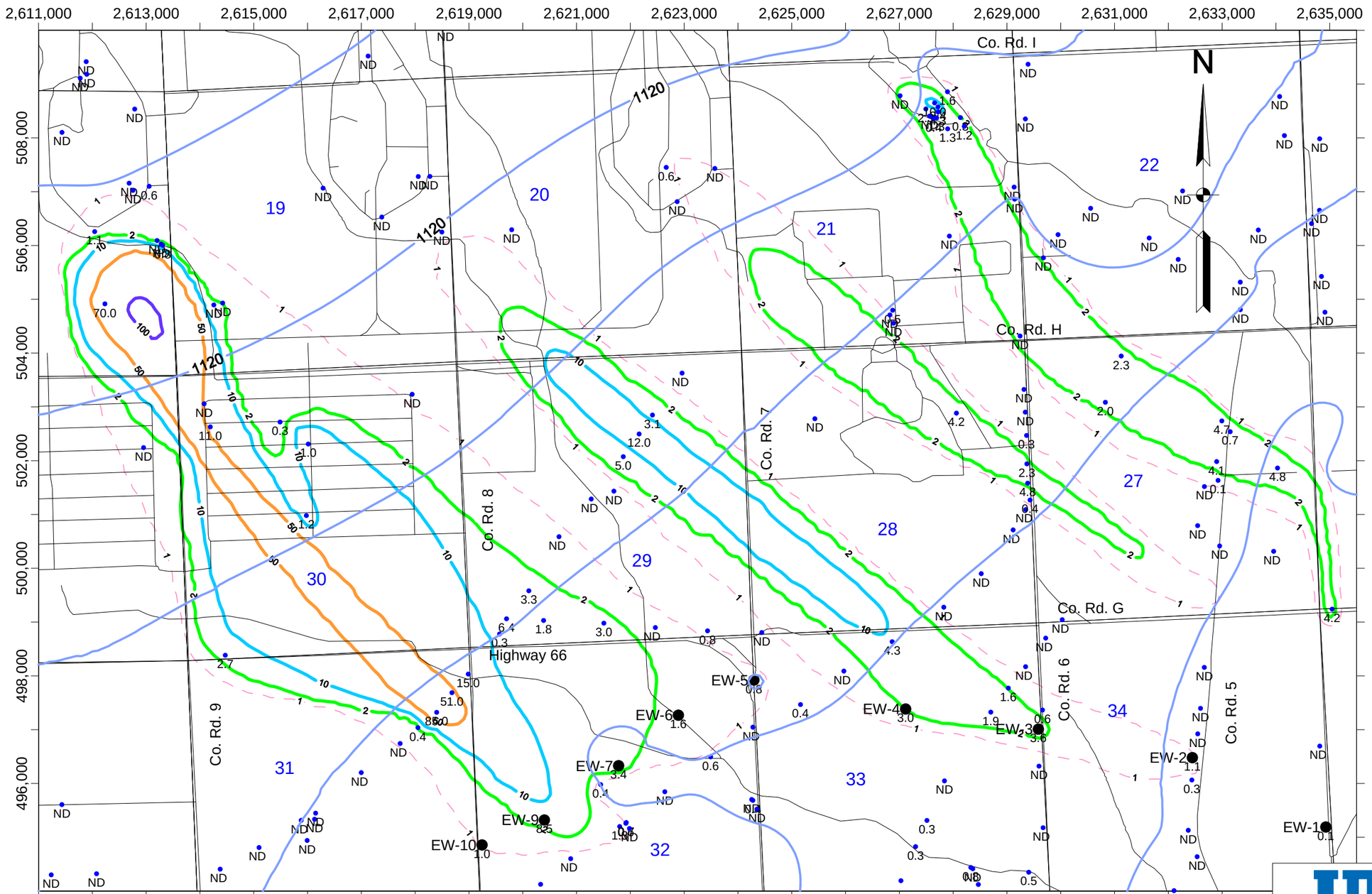
Designed by: M.E.W.
Drawn by: M.E.W.
Checked by: R.J.E.
Submitted by: L.A.T.

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

RDX IN SHALLOW MONITORING WELLS AND DIRECT-PUSH SAMPLES

Scale: As Indicated
Date: May 2007
Fig. No.: 3-1
Figure Number: 3-1



LEGEND

- USACE Extraction Well
- Intermediate RDX Groundwater Sampling Location
- March 29, 2006 Groundwater Elevation (NAVD88) Contour
- RDX 1µg/L Isoconcentration Contour
- RDX 2 µg/L Isoconcentration Contour
- RDX 10 µg/L Isoconcentration Contour
- TCE 50 µg/L Isoconcentration Contour
- RDX 100 µg/L Isoconcentration Contour

0' 750' 1,500' 2,250' 3,000'

Fig3-2_RDX-INTER_interpreted_20070523.srf

NOTES:

1) "Shallow" direct push samples were collected the upper half of the saturated thickness of the unconsolidated aquifer, where it is unconfined, or in the upper half of the aquifer where it is confined. "Intermediate" samples were collected in the lower half. If more than one direct-push sample was collected in one half of the aquifer, the highest concentration is presented.

2) Concentrations are the most recent monitoring well or direct-push samples.

3) The majority of the monitoring well samples, including all of the leading edge and downgradient samples, were collected in March 2006. Some samples, particularly upgradient or inside the load lines, were last sampled as early as the mid-1990s, and likely over-represent the current concentrations. in the upgradient portions of the plumes. Refer to table 3-2 for specific dates.

4) The direct-push samples were collected as part of either the EW-11 LL1 investigation (2004) or the Fall 2005 and Spring 2006 Groundwater Investigations. Refer to table 3-2 for specific dates.

5) Low or non-detect concentrations in the middle of plumes (i.e., both upgradient and downgradient of detected concentrations), were assumed to be anomalous for the purpose of representing a contiguous plume extent and a conservative plume mass for the purposes of transport simulation.

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Checked by: R.J.E.
Submitted by: L.A.T.

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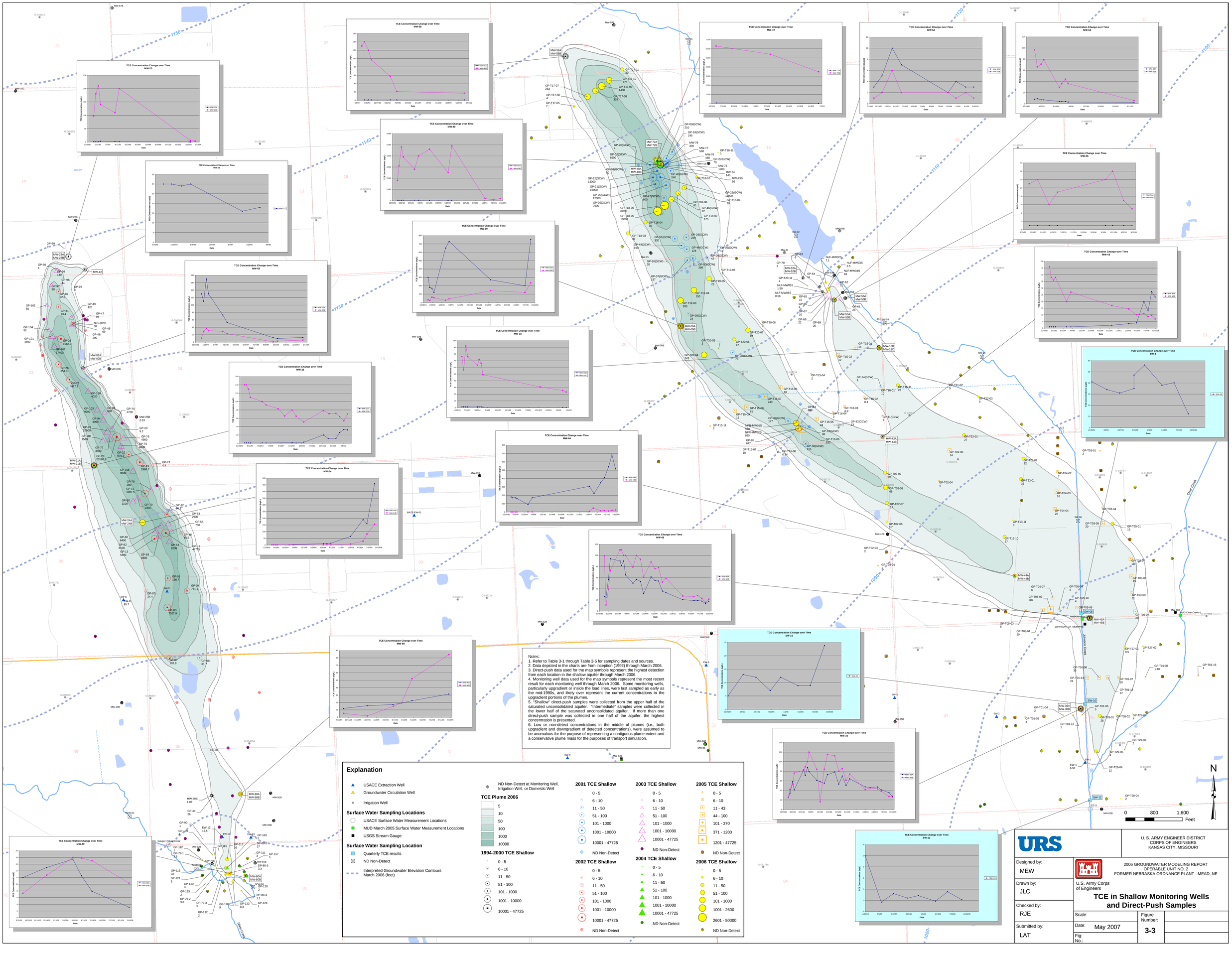
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

RDX IN INTERMEDIATE MONITORING WELLS AND DIRECT-PUSH SAMPLES

Scale: As Indicated
Date: May 2007
Fig. No.: 3-2
Figure Number: 3-2



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Designed by: MEW

Drawn by: JLC

Checked by: RJE

Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

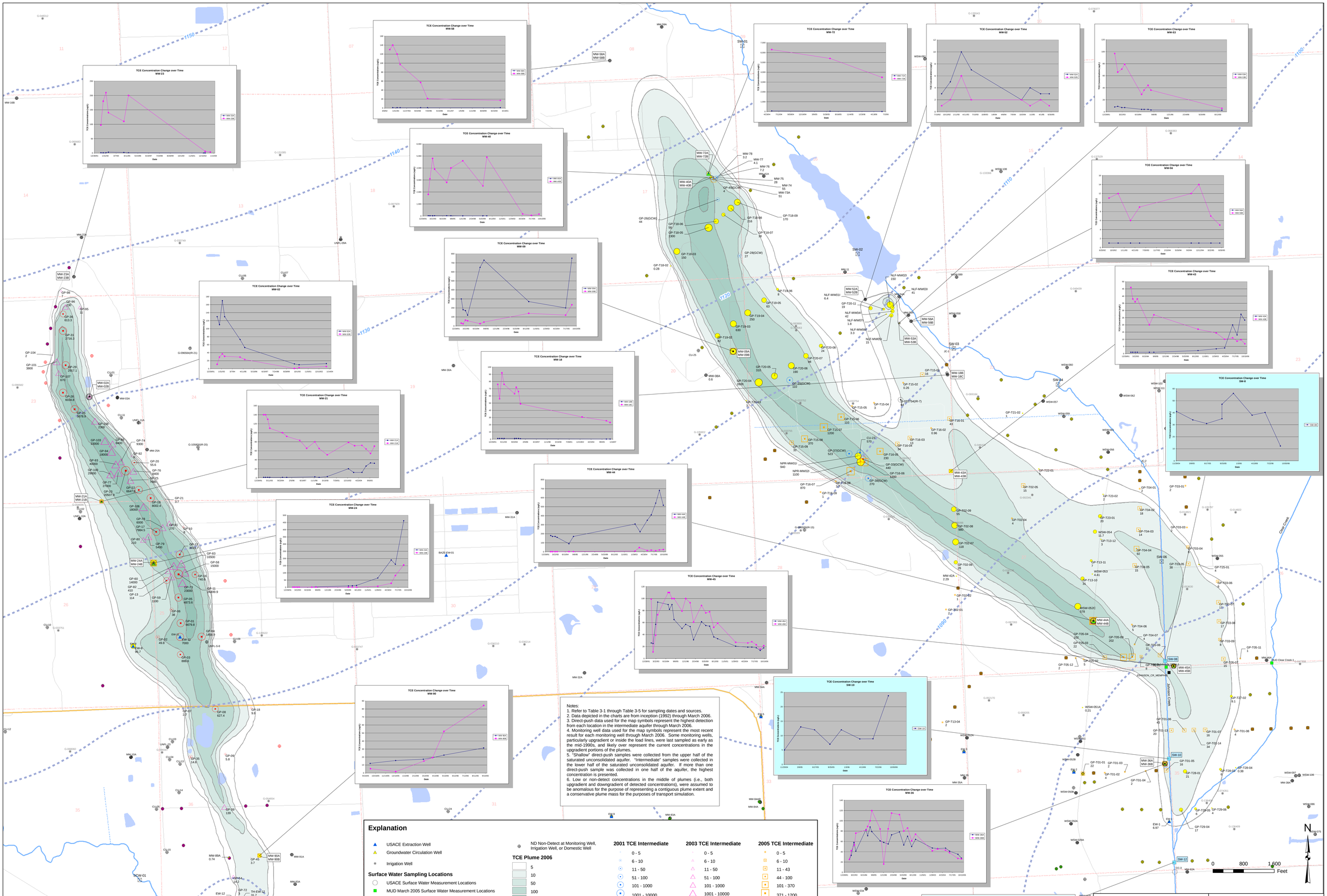
TCE in Shallow Monitoring Wells and Direct-Push Samples

Scale:

Date: May 2007

Fig. No.:

Figure Number: 3-3


TCE Concentration Change over Time
MW-23
MW-58
MW-40
MW-72
MW-52
MW-53
MW-56
MW-02
MW-09
MW-18
MW-21
MW-44
MW-24
MW-45
MW-43
SW-8
SW-10
SW-12
Notes:
1. Refer to Table 3-1 through Table 3-5 for sampling dates and sources.
2. Data depicted in the charts are from inception (1992) through March 2006.
3. Direct-push data used for the map symbols represent the highest detection from each location in the intermediate aquifer through March 2006.
4. Monitoring well data used for the map symbols represent the most recent result for each monitoring well through March 2006. Some monitoring wells, particularly upgradient or inside the load lines, were last sampled as early as the mid-1990s, and likely over represent the current concentrations in the upgradient portions of the plumes.
5. "Shallow" direct-push samples were collected from the upper half of the saturated unconsolidated aquifer. "Intermediate" samples were collected in the lower half of the saturated unconsolidated aquifer. If more than one direct-push sample was collected in one half of the aquifer, the highest concentration is presented.
6. Low or non-detect concentrations in the middle of plumes (i.e., both upgradient and downgradient of detected concentrations), were assumed to be anomalous for the purpose of representing a contiguous plume extent and a conservative plume mass for the purposes of transport simulation.
Explanation
USACE Extraction Well
Groundwater Circulation Well
Irrigation Well
Surface Water Sampling Locations
USACE Surface Water Measurement Locations
MUD March 2005 Surface Water Measurement Locations
USGS Stream Gauge
Surface Water Sampling Location
Quarterly TCE results
ND Non-Detect
Interpreted Groundwater Elevation Contours March 2006 (feet)
ND Non-Detect at Monitoring Well, Irrigation Well, or Domestic Well
TCE Plume 2006
5
10
50
100
1000
10000
1994-2000 TCE Intermediate
0 - 5
6 - 10
11 - 50
51 - 100
101 - 1000
1001 - 10000
10001 - 47725
ND Non-Detect
2001 TCE Intermediate
0 - 5
6 - 10
11 - 50
51 - 100
101 - 1000
1001 - 10000
10001 - 47725
ND Non-Detect
2002 TCE Intermediate
0 - 5
6 - 10
11 - 50
51 - 100
101 - 1000
1001 - 10000
10001 - 47725
ND Non-Detect
2003 TCE Intermediate
0 - 5
6 - 10
11 - 50
51 - 100
101 - 1000
1001 - 10000
10001 - 47725
ND Non-Detect
2004 TCE Intermediate
0 - 5
6 - 10
11 - 50
51 - 100
101 - 1000
1001 - 10000
10001 - 47725
ND Non-Detect
2005 TCE Intermediate
0 - 5
6 - 10
11 - 43
44 - 100
101 - 370
371 - 1200
1201 - 47725
ND Non-Detect
2006 TCE Intermediate
0 - 5
6 - 10
11 - 50
51 - 100
101 - 1000
1001 - 2600
2601 - 50000
ND Non-Detect
0 800 1,600 Feet
N
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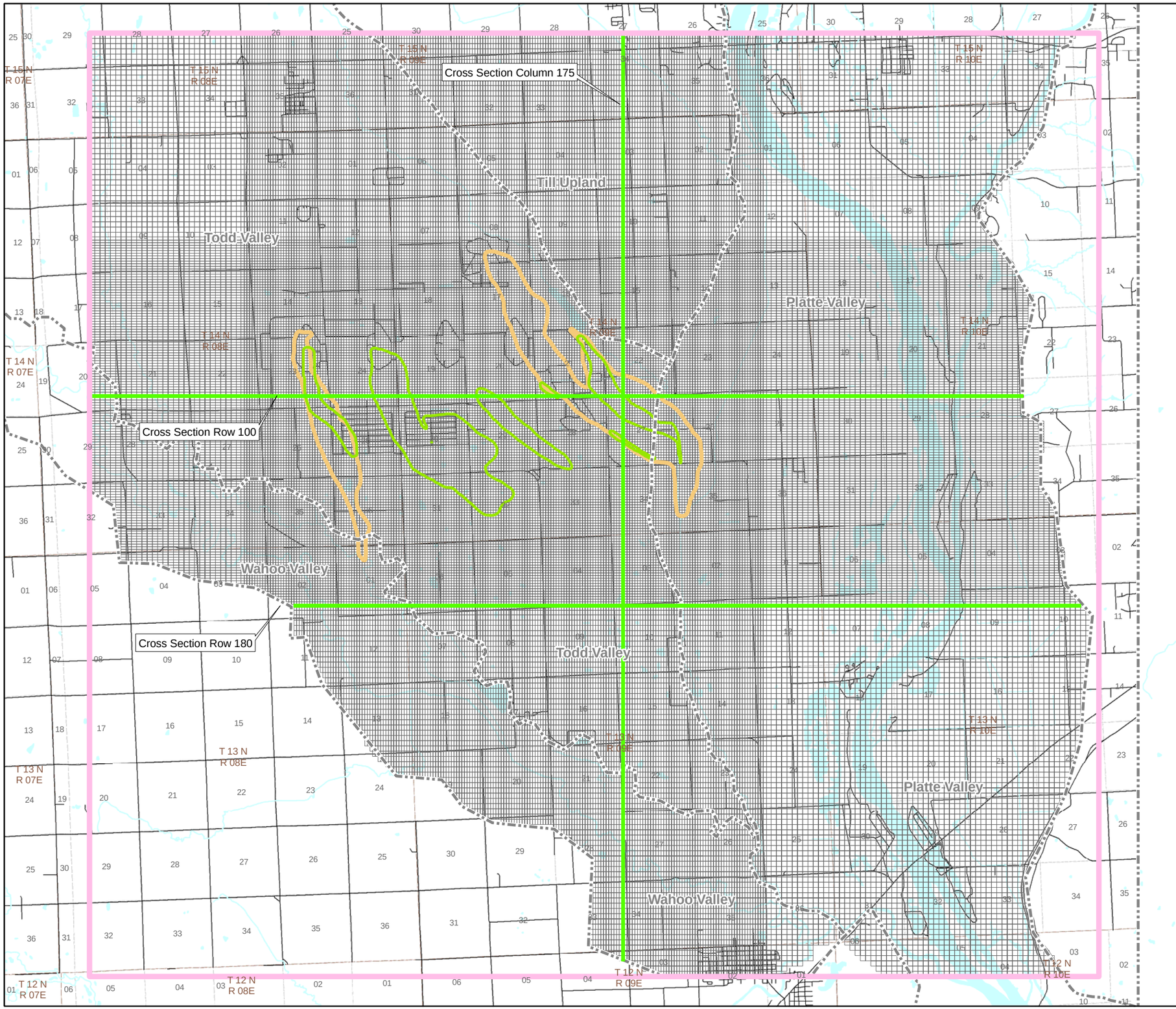
Designed by: MEW
Drawn by: JLC
Checked by: RJE
Submitted by: LAT
U.S. Army Corps of Engineers
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE
TCE in Intermediate Monitoring Wells and Direct-Push Samples
Scale:
Date: May 2007
Figure Number: 3-4
Fig: No.:



Explanation

- Model Domain
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)
- Basin Boundaries
- Model Grid

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Grid cells shown are the coarse grid.

N

0 7,500 15,000 Feet

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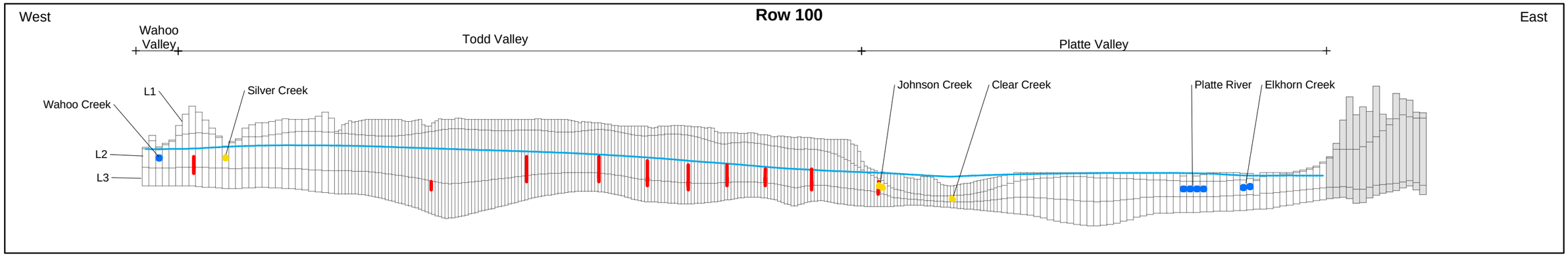
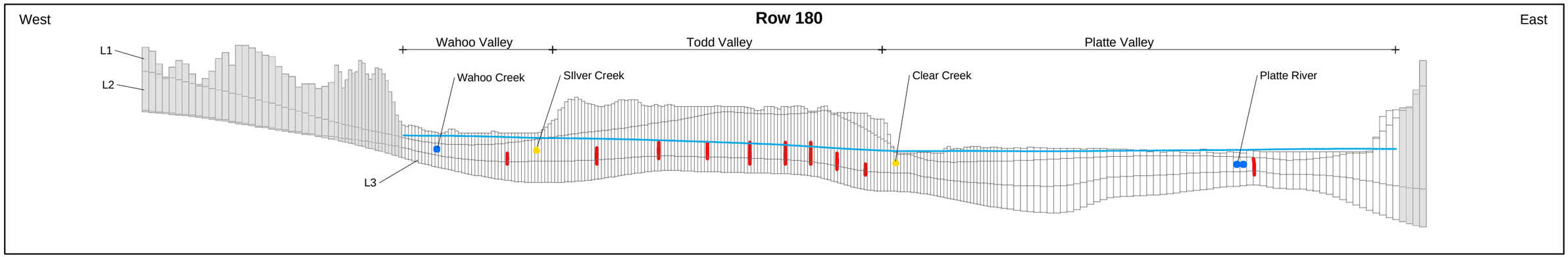
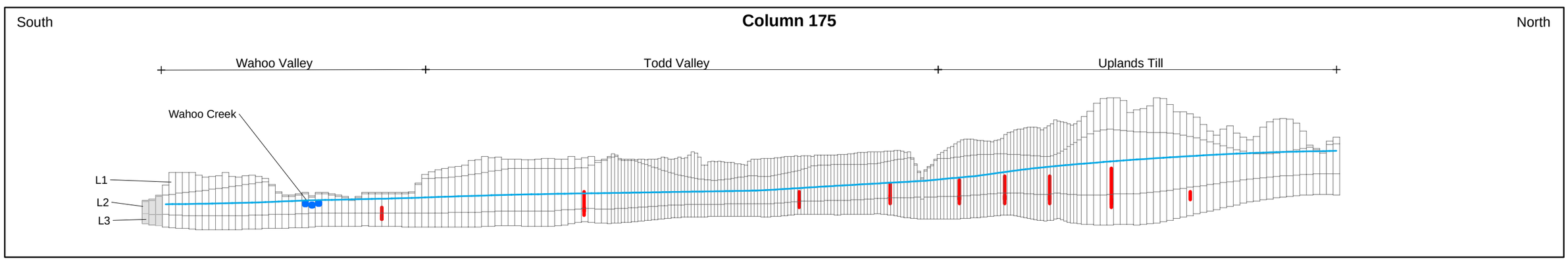
Drawn by: JLC	2006 GROUNDWATER MODELING REPORT OPERABLE UNIT NO. 2 FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE
Checked by: MEW	**Model Domain and Grid**
Submitted by: LAT	Scale: / Date: May 2007 / Fig: No.: / Figure Number: **4-1**







Explanation

- Stream (Drain) Cross-section
- River Cross-section
- Extraction Well
- Grid
- Water Table
- No Flow

0 6,000 12,000 Feet

Horizontal scale

Note:
Grid cells shown are the coarse grid.

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2006 GROUNDWATER MODELING REPORT
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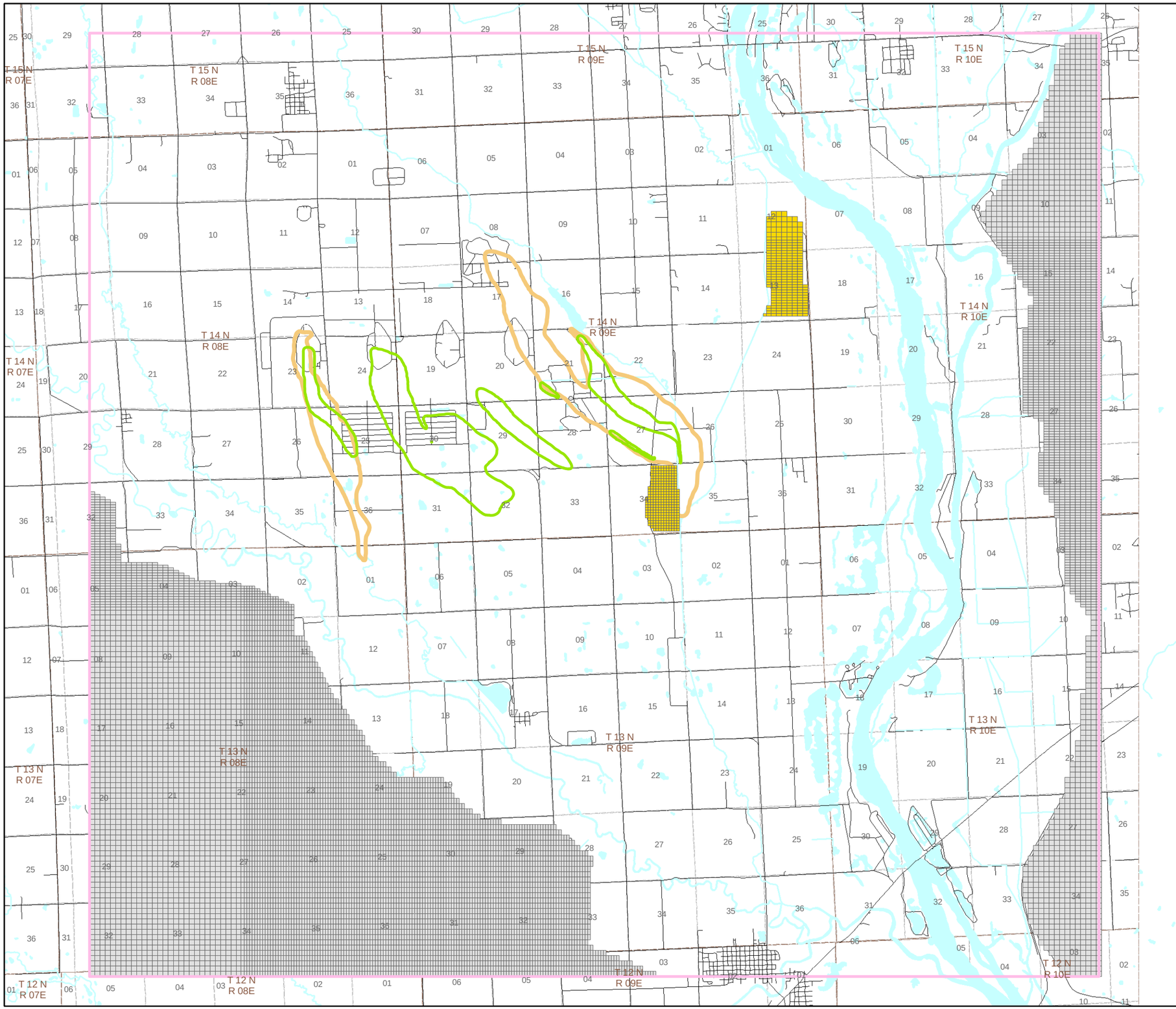
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Cross-Section View of Model Layers

Designed by:	CMZ
Drawn by:	JLC
Checked by:	MEW
Submitted by:	LAT
Scale:	
Date:	May 2007
Fig: No.:	
Figure Number:	4-2



Explanation

Model Domain

Model Boundary Conditions

- Agriculture Drain Tiles (Drain Cell)
- No Flow
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Grid cells shown are the coarse grid.

N

0 7,500 15,000 Feet

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2006 GROUNDWATER MODELING REPORT
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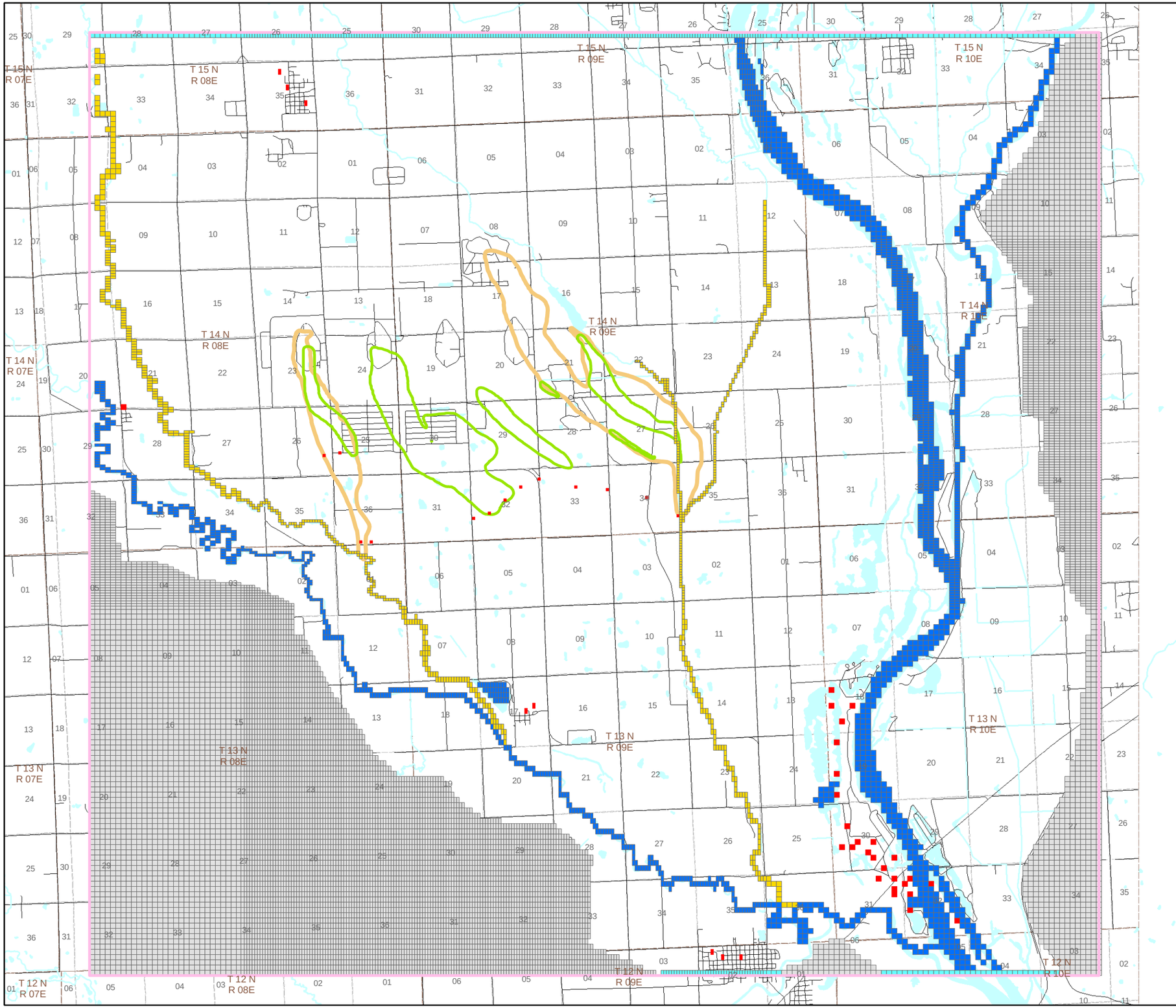
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Model Boundary Conditions, Layer 1

Designed by:	CMZ
Drawn by:	JLC
Checked by:	MEW
Submitted by:	LAT
Scale:	
Date:	May 2007
Fig: No.:	
Figure Number:	4-3



Explanation

Model Domain

Model Boundary Conditions

- Stream (Drain Cell)
- General Head Boundary
- River
- Extraction Well
- No Flow
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Grid cells shown are the coarse grid.

N

0 7,500 15,000 Feet

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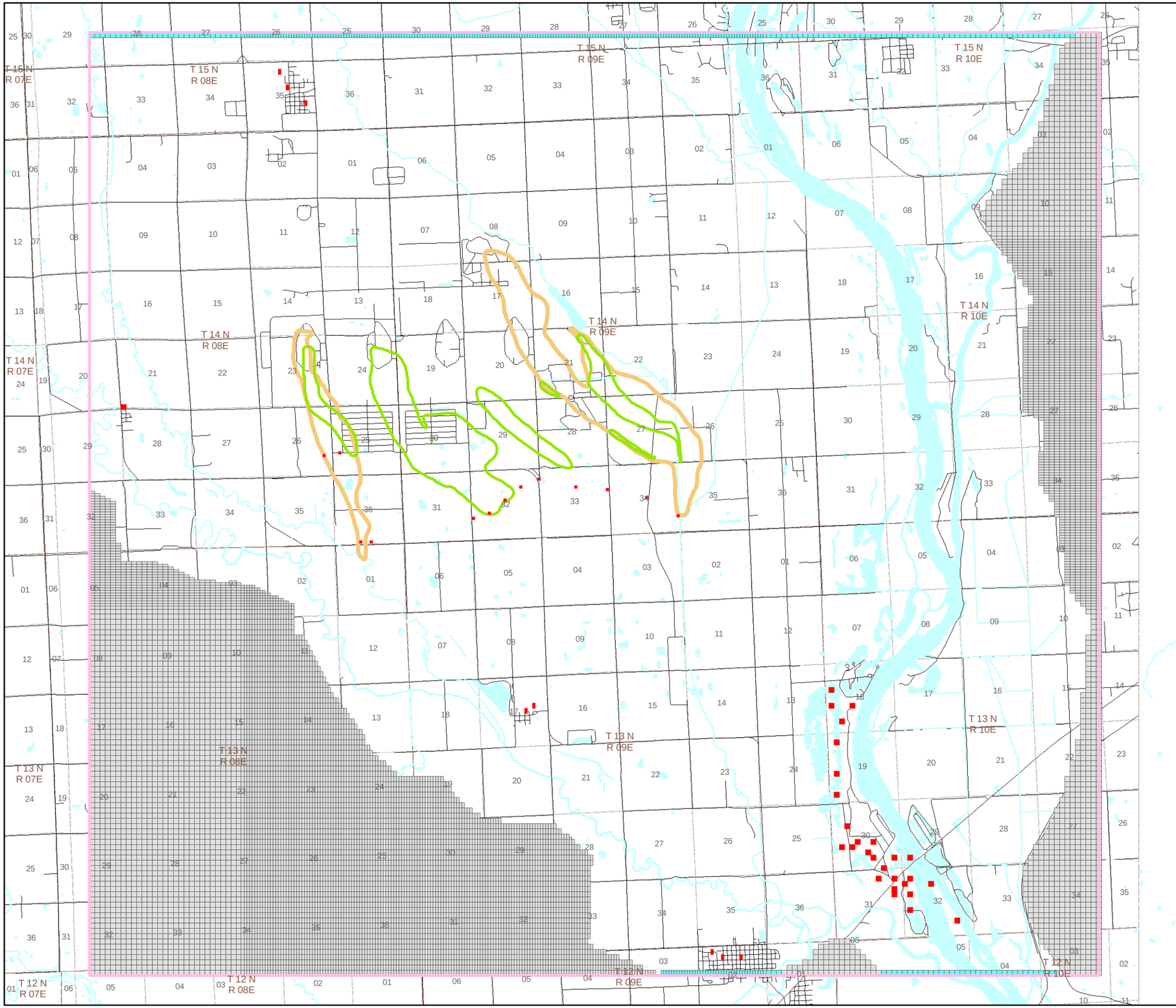
Drawn by: JLC	U.S. Army Corps of Engineers
Checked by: MEW	**Model Boundary Conditions, Layer 2**
Submitted by: LAT	Scale: / Date: May 2007 / Fig: No.: / Figure Number: **4-4**



Explanation

Model Domain

Model Boundary Conditions

- General Head Boundary
- Extraction Well
- No Flow
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Grid cells shown are the coarse grid.

N

0 7,500 15,000 Feet

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Drawn by: JLC	U.S. Army Corps of Engineers
Checked by: MEW	**Model Boundary Conditions, Layer 3**
Submitted by: LAT	Scale: / Date: May 2007 / Fig: No.: / Figure Number: **4-5**

Figure 5.2-1
Simulated versus Observed Hydraulic Heads of March 29, 2006
Steady State Calibration Results
Former Nebraska Ordnance Plant, Mead, Nebraska

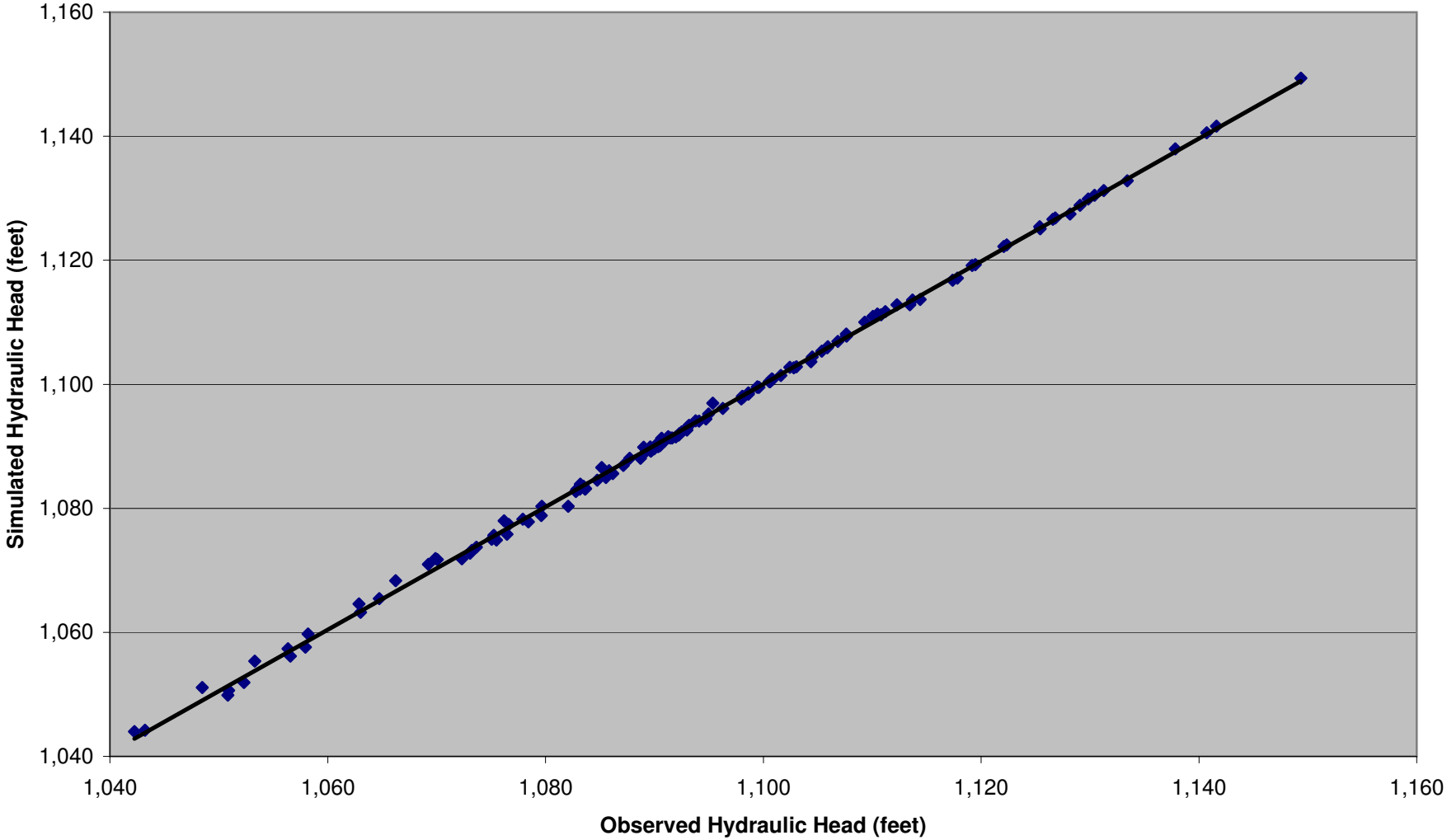
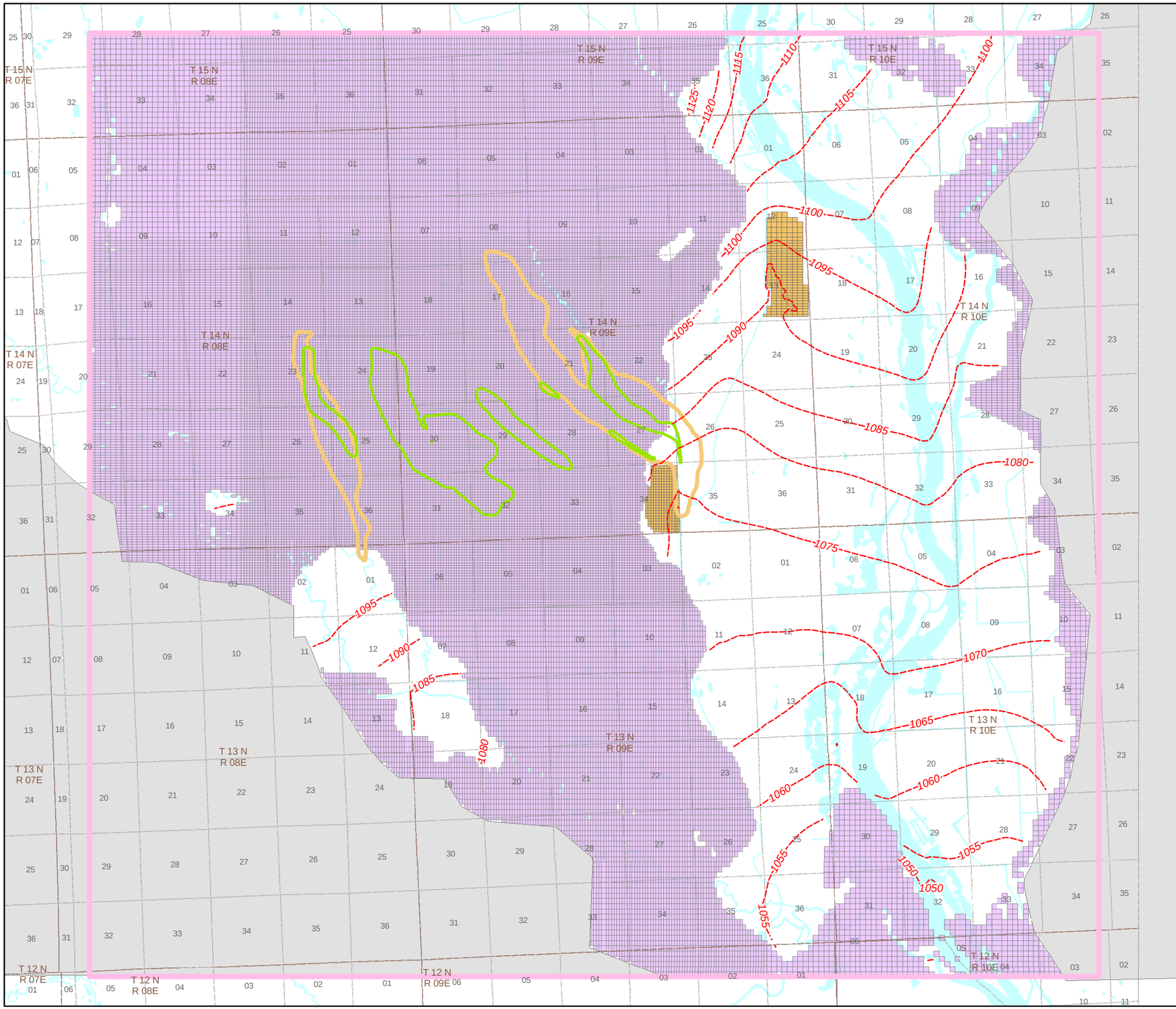


Fig 5.2-1 Comparison of Simulated and OBS.xls 5/30/2007



Explanation

- Model Domain
- Simulated Potentiometric Surface, Layer 1
- Inactive Areas, equivalent to loess-mantled till uplands
- Dry Cell - indicates unsaturated condition
- Agricultural Drain
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Grid cells shown are the coarse grid.

N

0 7,500 15,000 Feet

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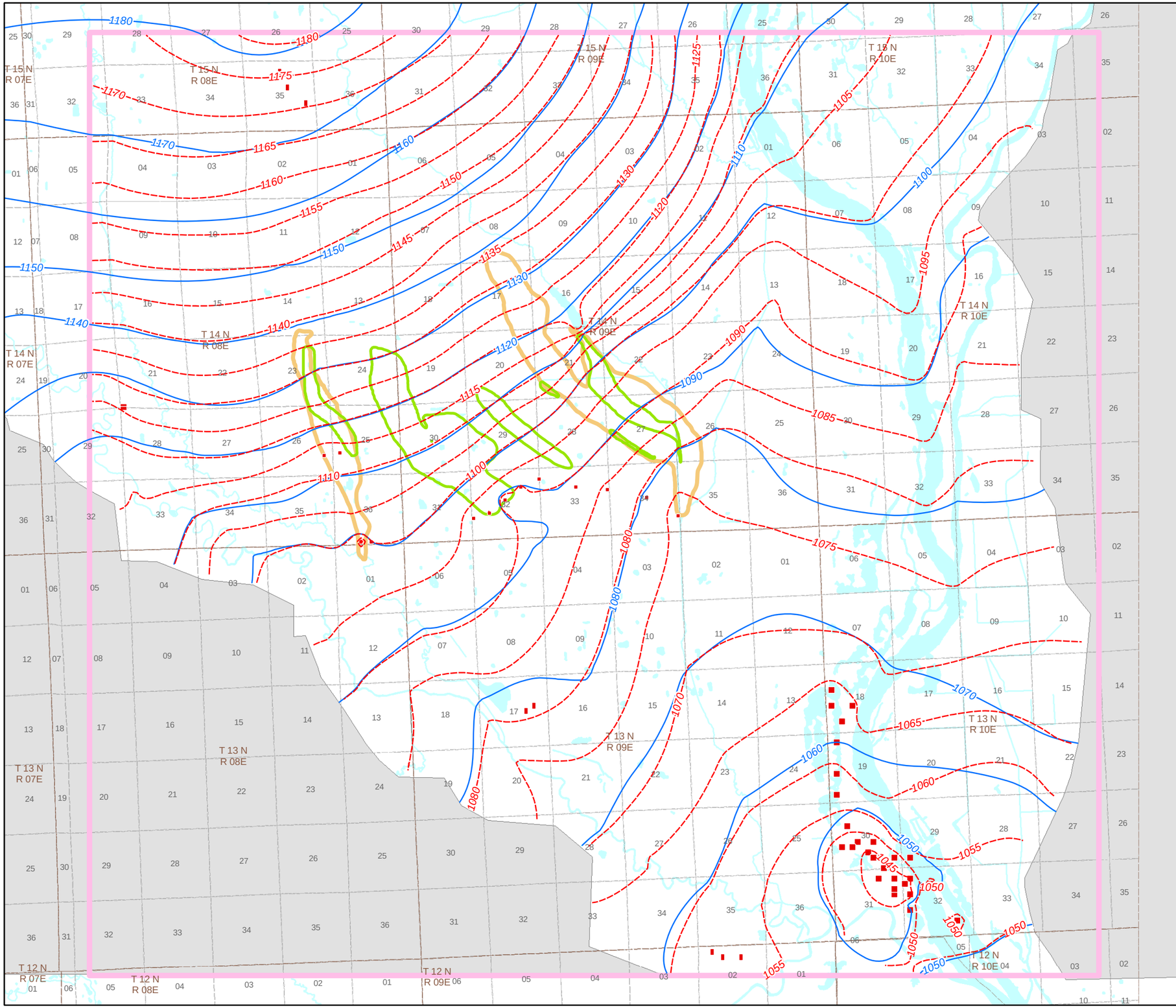
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Simulated Potentiometric Surface of Layer 1, March 2006

Designed by:	CMZ
Drawn by:	JLC
Checked by:	MEW
Submitted by:	LAT
Scale:	
Date:	May 2007
Fig: No.:	
Figure Number:	5.2-2



Explanation

- Extraction Well
- Simulated Potentiometric Surface, Layer 2/3
- Model Domain
- Interpreted Groundwater Elevation Contours March 2006 (feet)
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)
- Inactive Areas, equivalent to loess-mantled till uplands

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 7,500 15,000 Feet

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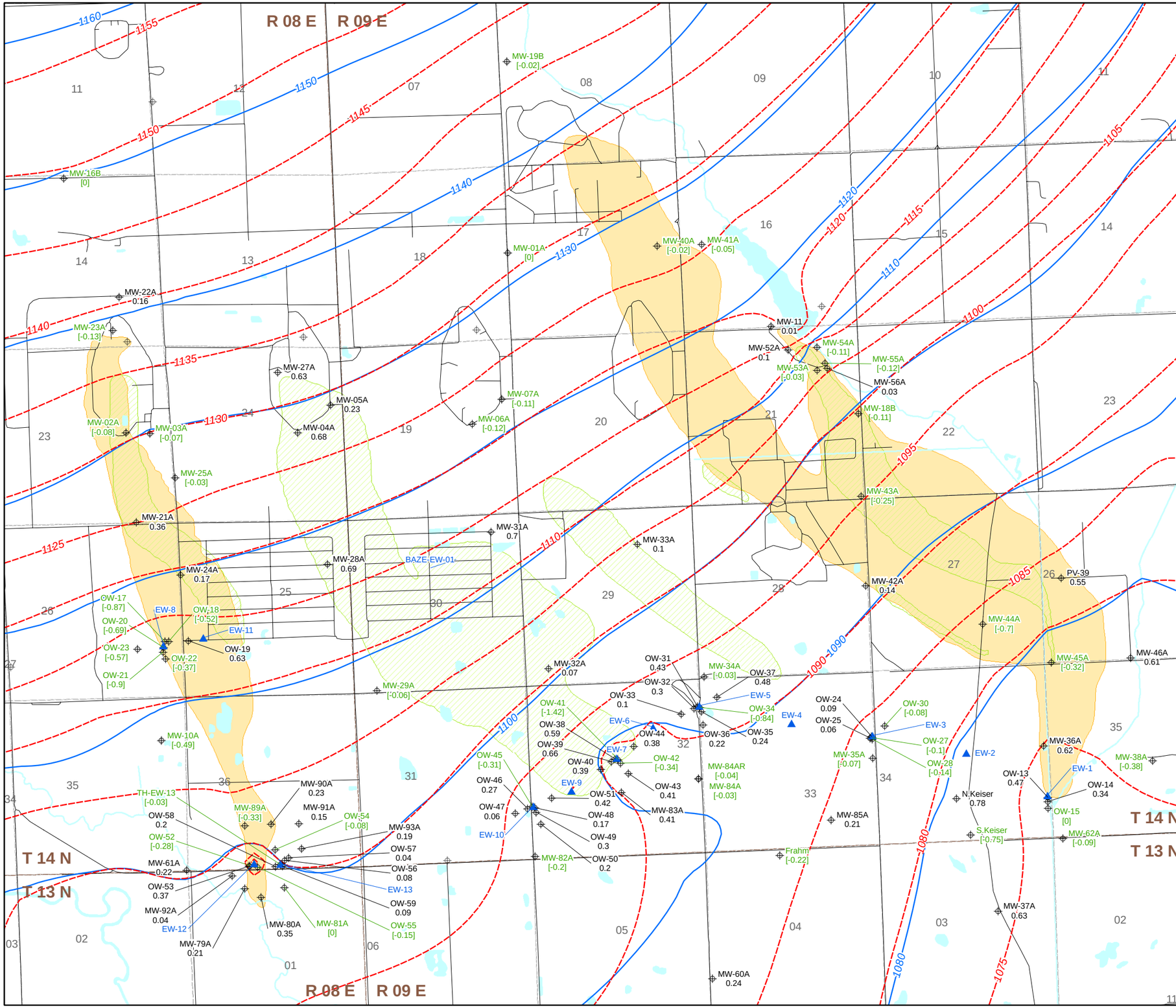
Drawn by: JLC	U.S. Army Corps of Engineers
Checked by: MEW	**Simulated and Interpreted Potentiometric Surfaces in Entire Model Domain, March 2006**
Submitted by: LAT	Scale: / Date: May 2007 / Fig: No.: / Figure Number: **5.2-3**



Explanation

MW-90A 0.48 — Well Location Residual > 0 (Observed head - simulated head)

MW-81A [-0.01] — Well Location Residual < 0 (Observed head - simulated head)

▲ USACE Extraction Well

Interpreted Groundwater Elevation Contours March 2006 (feet)

Simulated Potentiometric Surface, Layer 2/3

TCE Plume 2006* (5 µg/L)

RDX Plume 2006* (2 µg/L)

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 3,000 6,000 Feet

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Drawn by: JLC

Checked by: MEW

Submitted by: LAT

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2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

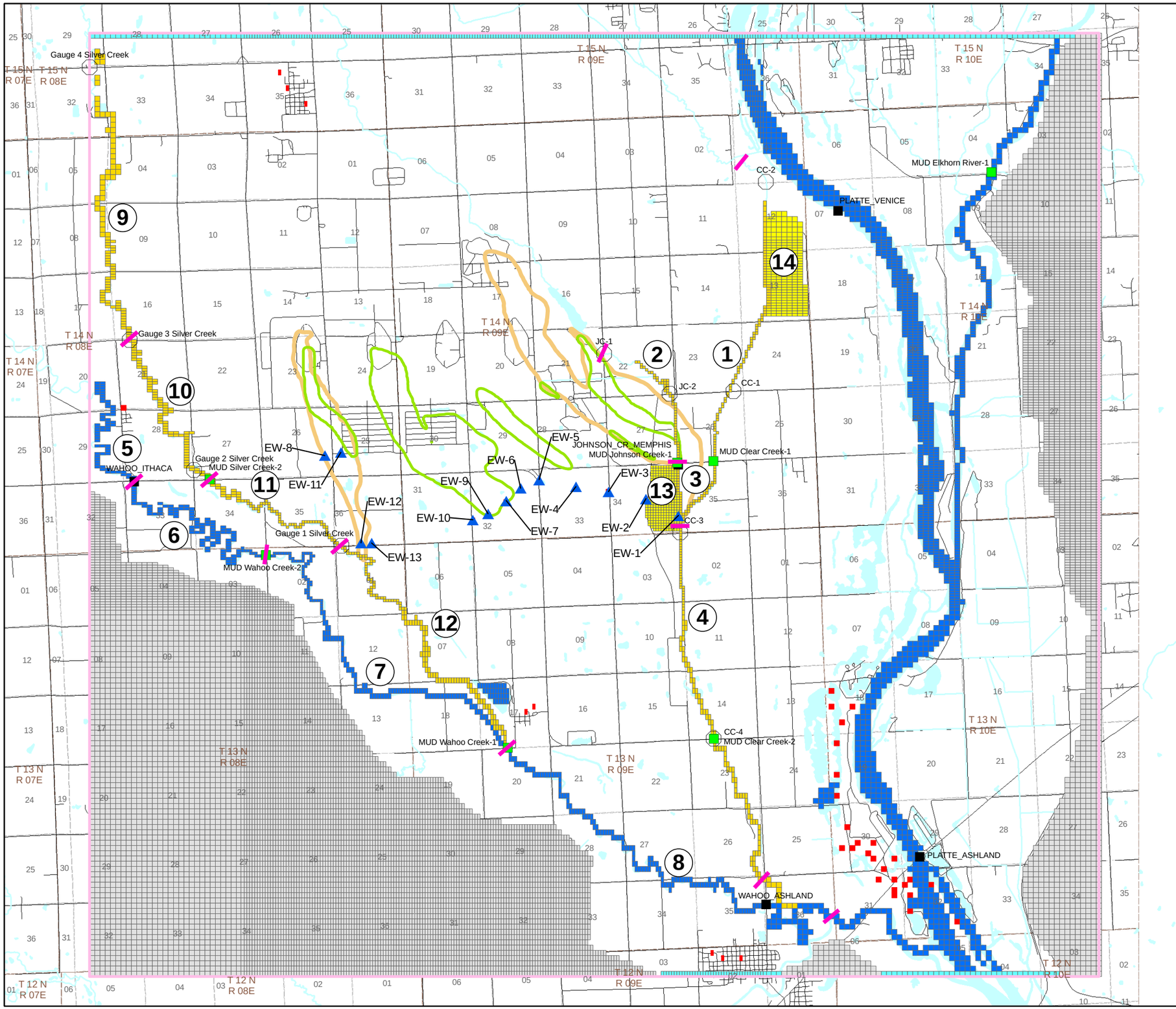
Simulated and Interpreted Potentiometric Surfaces in the Plume Area, March 2006

Scale:

Date: May 2007

Figure Number: 5.2-4

Fig: No.:



Explanation

USACE Extraction Well

Model Boundary Conditions

- Stream (Drain Cell)
- General Head Boundary
- River
- Water Supply Pumping Well
- No Flow
- Agriculture Drain Tiles (Drain Cell)
- Model Domain
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)
- Stream Section End Markers

Stream Sections and Drains as presented in Table 5-4

1) Clear Creek upstream of Johnson Creek
2) Johnson Creek above USGS gauge
3) Johnson Creek between USGS gauge and Clear Creek
4) Clear Creek downstream of Johnson Creek
5) Wahoo Creek above Ithaca
6) Wahoo Creek between Gauge 2 and Ithaca
7) Wahoo Creek between Gauge 1 and Gauge 2
8) Wahoo Creek between Ashland and Gauge 1
9) Silver Creek upstream of Gauge 3
10) Silver Creek between Gauge 3 and Gauge 2
11) Silver Creek between Gauge 2 and Gauge 1
12) Silver Creek between Gauge 1 and confluence with Wahoo Creek
13) Agricultural Drain in section 34 at Johnson Creek
14) Agricultural Drain in section 13 at Clear Creek

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

Grid cells shown are the coarse grid.

N

0 7,500 15,000 Feet

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Drawn by: JLC
Checked by: MEW
Submitted by: LAT

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2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Simulated Stream-Aquifer Interaction Locations

Scale:
Date: May 2007
Fig. No.:
Figure Number: 5.2-5

Figure 5.2-6
Verification of Steady State Model
Using Observed Heads on October 30, 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

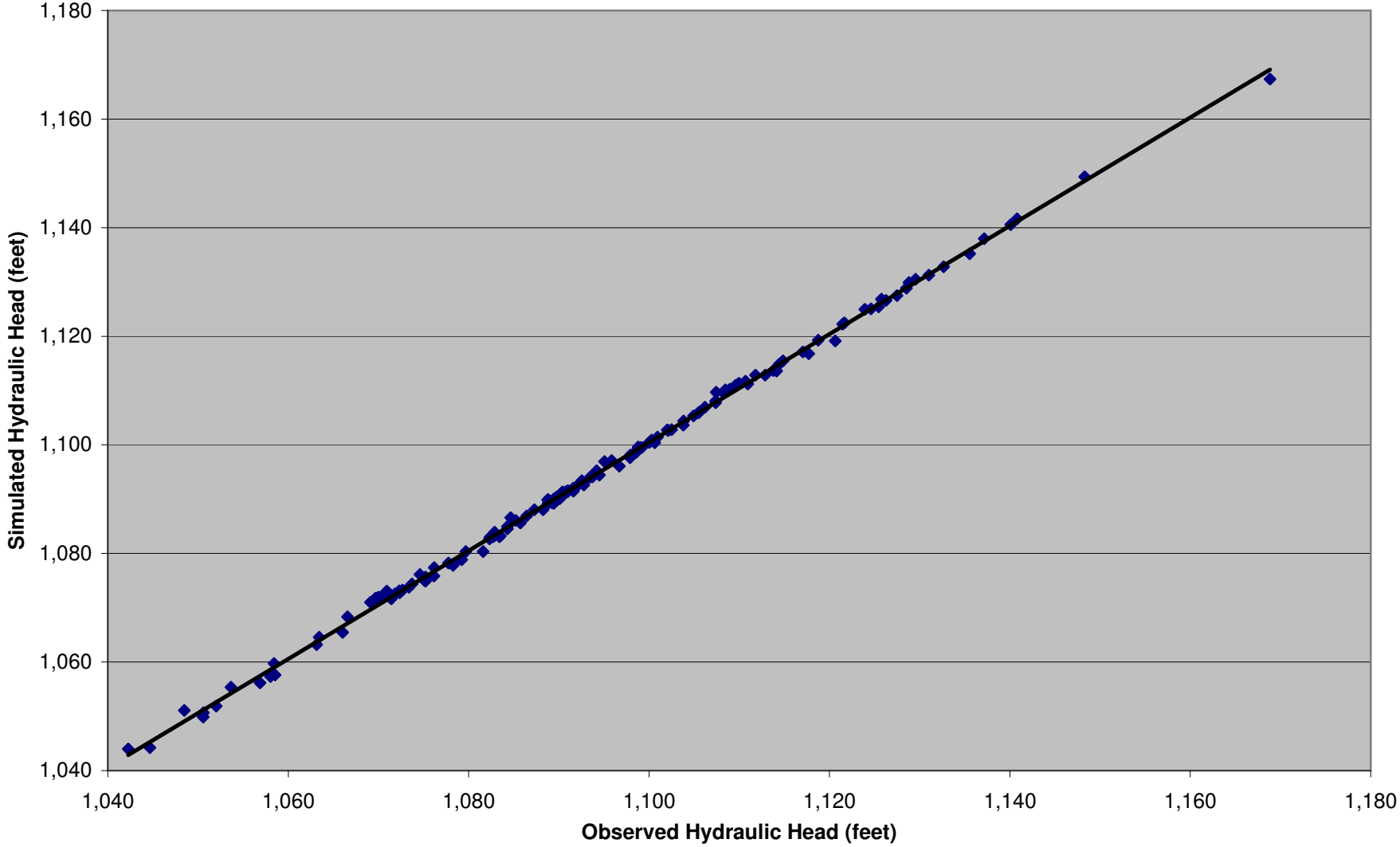


Fig 5.2-6 Comparison of Sim and OBS_10-30-2006.xls 5/30/2007

Figure 5.3-1
Long-Term Monthly Mean Potential Evapotranspiration Rate 1948 - 2006
Midwestern Regional Climate Center, Omaha Airport, Omaha, Nebraska

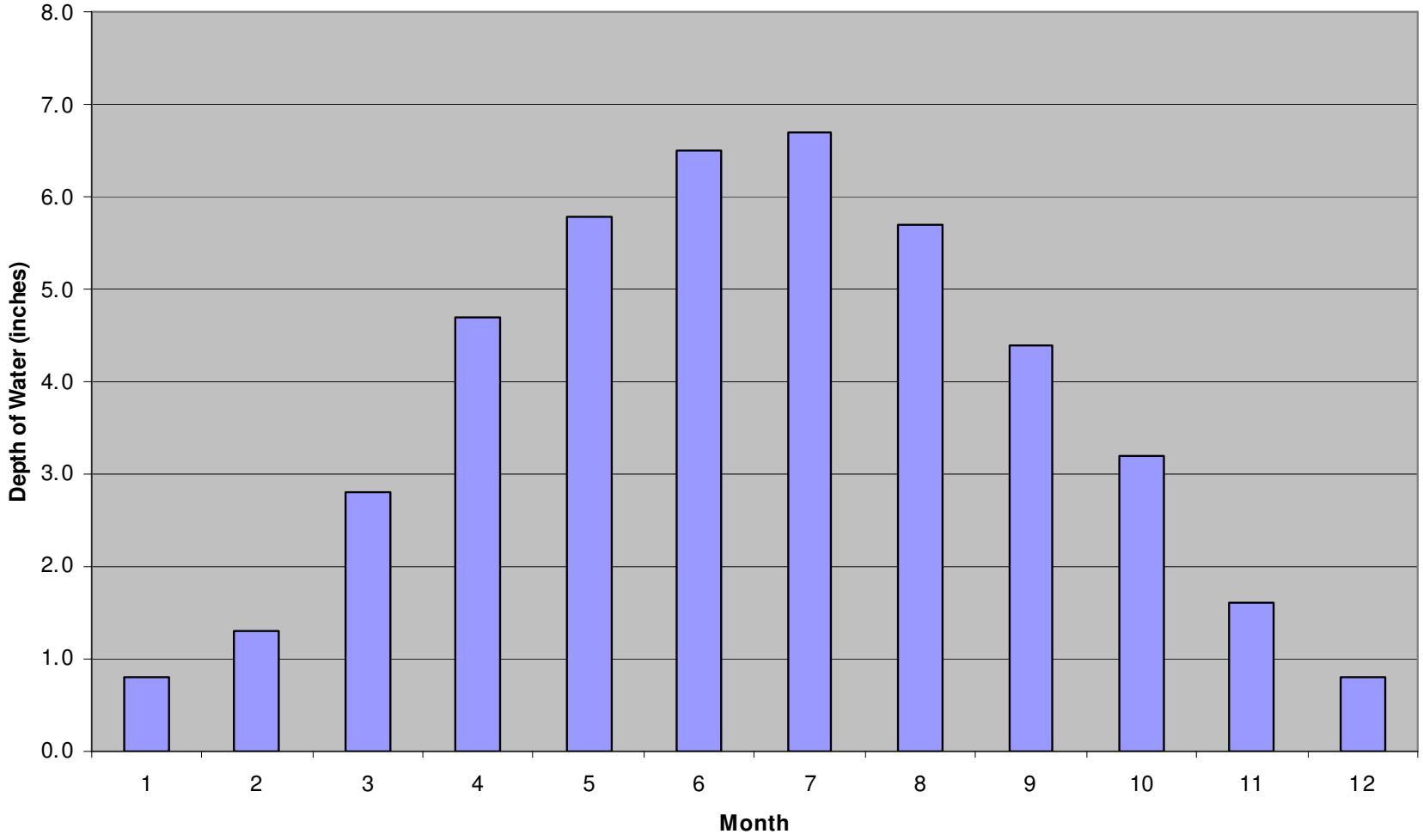


Figure 5.3-2
Observed Seasonal Pattern of Groundwater Levels in Platte Valley
Former Nebraska Ordnance Plant, Mead, Nebraska

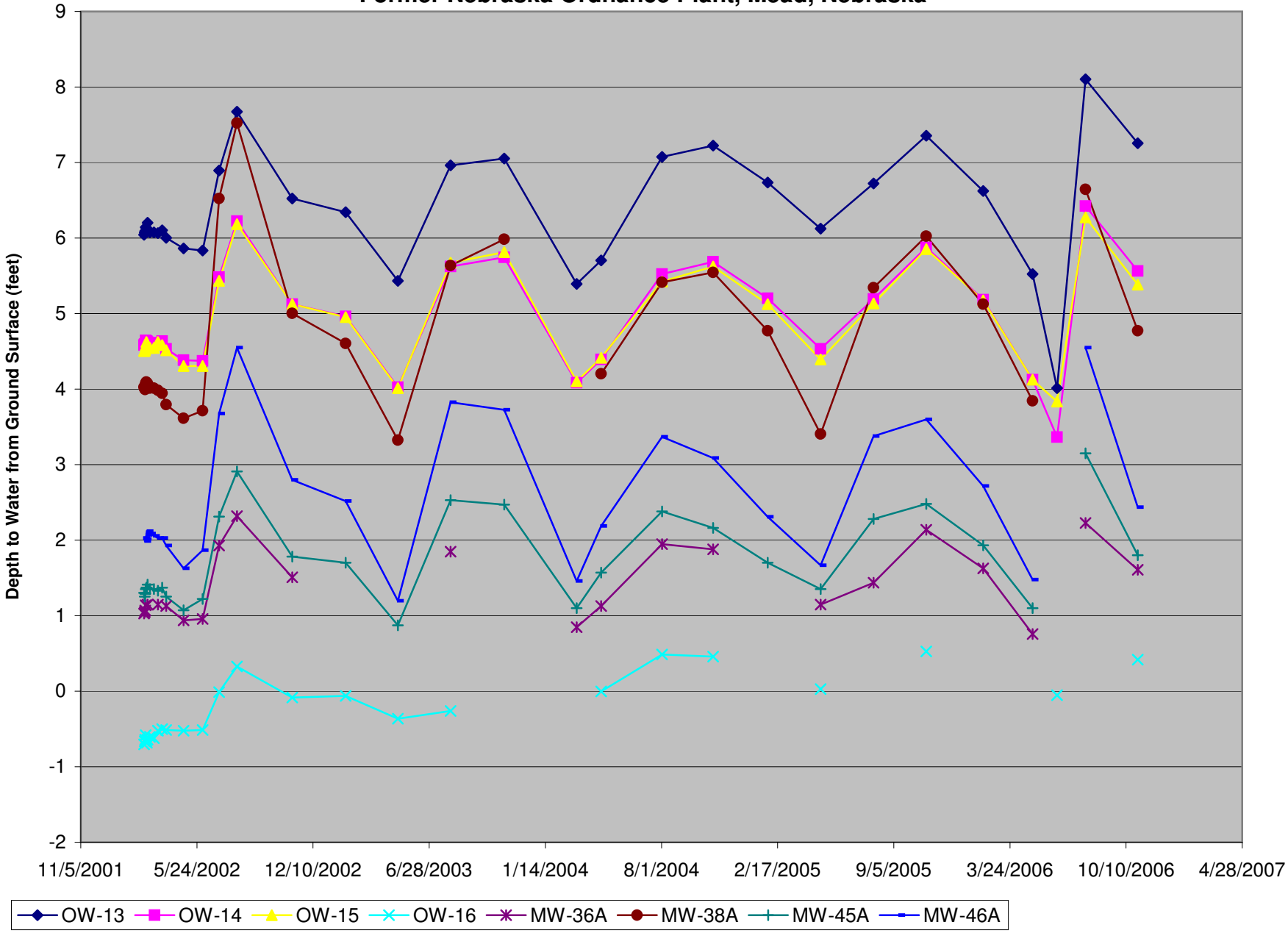


Fig 5.3-2 GW Seasonal Pattern Platte Valley.xls 5/30/2007

Figure 5.3-3
Observed Seasonal Pattern of Groundwater Levels in Wahoo Valley
Former Nebraska Ordnance Plant, Mead, Nebraska

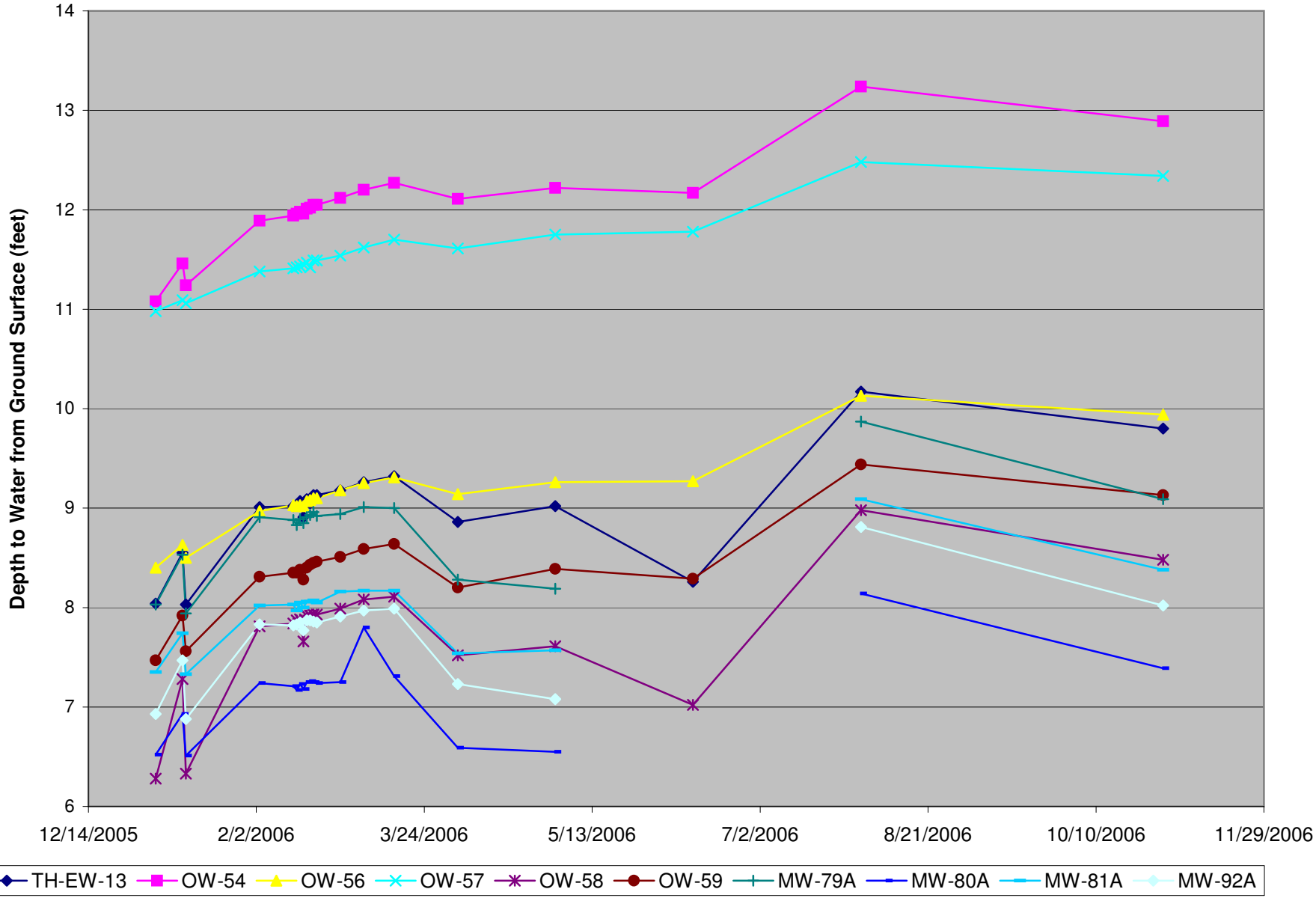
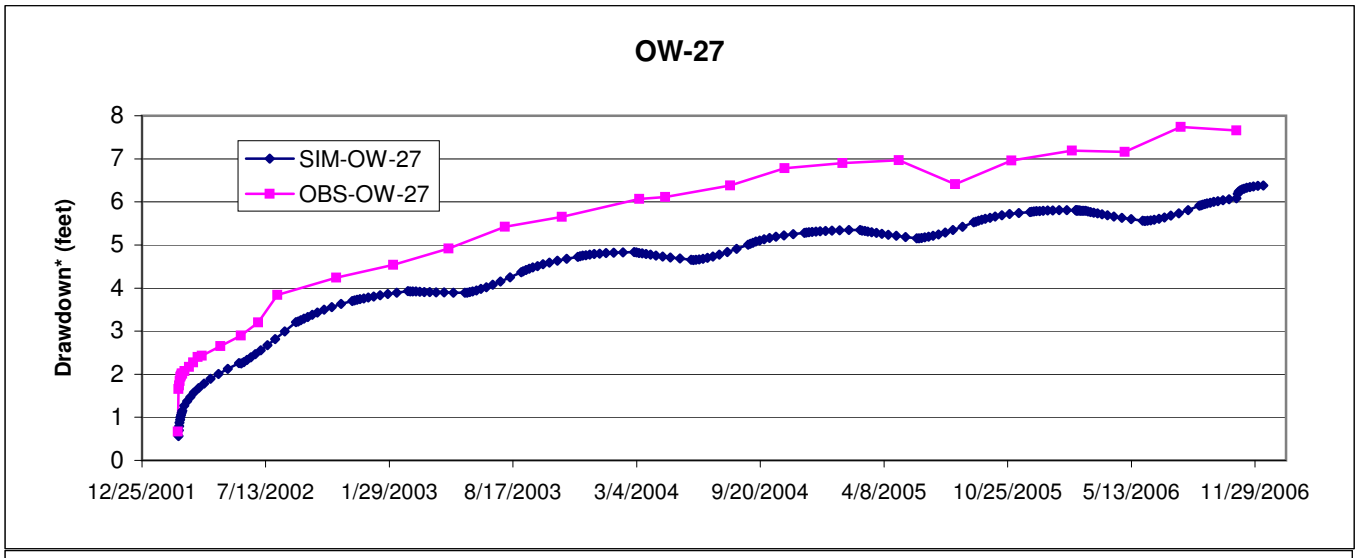
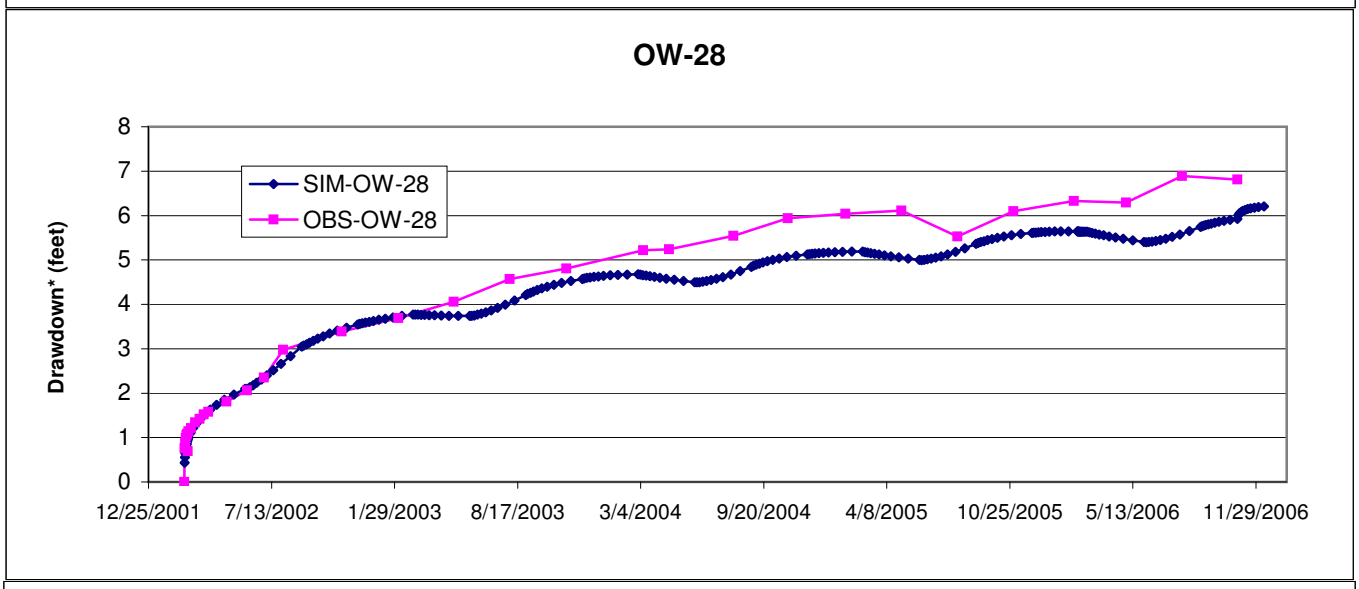
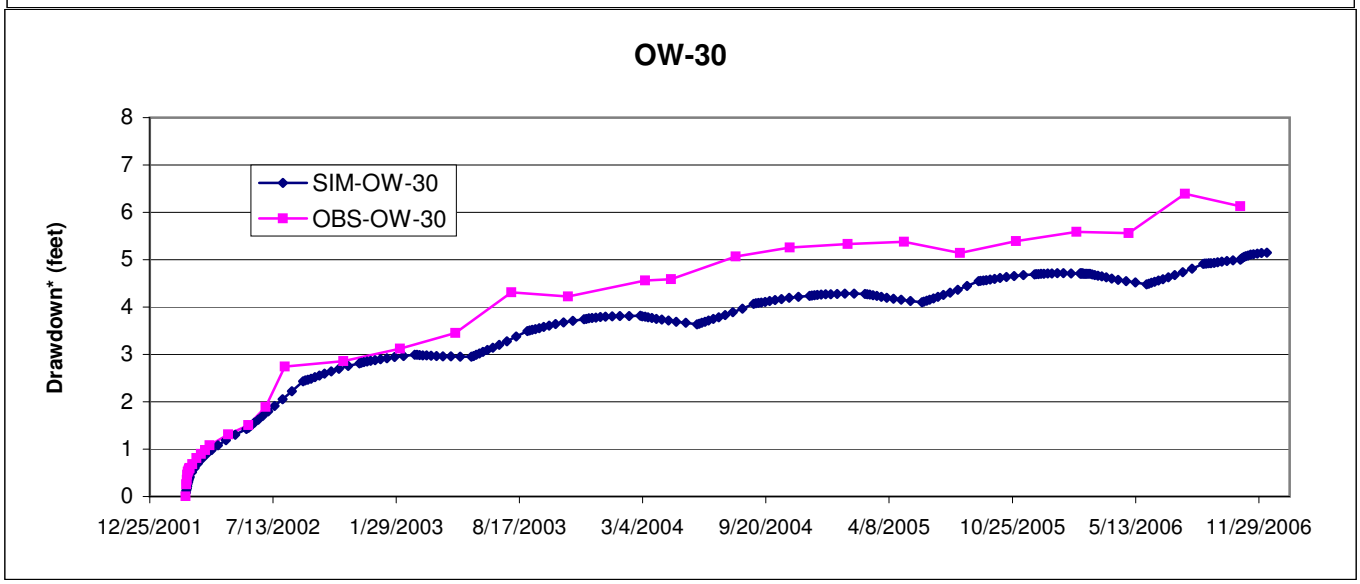


Fig 5.3-3 Seasonal PatternEW-12.xls 5/30/2007

Figure 5.3-4
Simulated and Observed Drawdowns near EW-3, 2002 - 2006

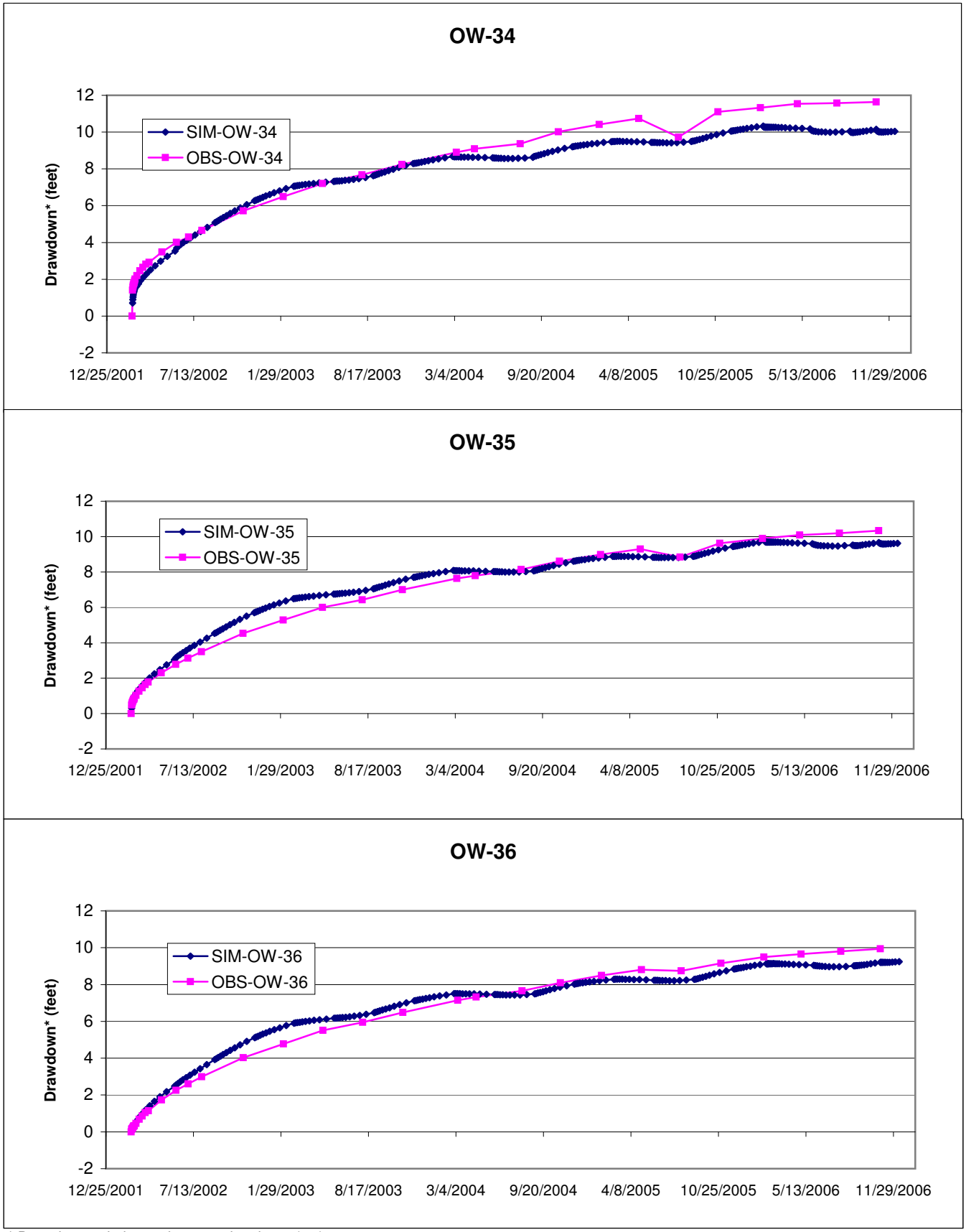






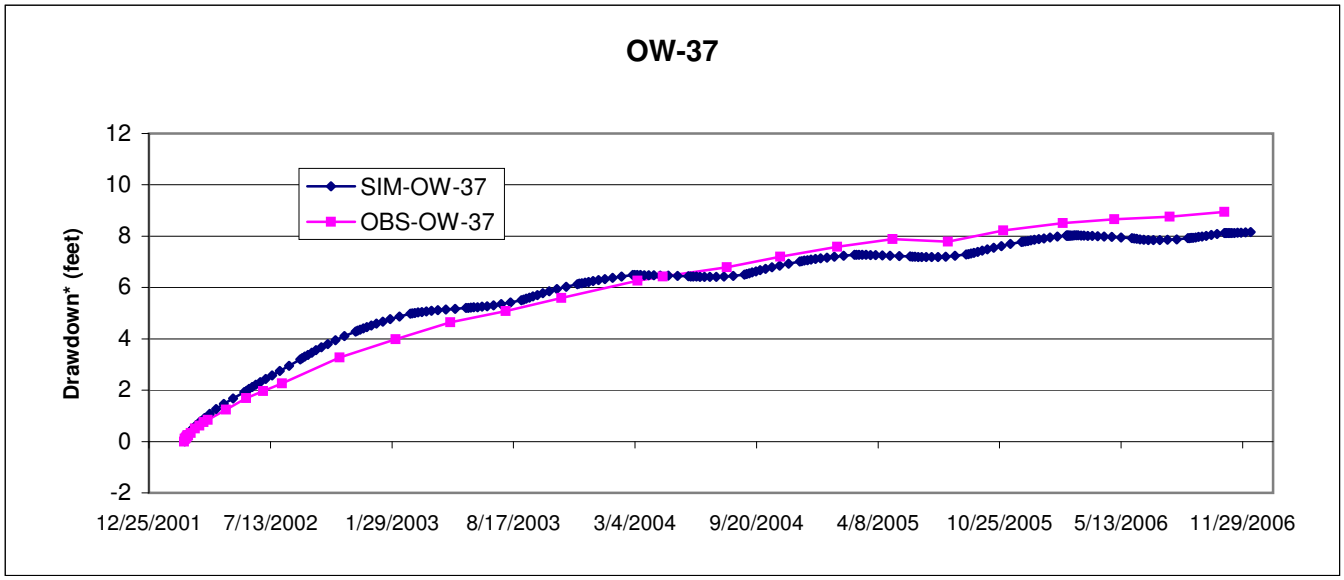
* Drawdown relative to the water level on 2/22/02.

Figure 5.3-5
Simulated and Observed Drawdowns near EW-5, 2002 - 2006



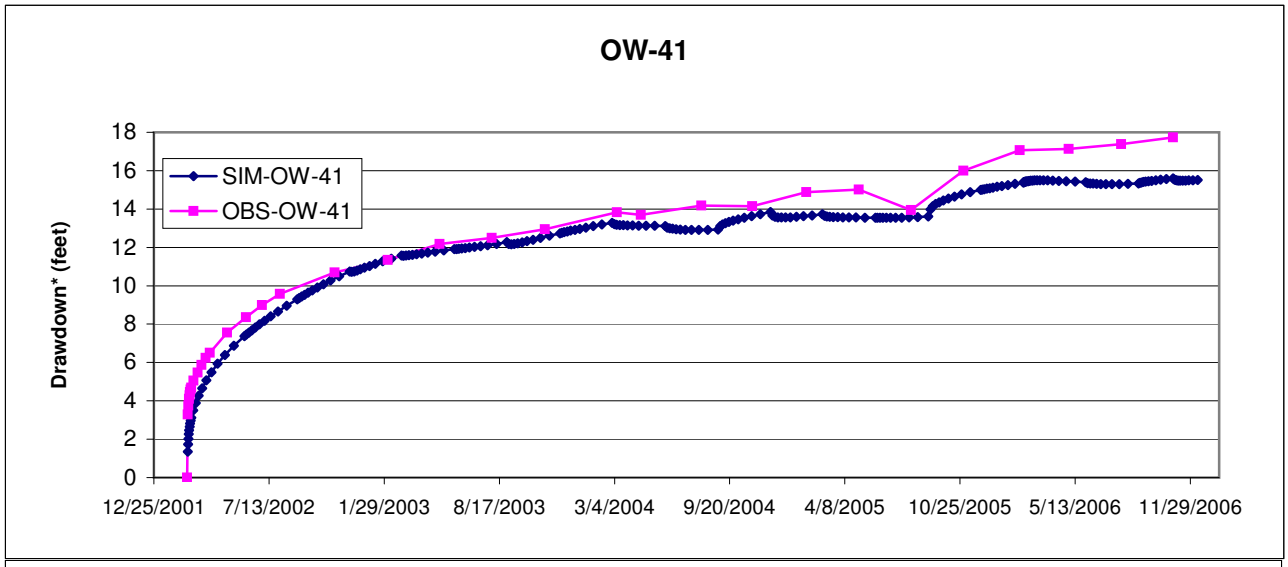
* Drawdown relative to the water level on 2/22/02.

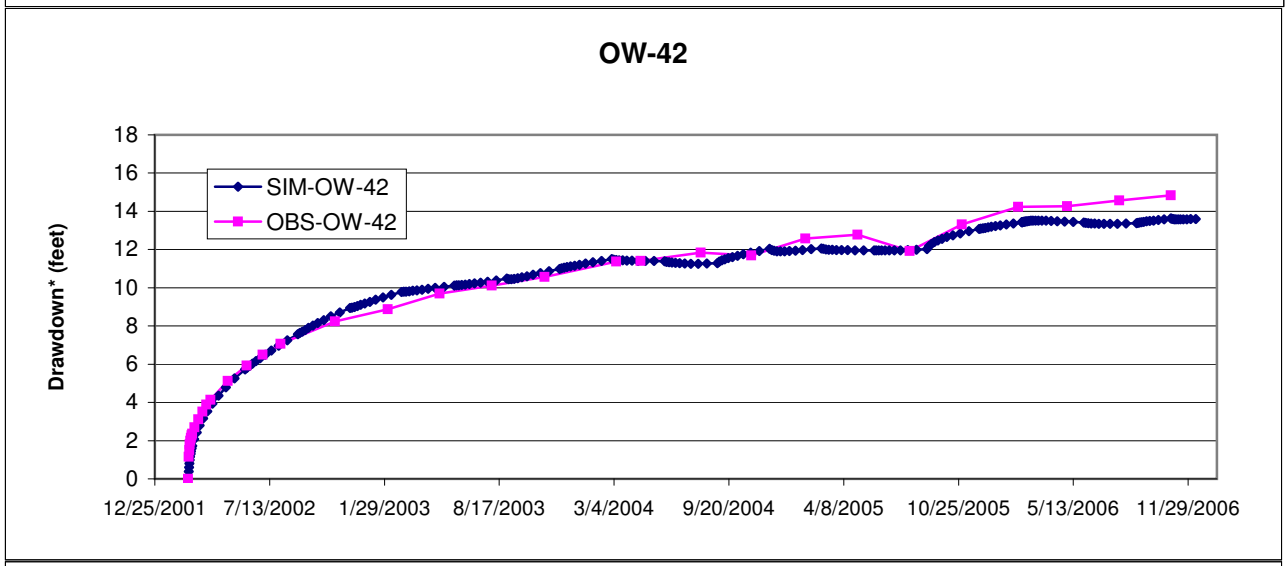
Figure 5.3-5
Simulated and Observed Drawdowns near EW-5, 2002 - 2006

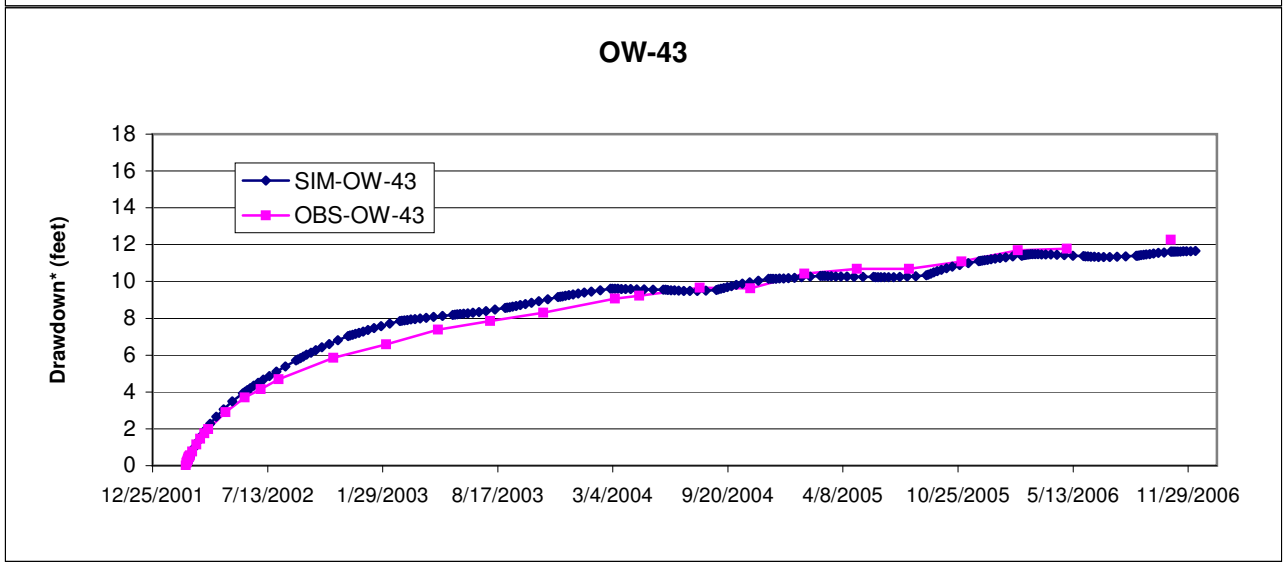


* Drawdown relative to the water level on 2/22/02.

Figure 5.3-6
Simulated and Observed Drawdowns near EW-7, 2002 - 2006

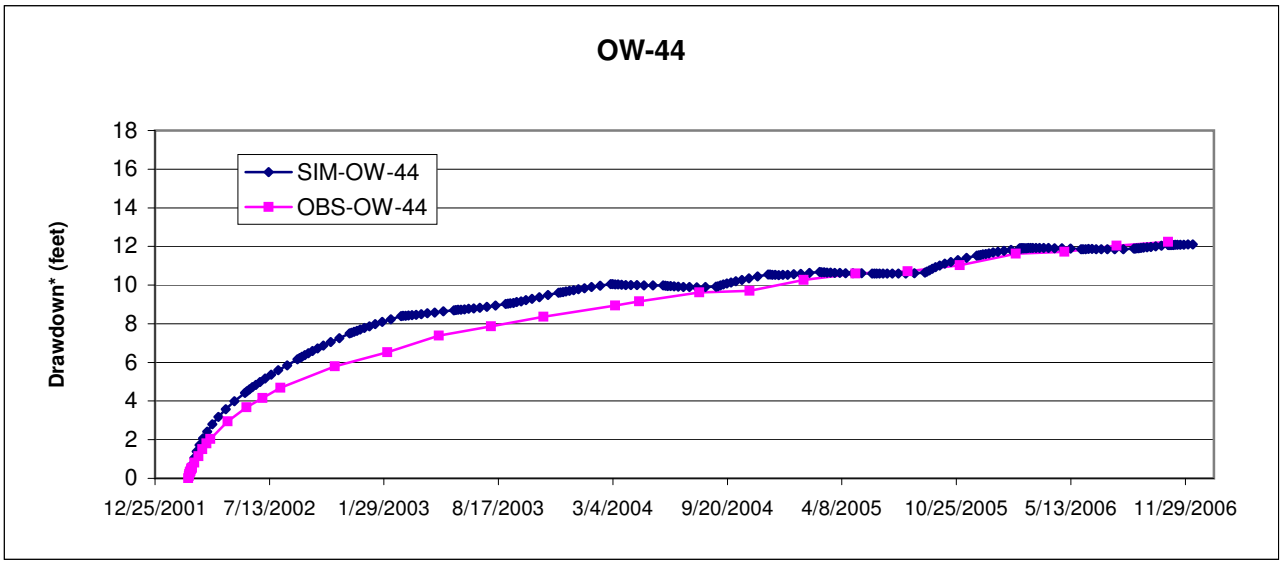






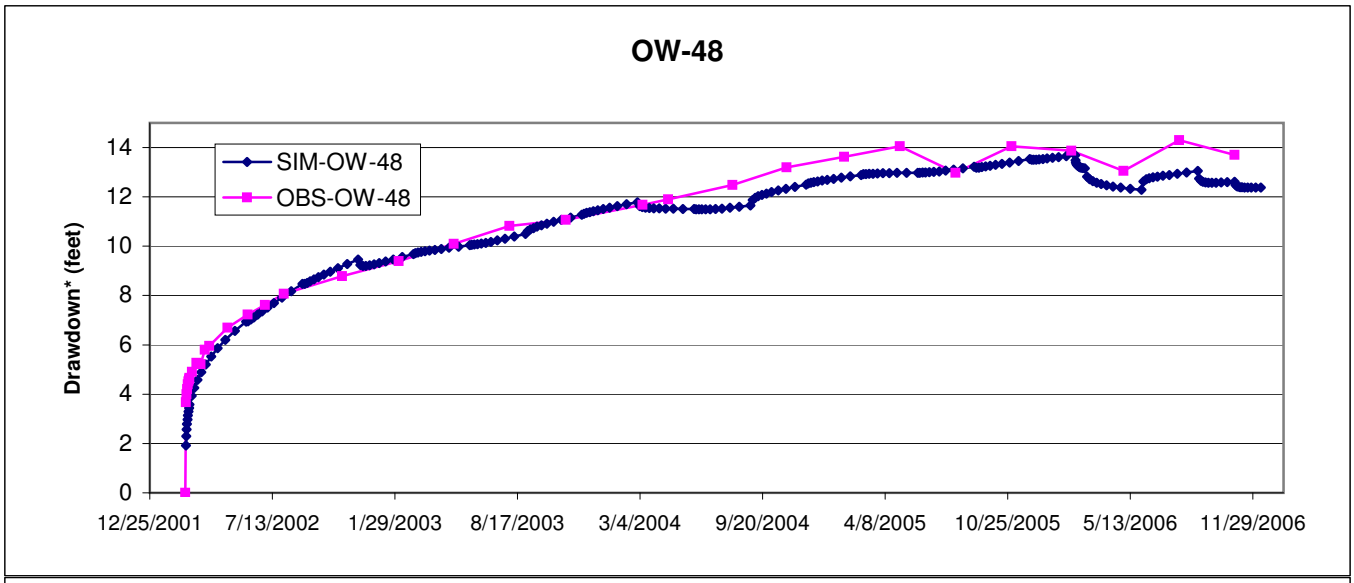
* Drawdown relative to the water level on 2/22/02.

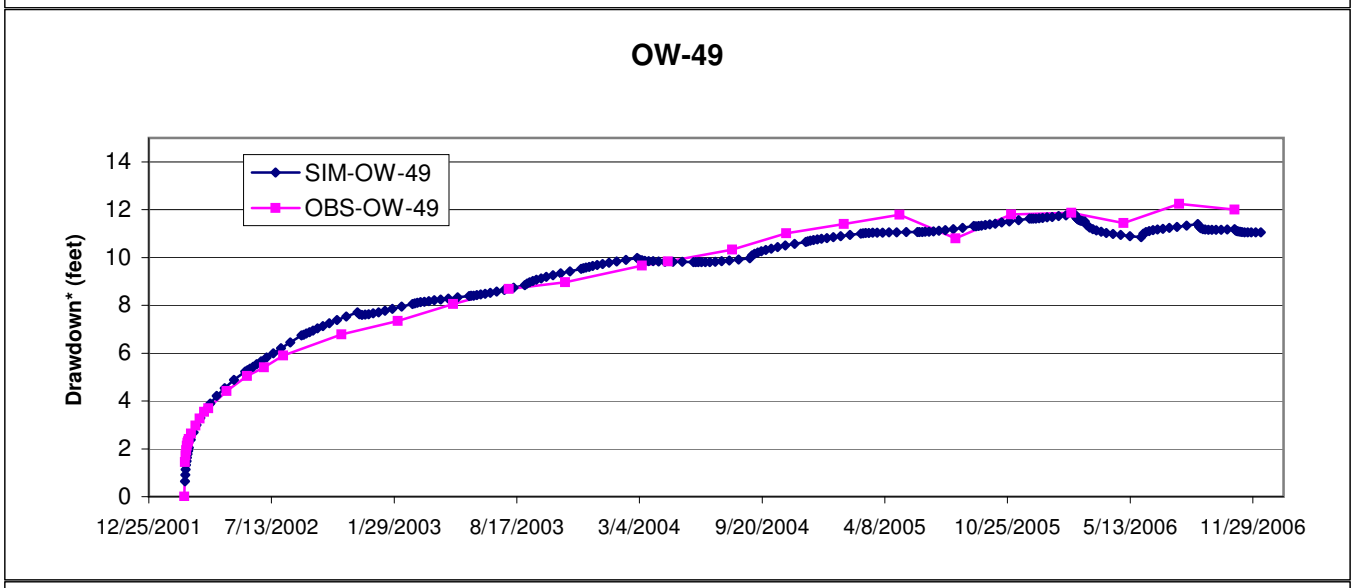
Figure 5.3-6
Simulated and Observed Drawdowns near EW-7, 2002 - 2006

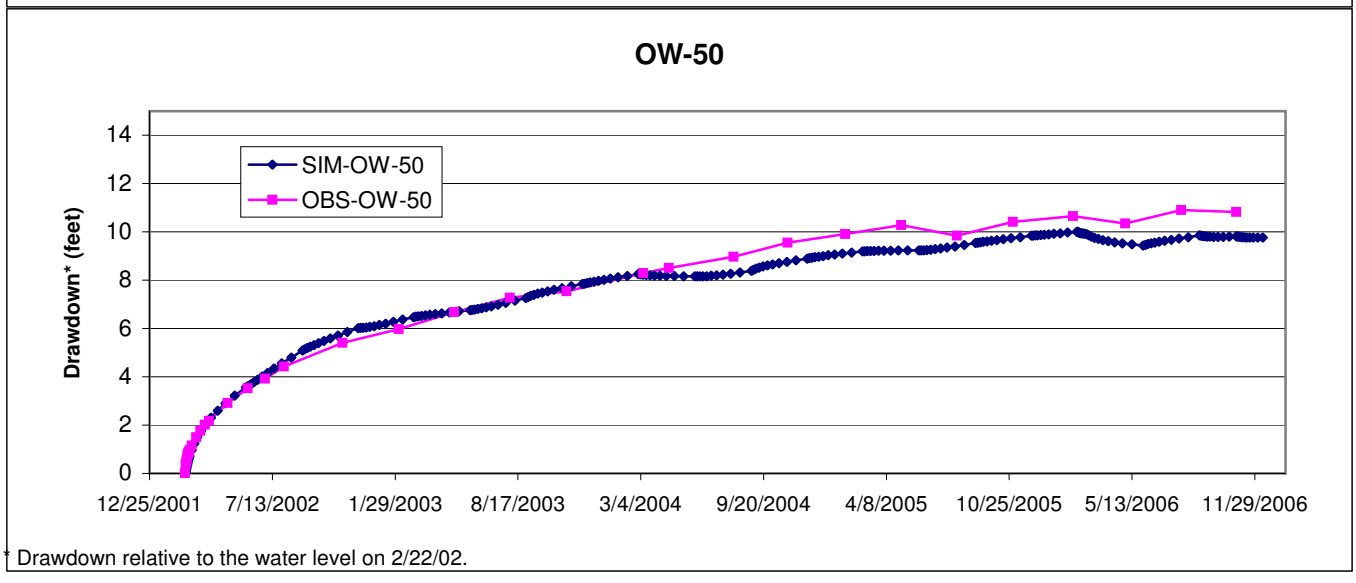


* Drawdown relative to the water level on 2/22/02.

Figure 5.3-7
Simulated and Observed Drawdowns near EW-10, 2002 - 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

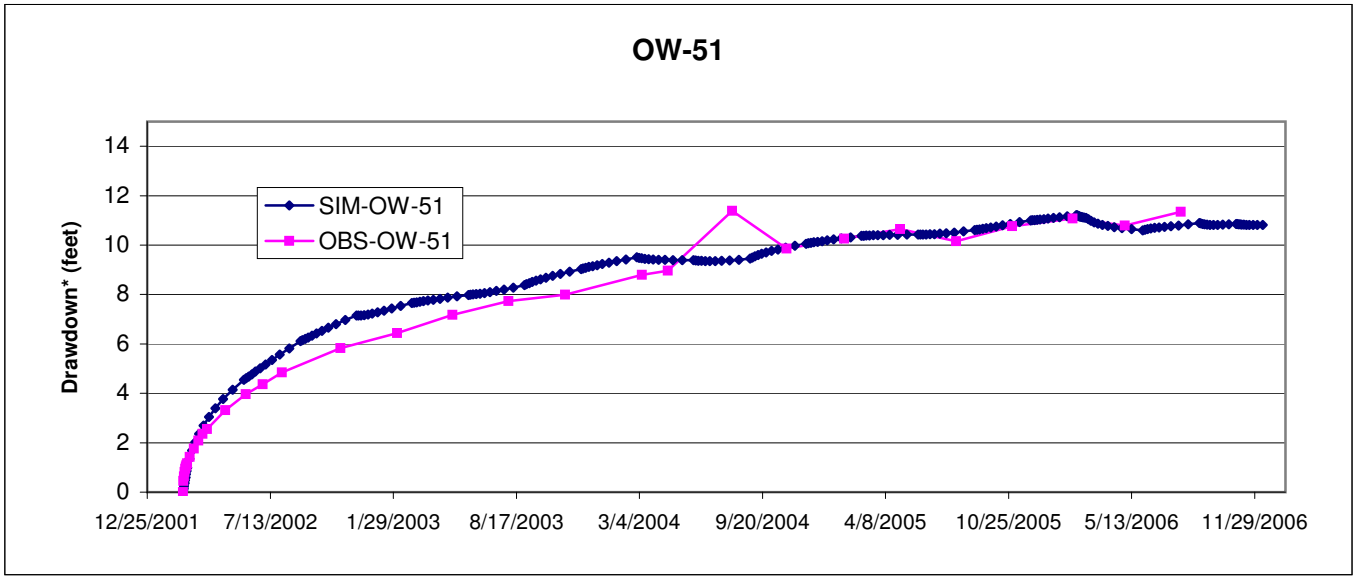






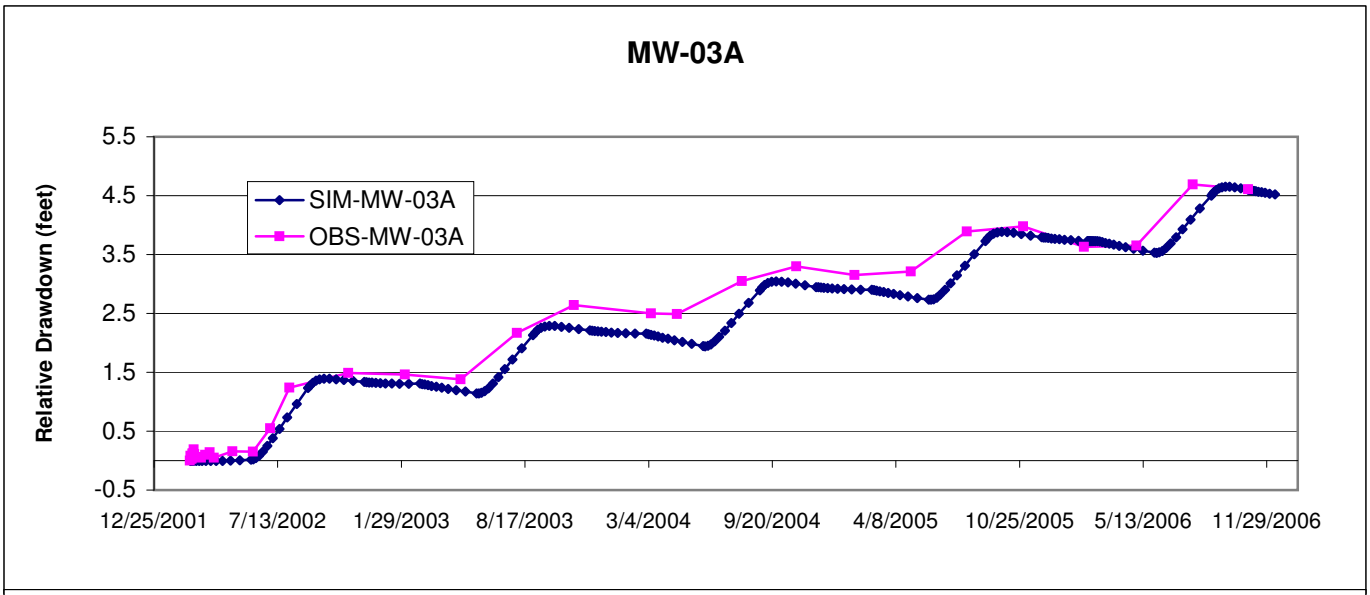
* Drawdown relative to the water level on 2/22/02.

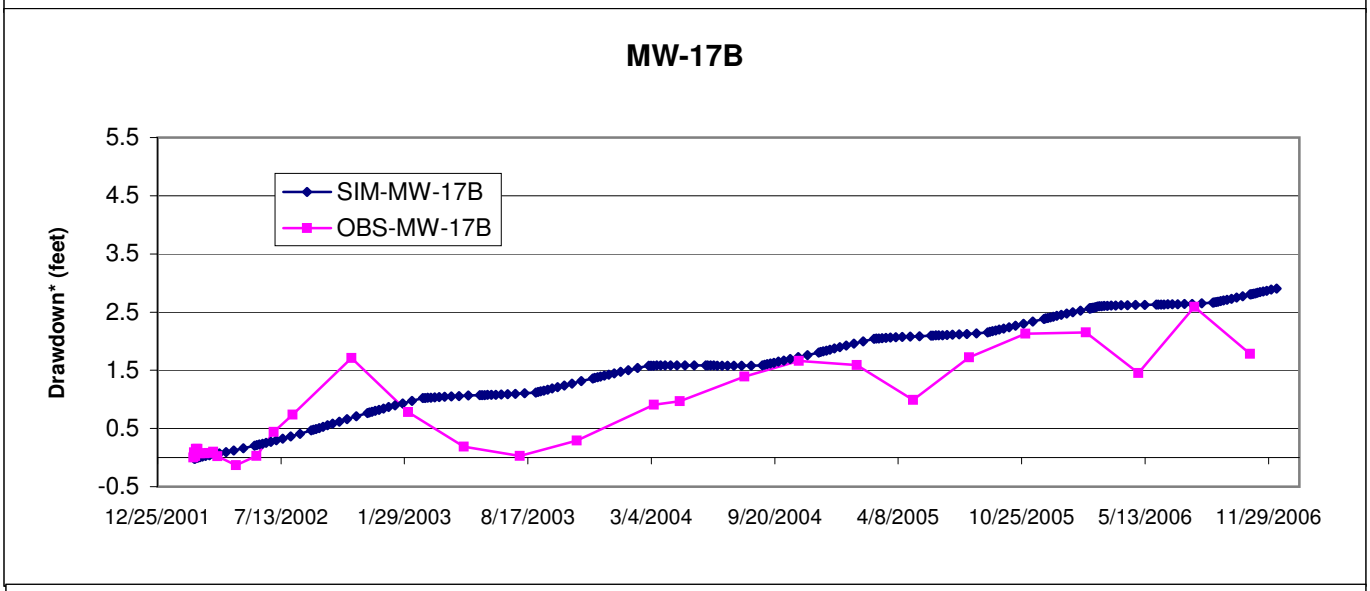
Figure 5.3-7
Simulated and Observed Drawdowns near EW-10, 2002 - 2006
Former Nebraska Ordnance Plant, Mead, Nebraska

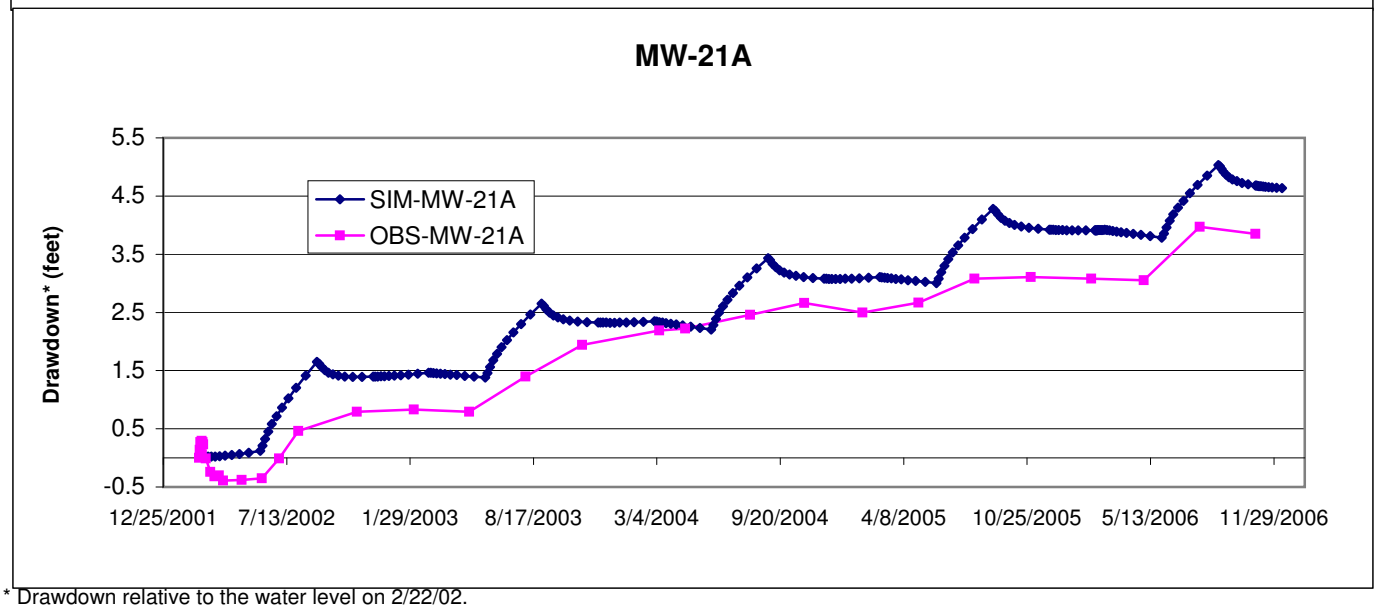


* Drawdown relative to the water level on 2/22/02.

Figure 5.3-8
Simulated and Observed Drawdowns in LL1 Plume Area, 2002 - 2006

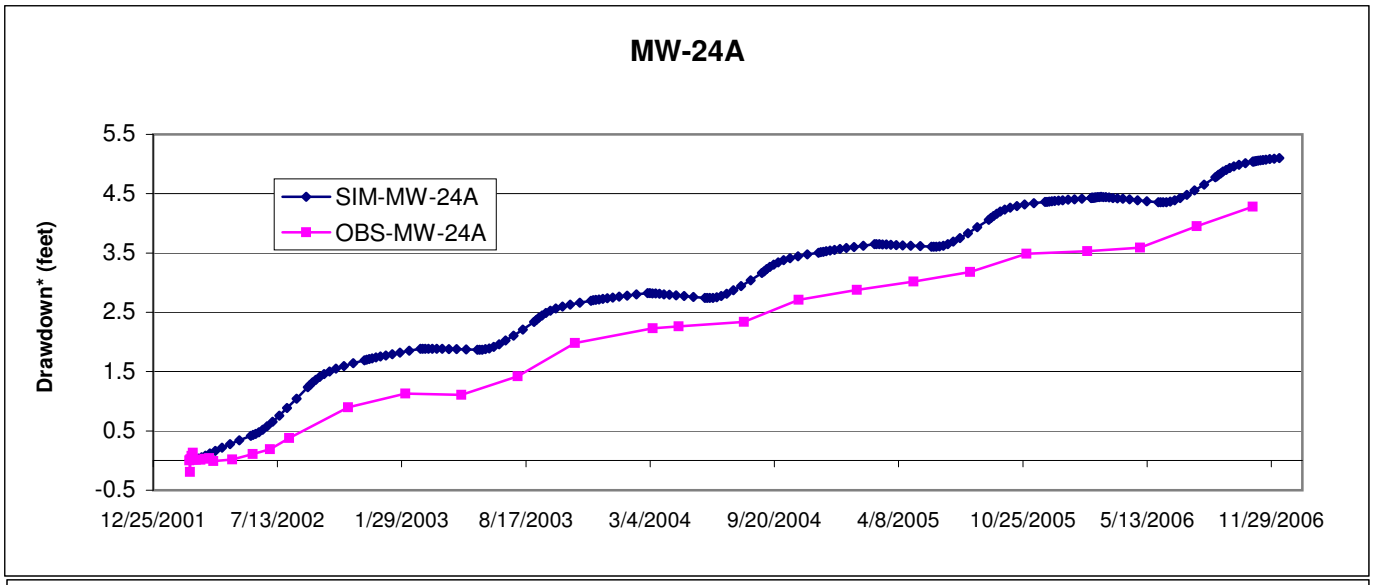


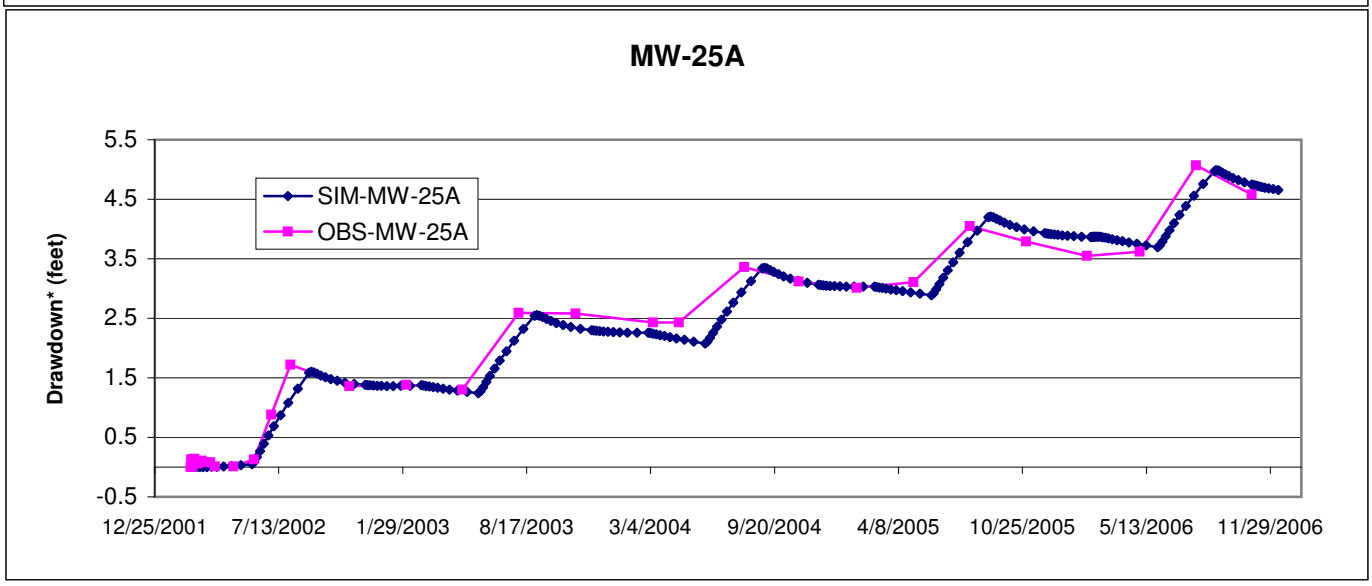




* Drawdown relative to the water level on 2/22/02.

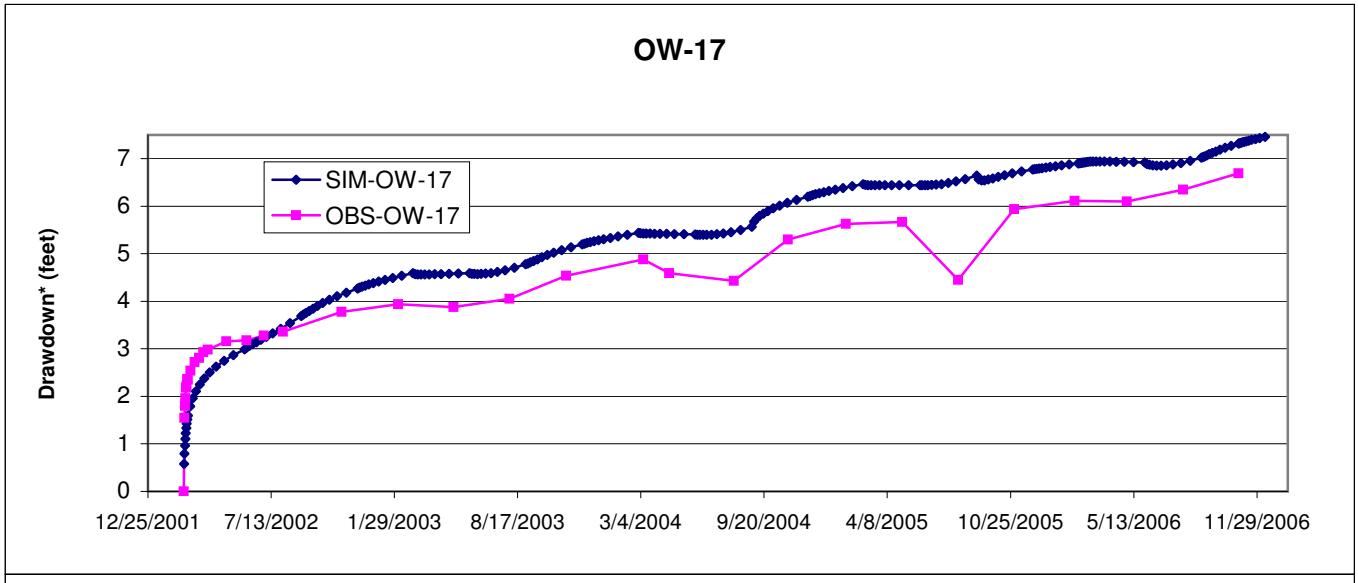
Figure 5.3-8
Simulated and Observed Drawdowns in LL1 Plume Area, 2002 - 2006

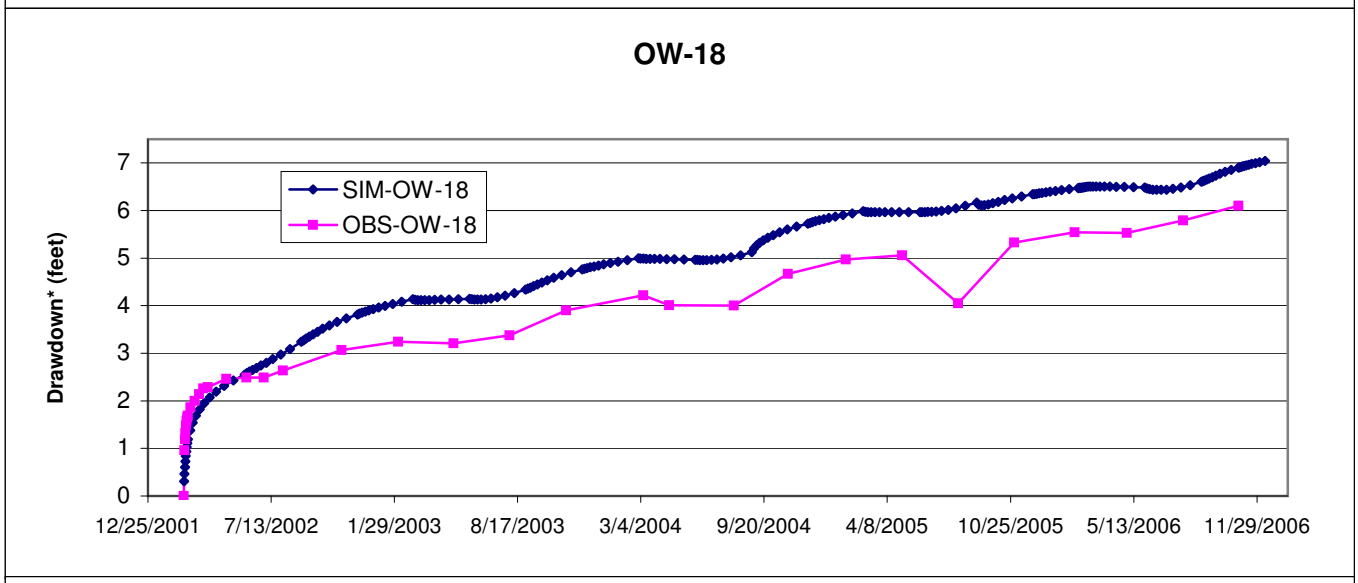


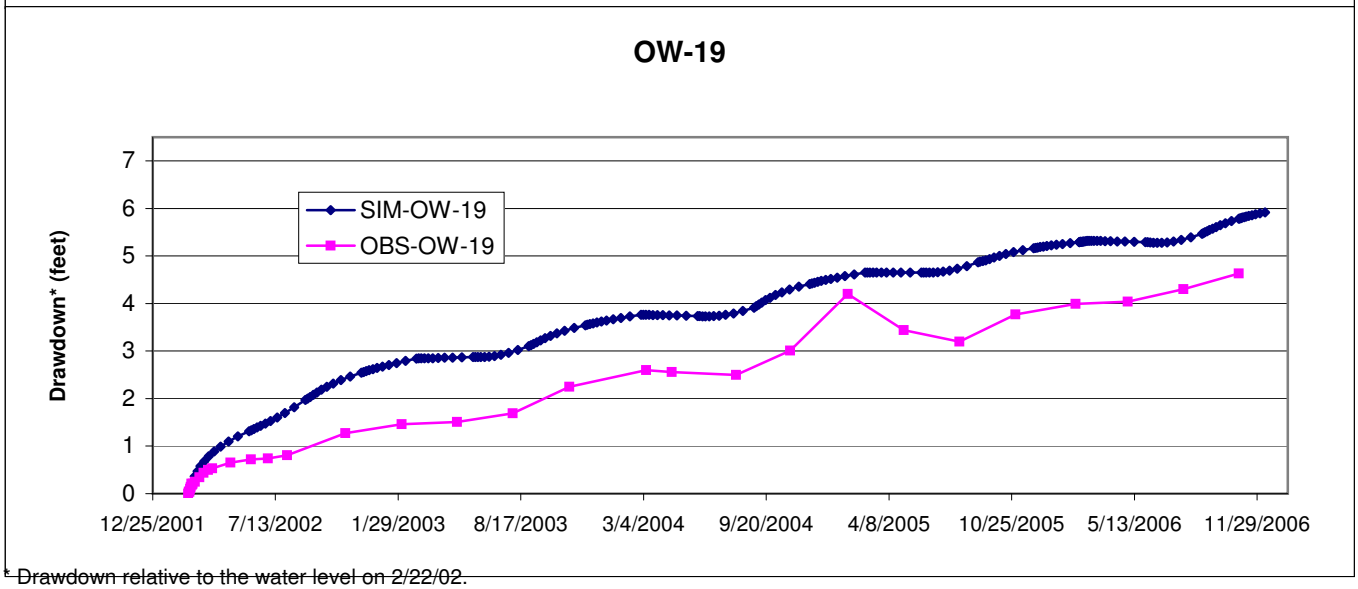


* Drawdown relative to the water level on 2/22/02.

Figure 5.3-9
Simulated and Observed Drawdowns near EW-8, 2002 - 2006

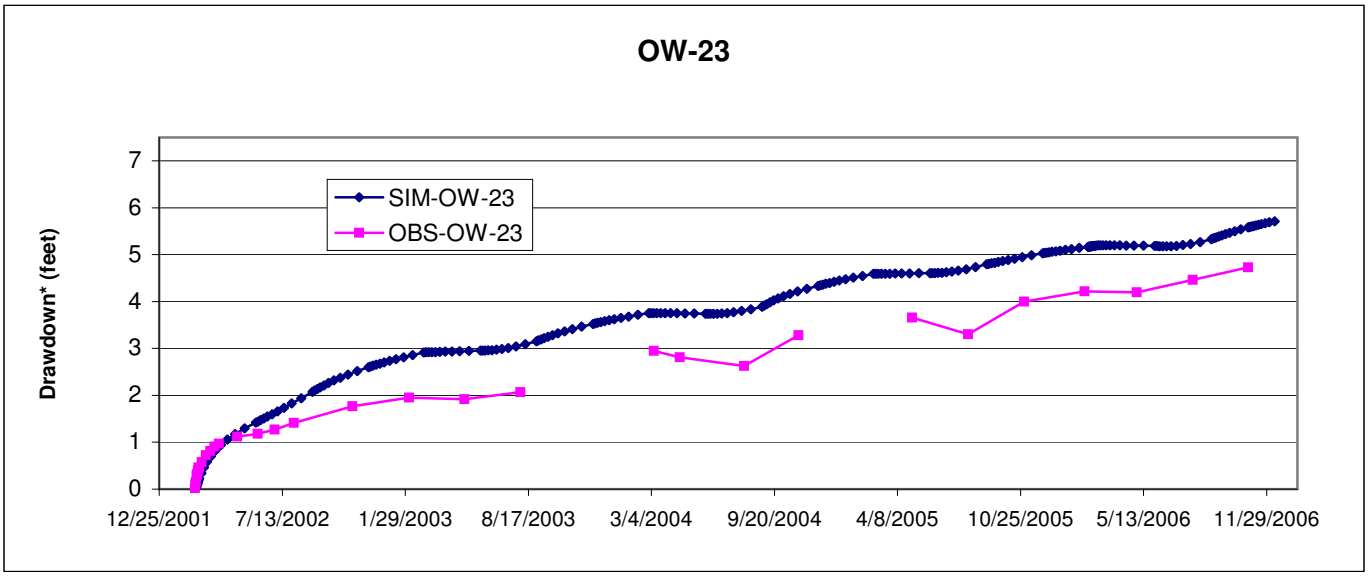






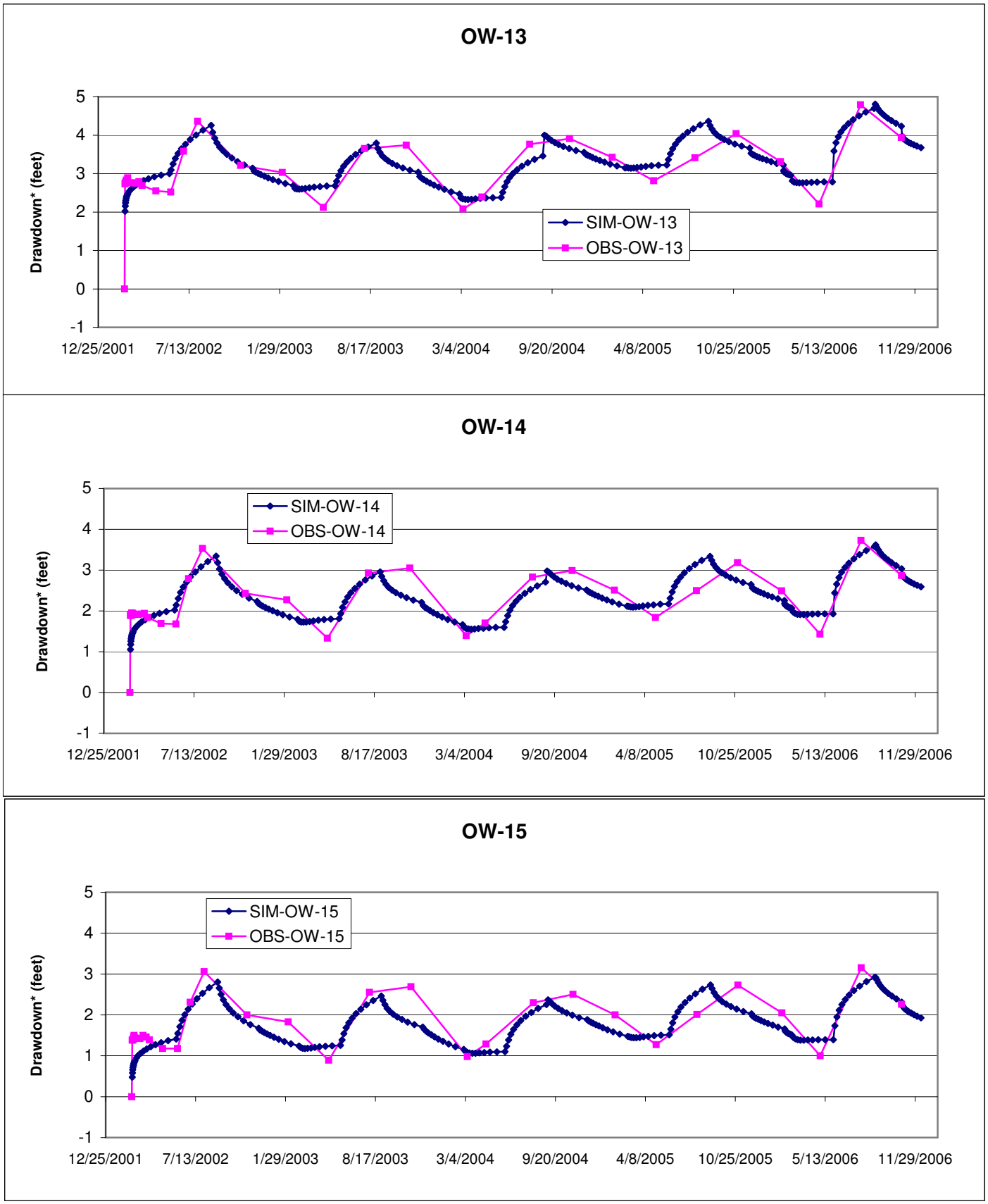
* Drawdown relative to the water level on 2/22/02.

Figure 5.3-9
Simulated and Observed Drawdowns near EW-8, 2002 - 2006



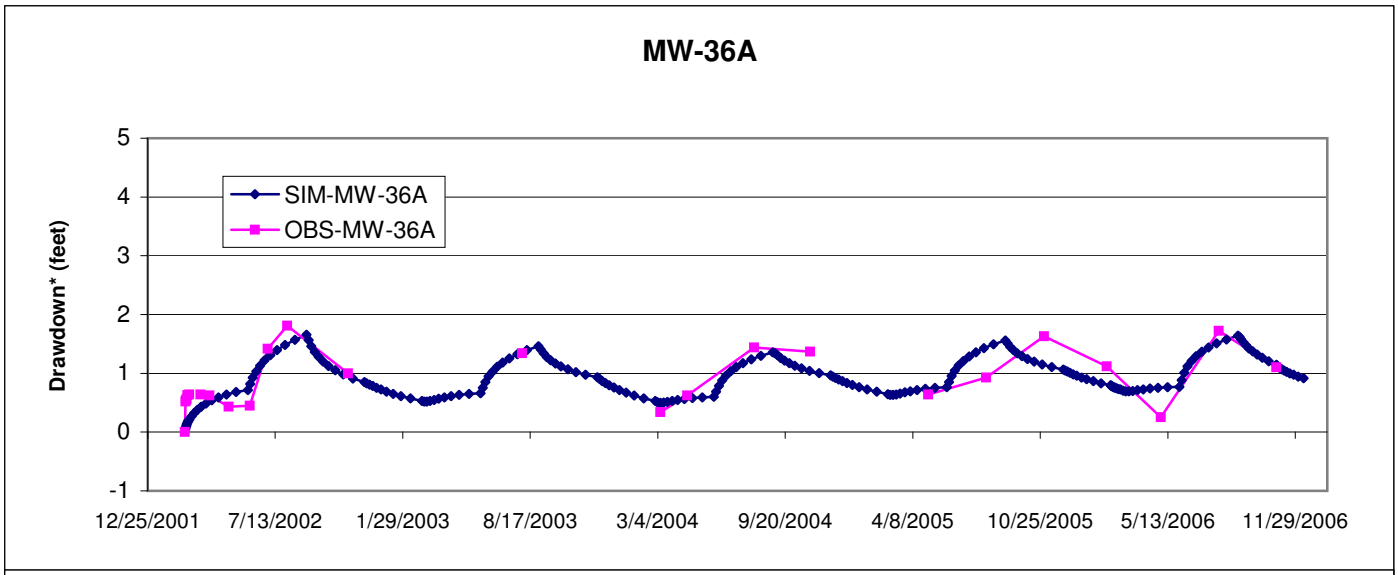
* Drawdown relative to the water level on 2/22/02.

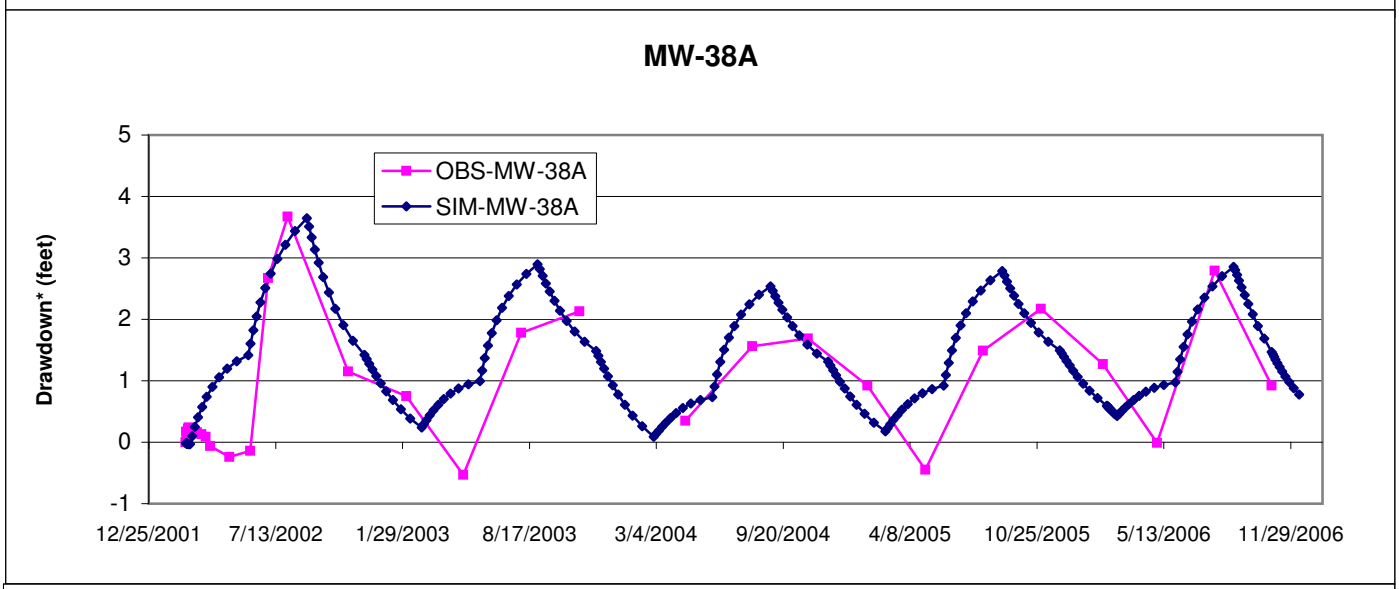
Figure 5.3-10
Simulated and Observed Drawdowns near EW-1, 2002 - 2006

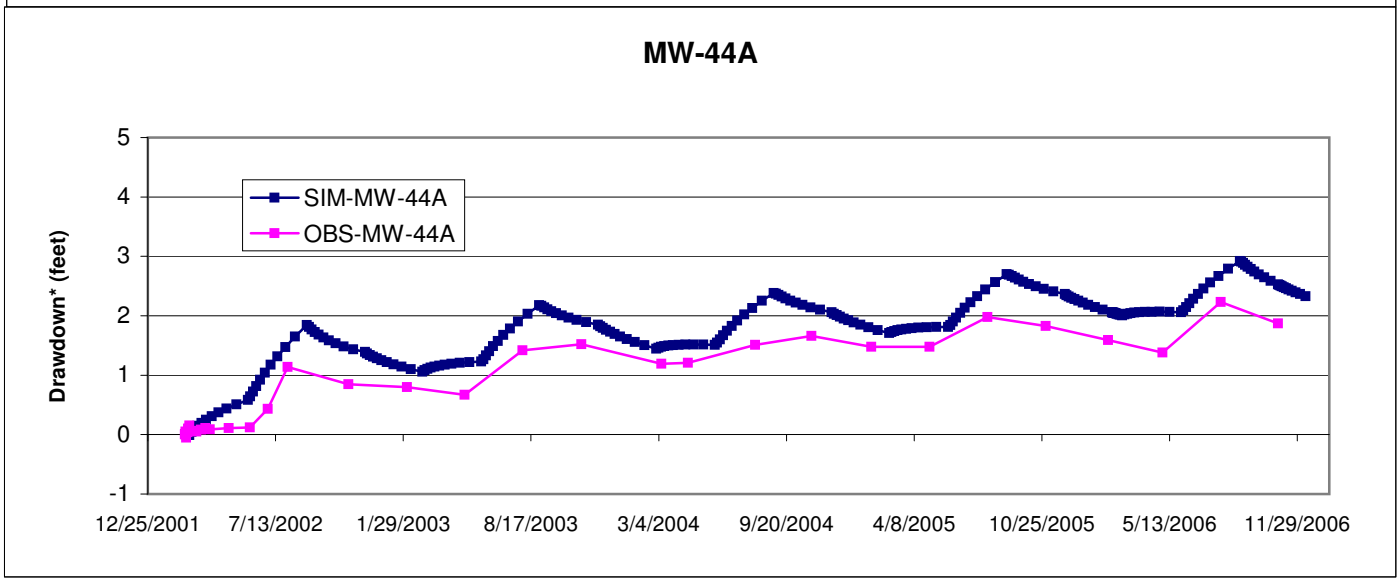


* Drawdown relative to the water level on 2/22/02.

Figure 5.3-10
Simulated and Observed Drawdowns near EW-1, 2002 - 2006

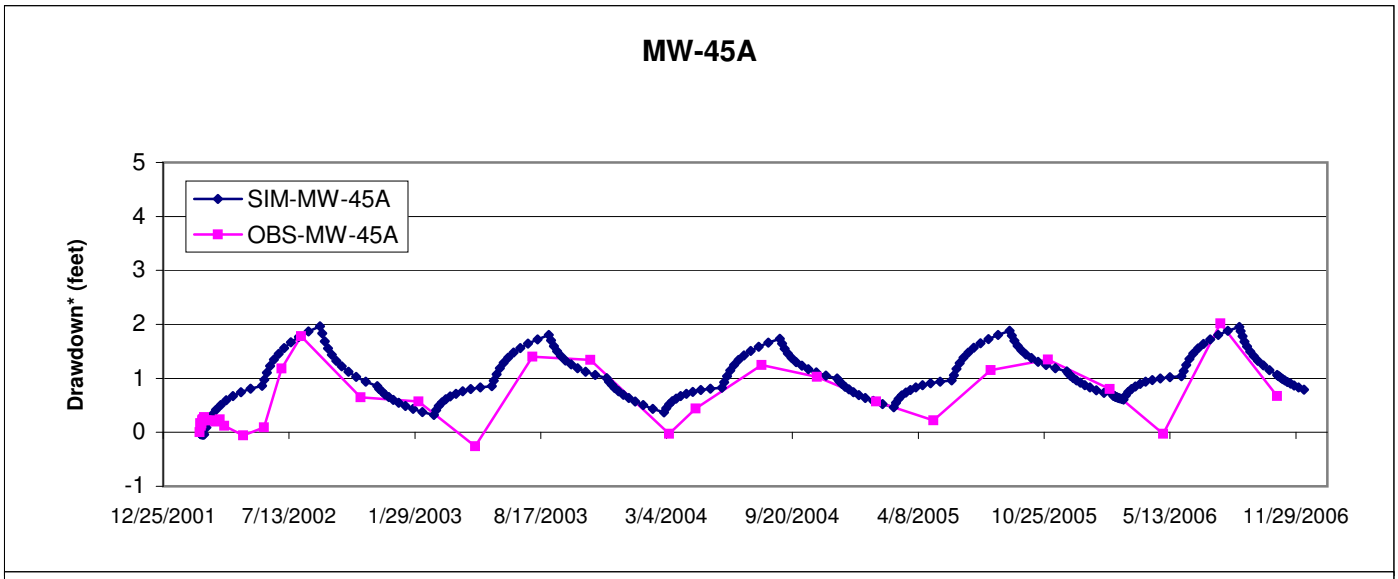


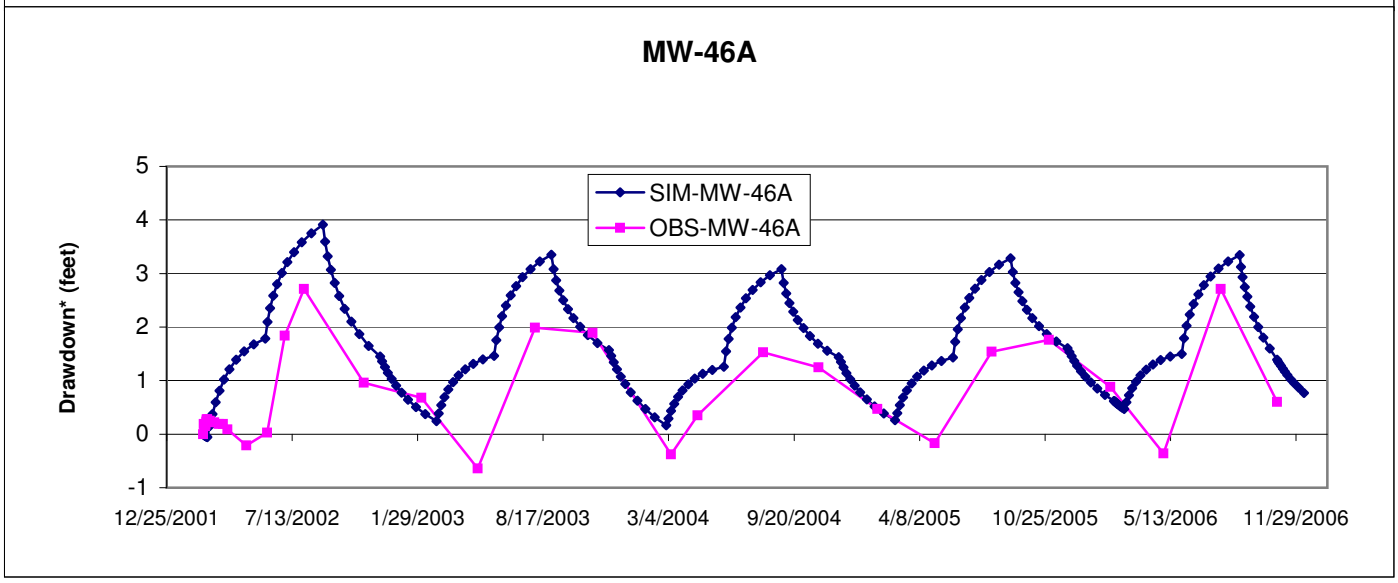




* Drawdown relative to the water level on 2/22/02.

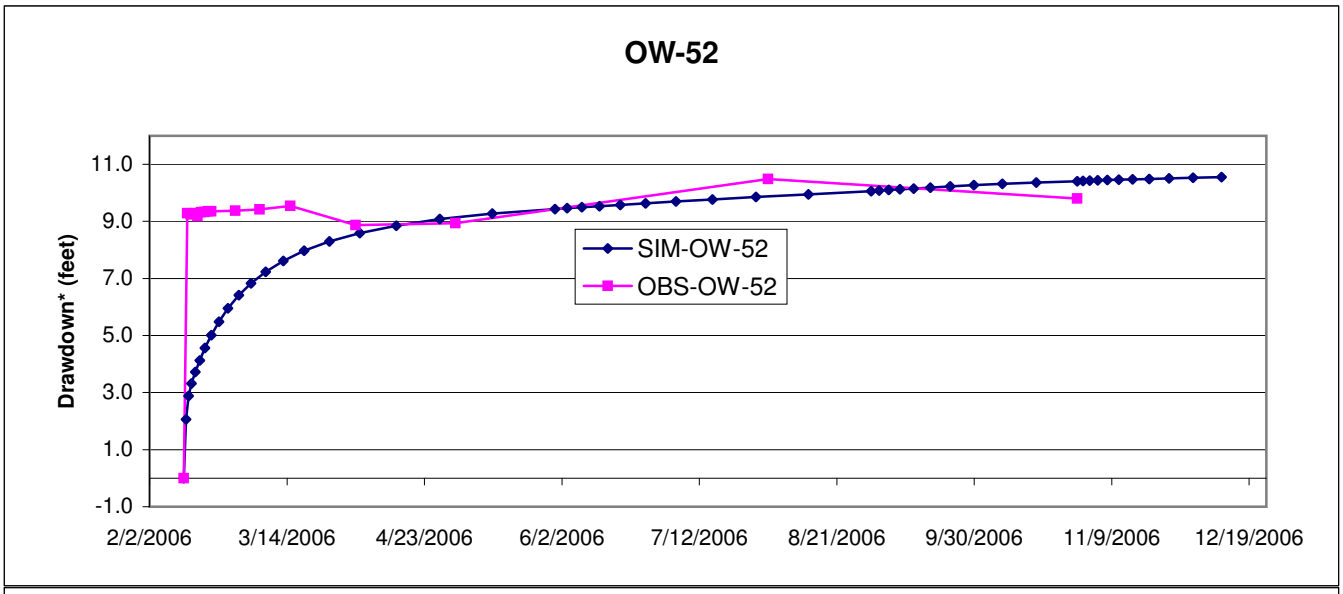
Figure 5.3-10
Simulated and Observed Drawdowns near EW-1, 2002 - 2006

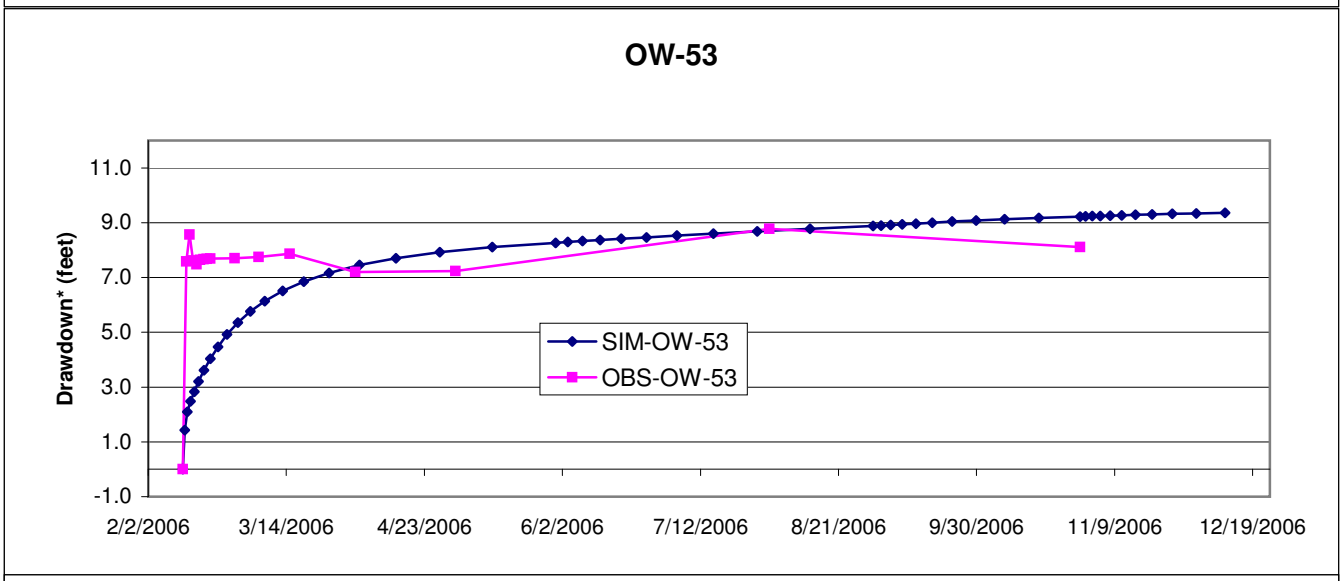


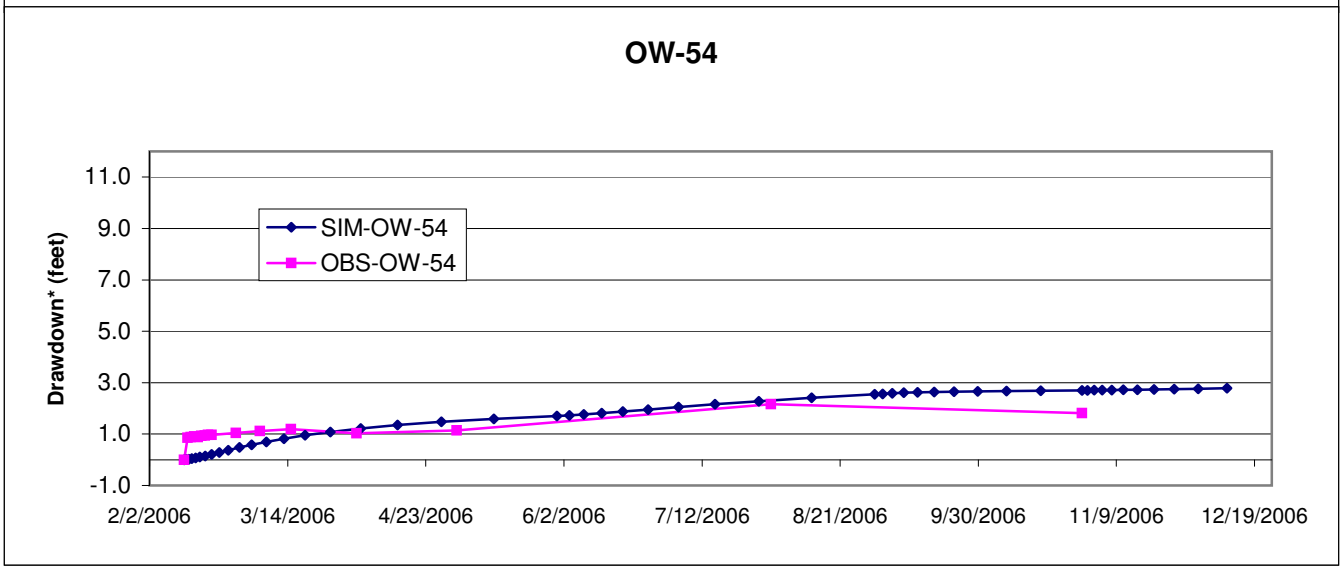


* Drawdown relative to the water level on 2/22/02.

Figure 5.3-11
Simulated and Observed Drawdowns near EW-12, 2002 - 2006

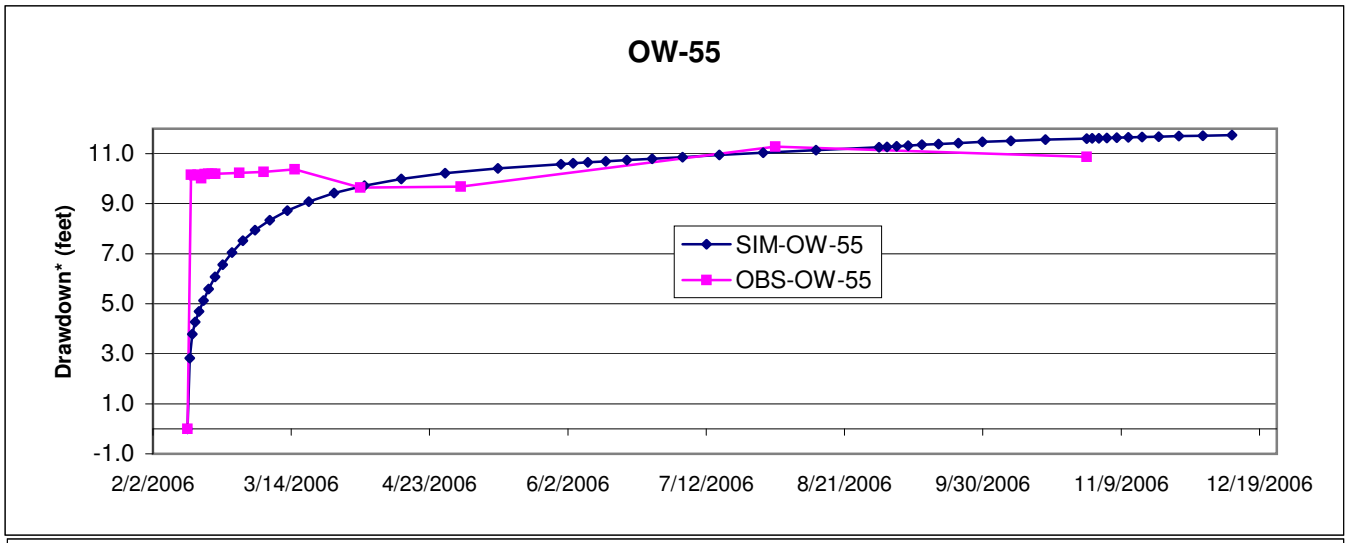


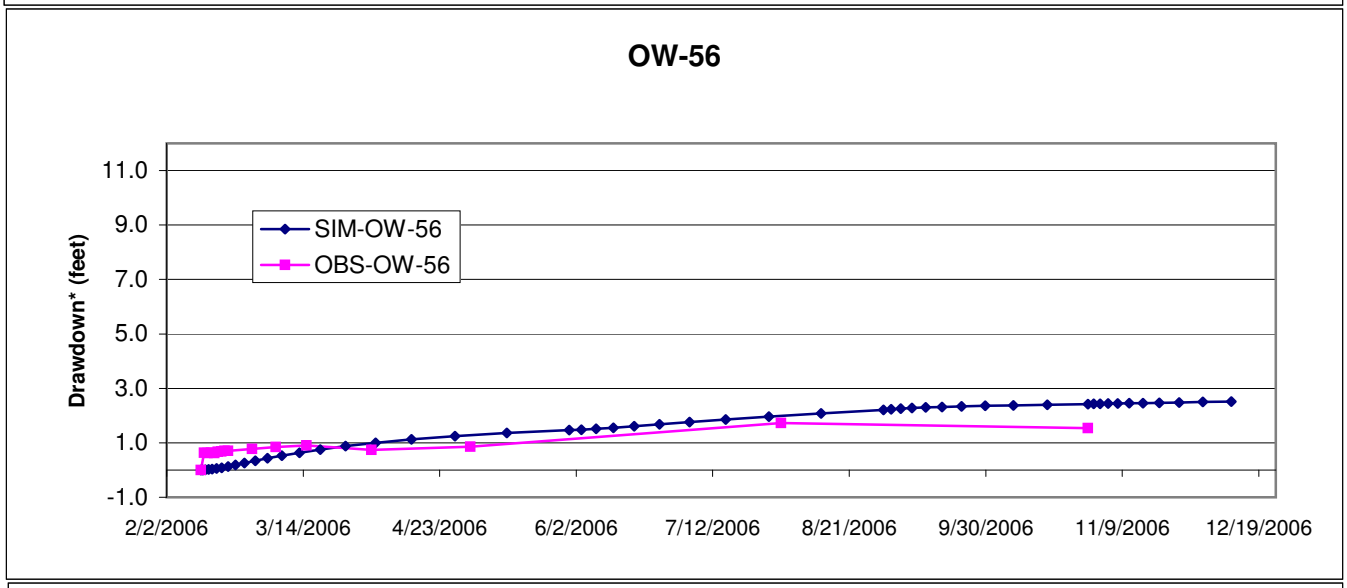


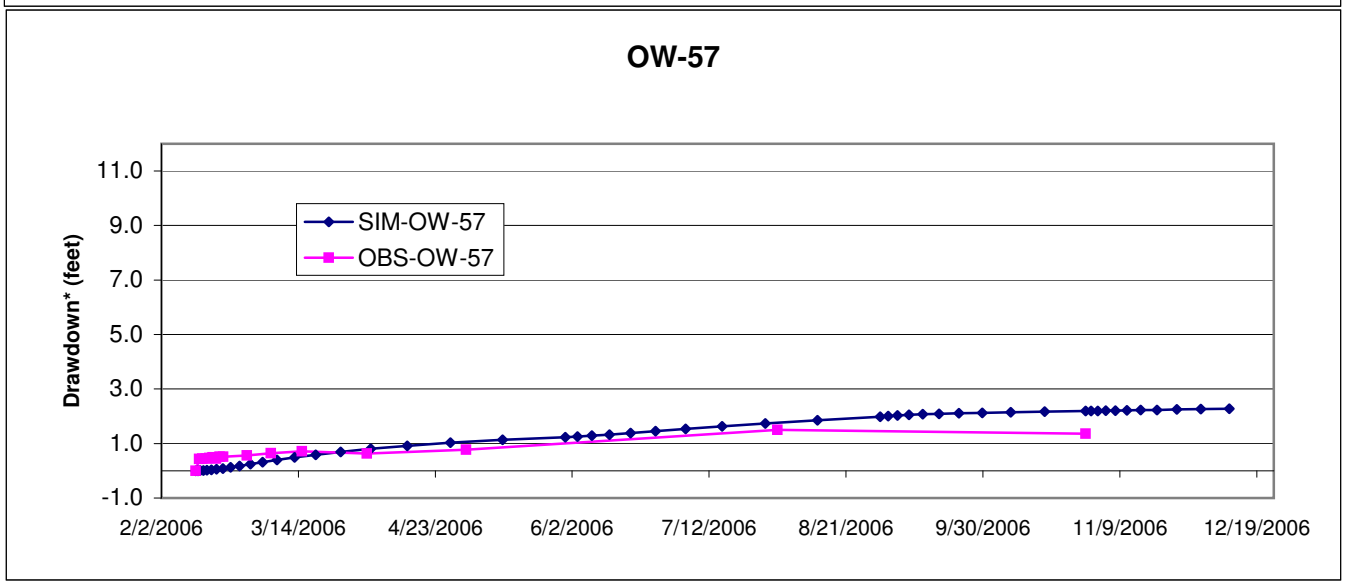


* Drawdown relative to the water level on 2/13/06.

Figure 5.3-11
Simulated and Observed Drawdowns near EW-12, 2002 - 2006

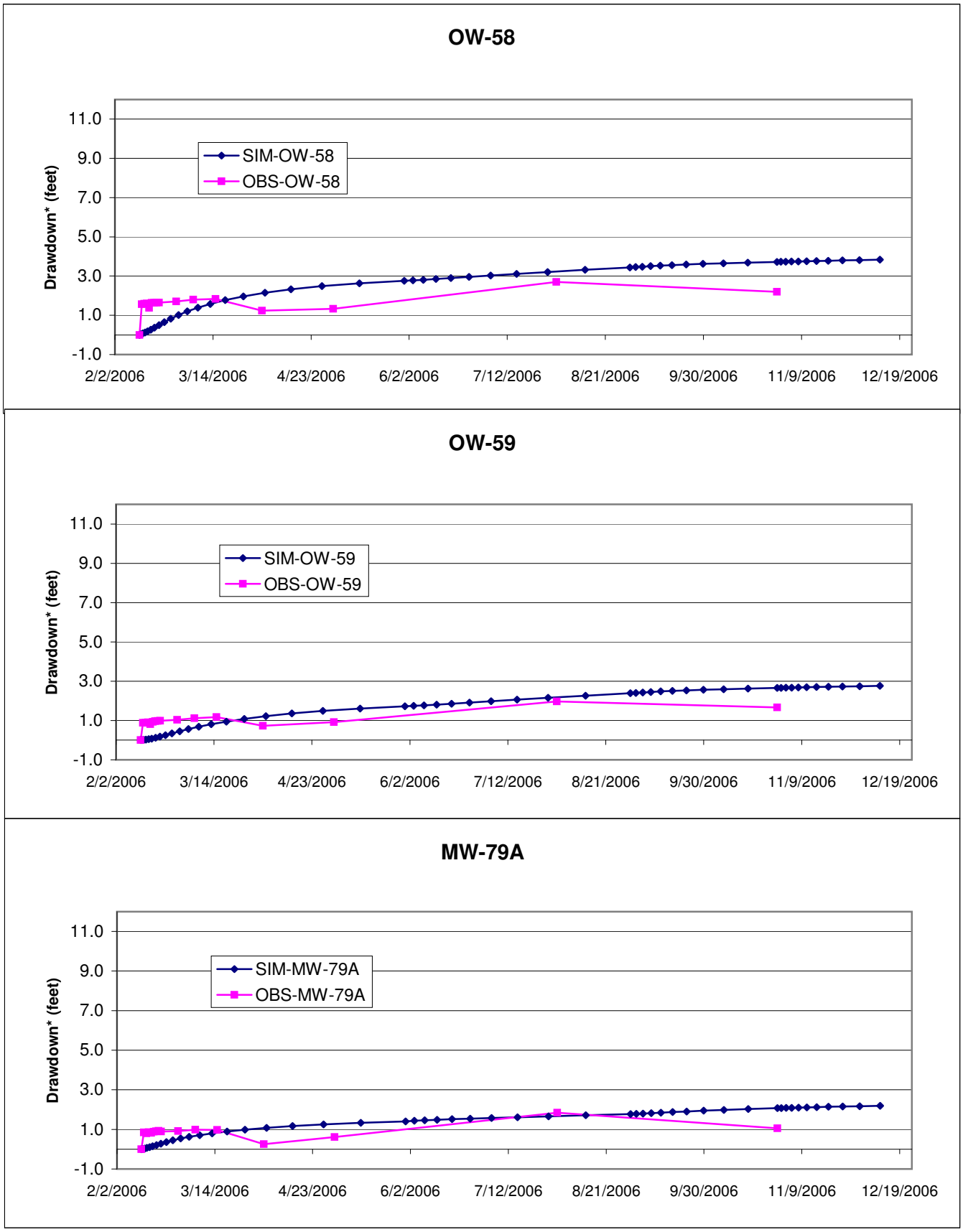






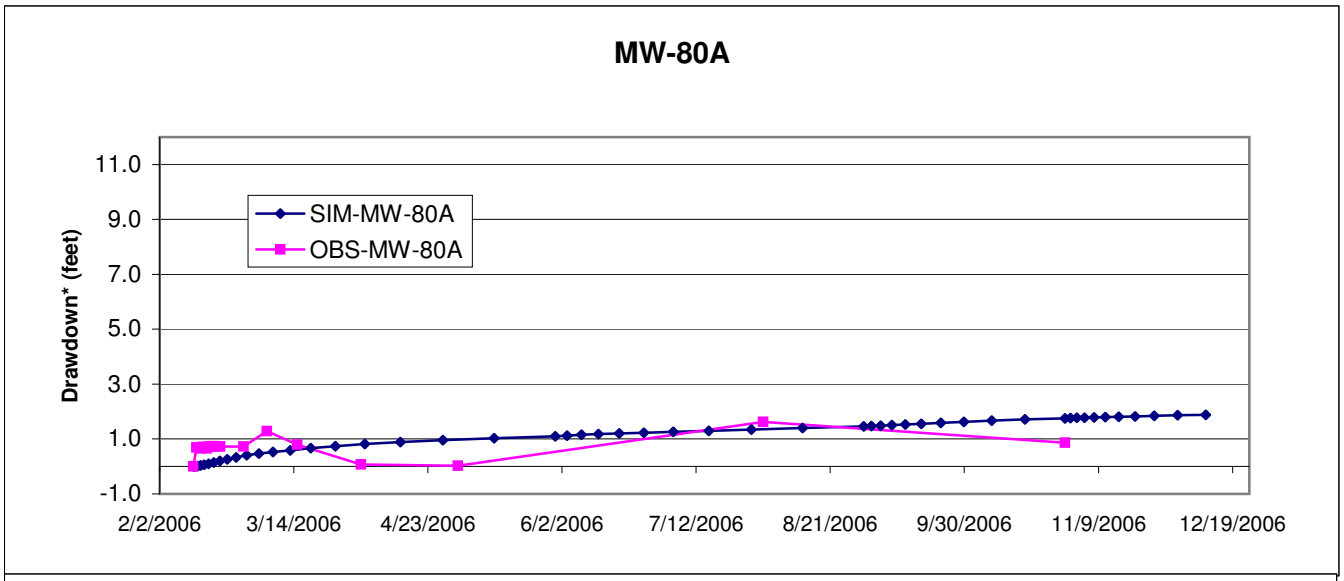
* Drawdown relative to the water level on 2/13/06.

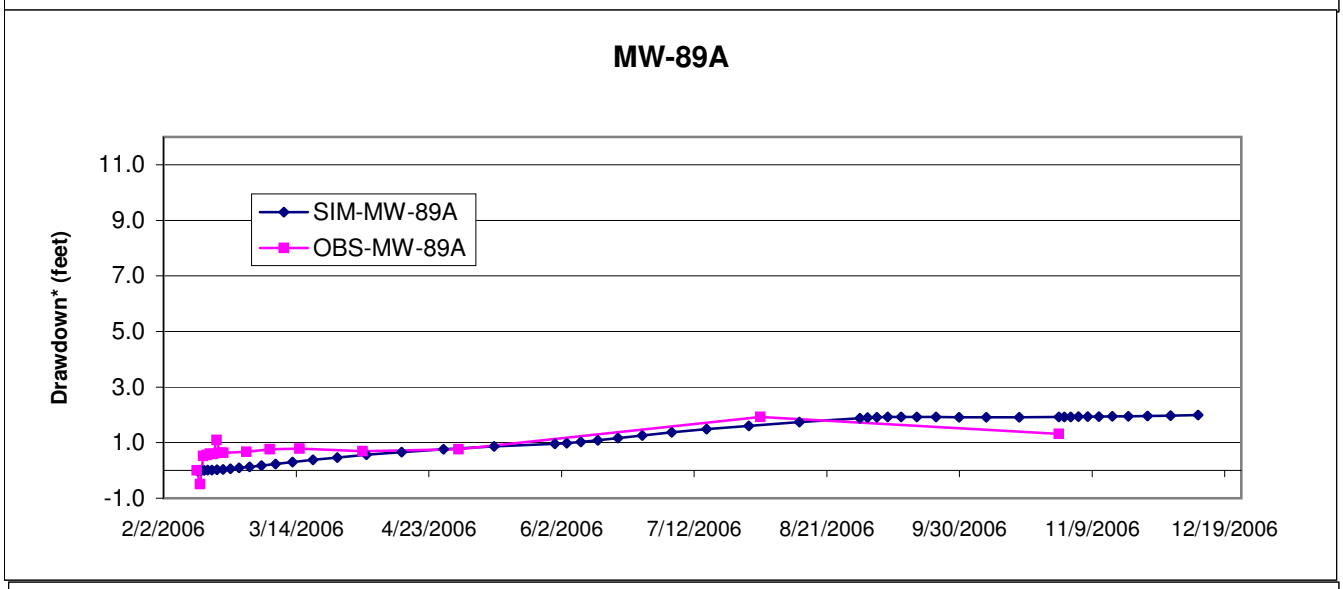
Figure 5.3-11
Simulated and Observed Drawdowns near EW-12, 2002 - 2006

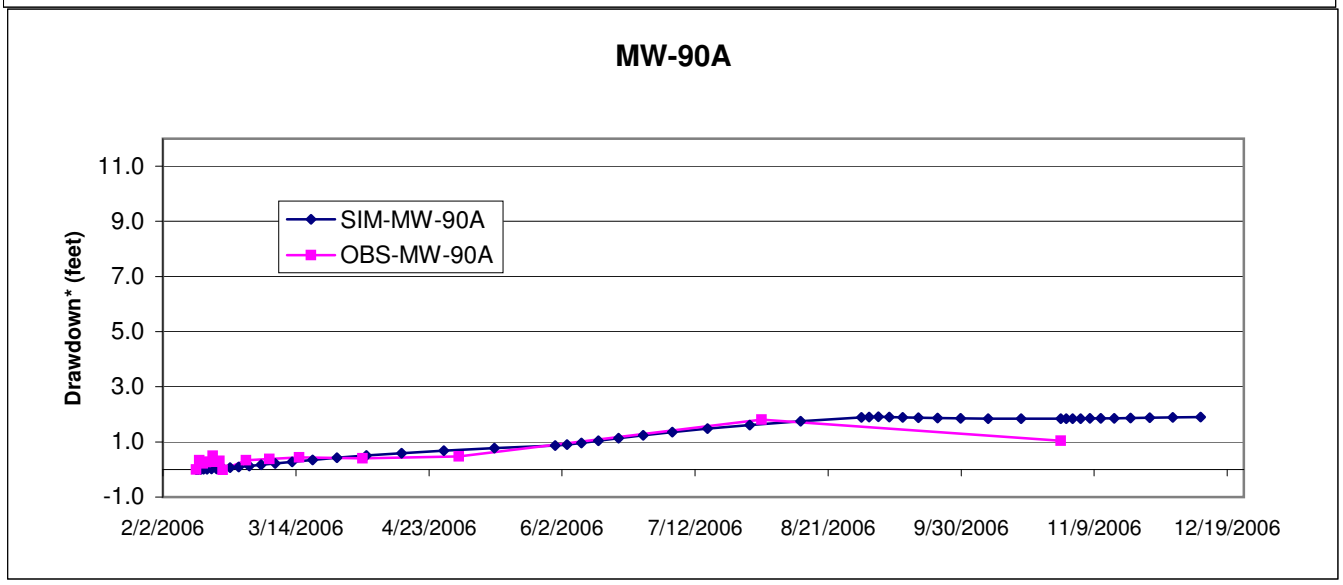


* Drawdown relative to the water level on 2/13/06.

Figure 5.3-11
Simulated and Observed Drawdowns near EW-12, 2002 - 2006

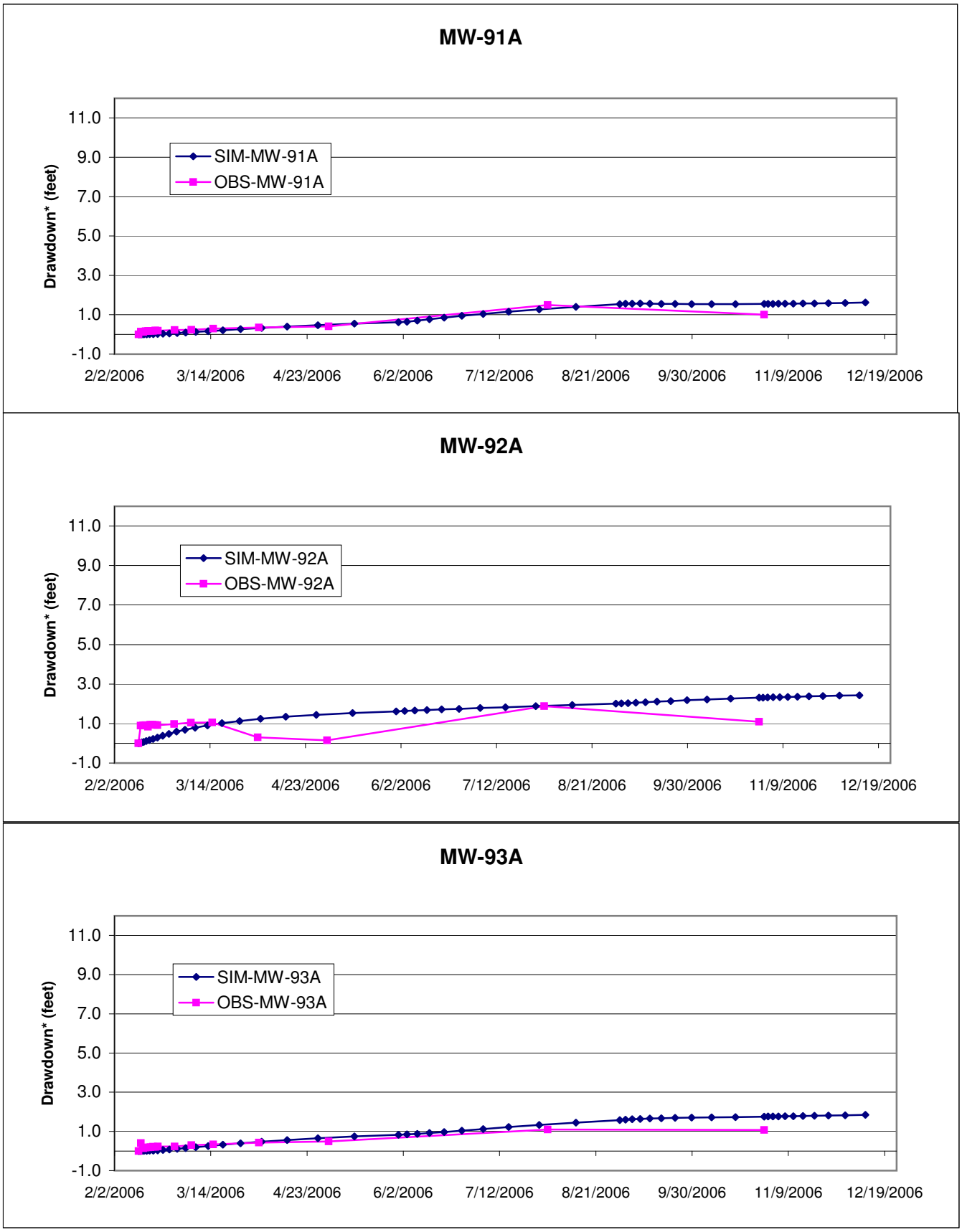






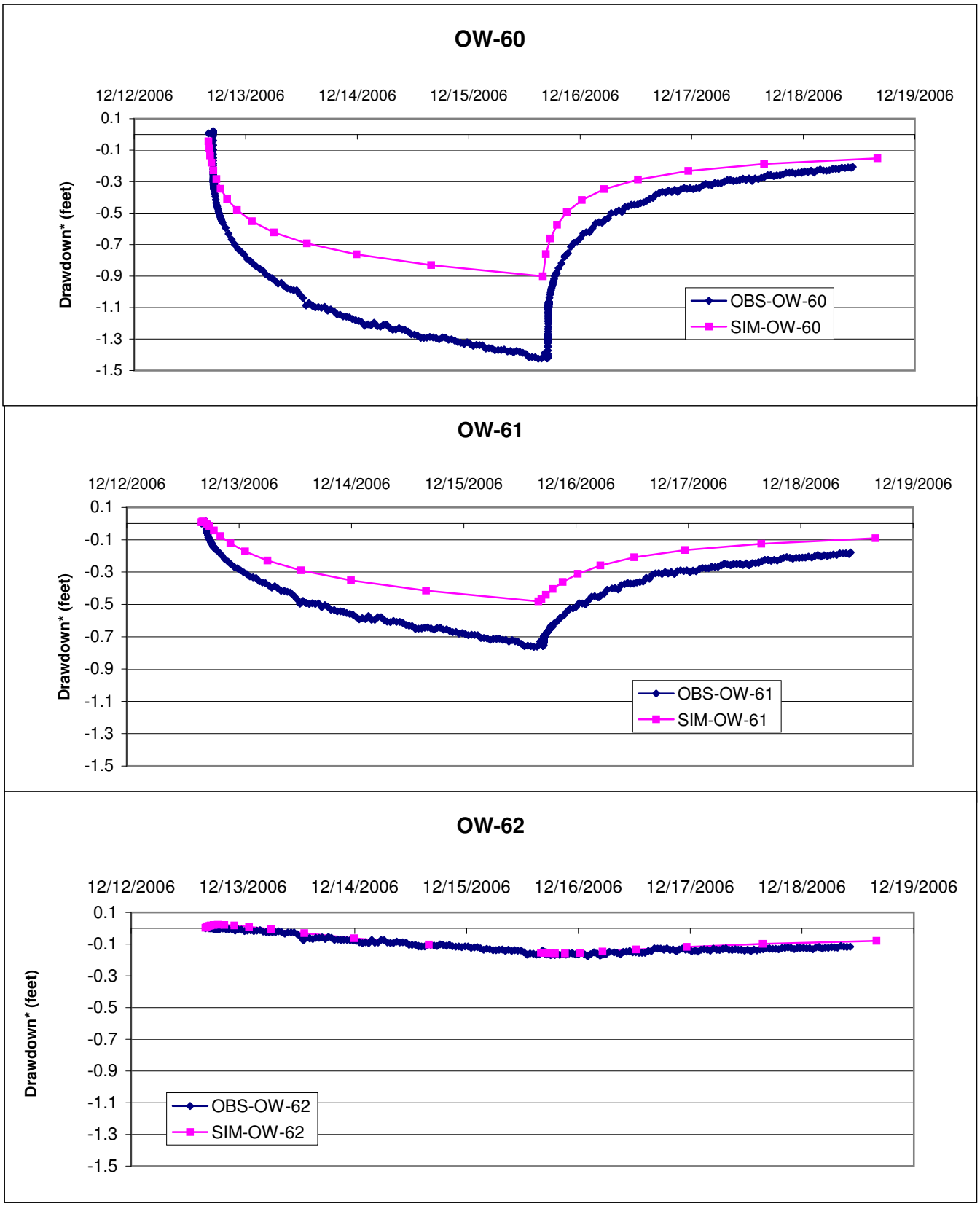
* Drawdown relative to the water level on 2/13/06.

Figure 5.3-11
Simulated and Observed Drawdowns near EW-12, 2002 - 2006



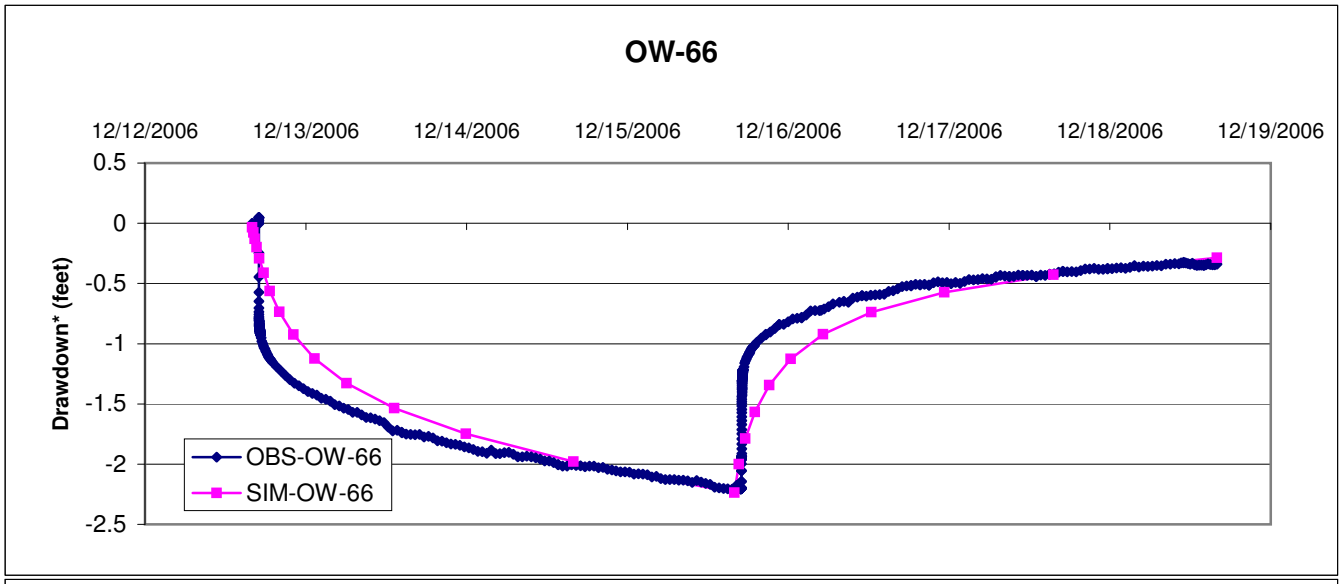
* Drawdown relative to the water level on 2/13/06.

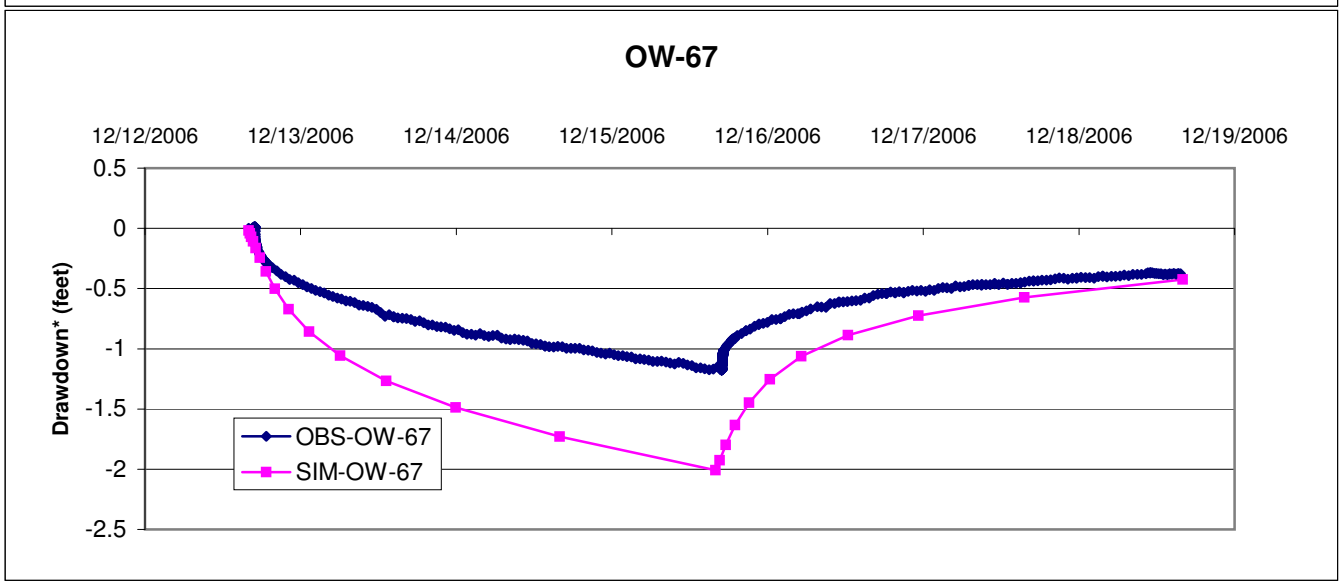
Figure 5.4-1
Simulated and Observed Drawdowns during Shutdown Test at EW-4



* Drawdown relative to the water level of 4:00 P.M. 12/12/06.

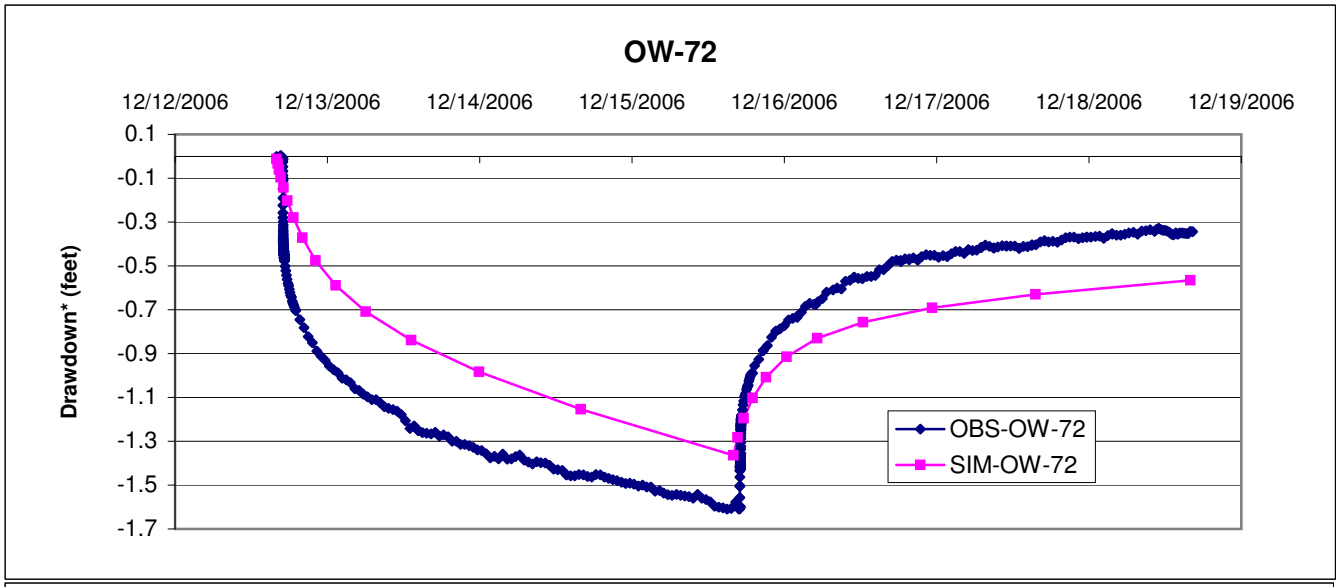
Figure 5.4-2
Simulated and Observed Drawdowns during Shutdown Test at EW-6

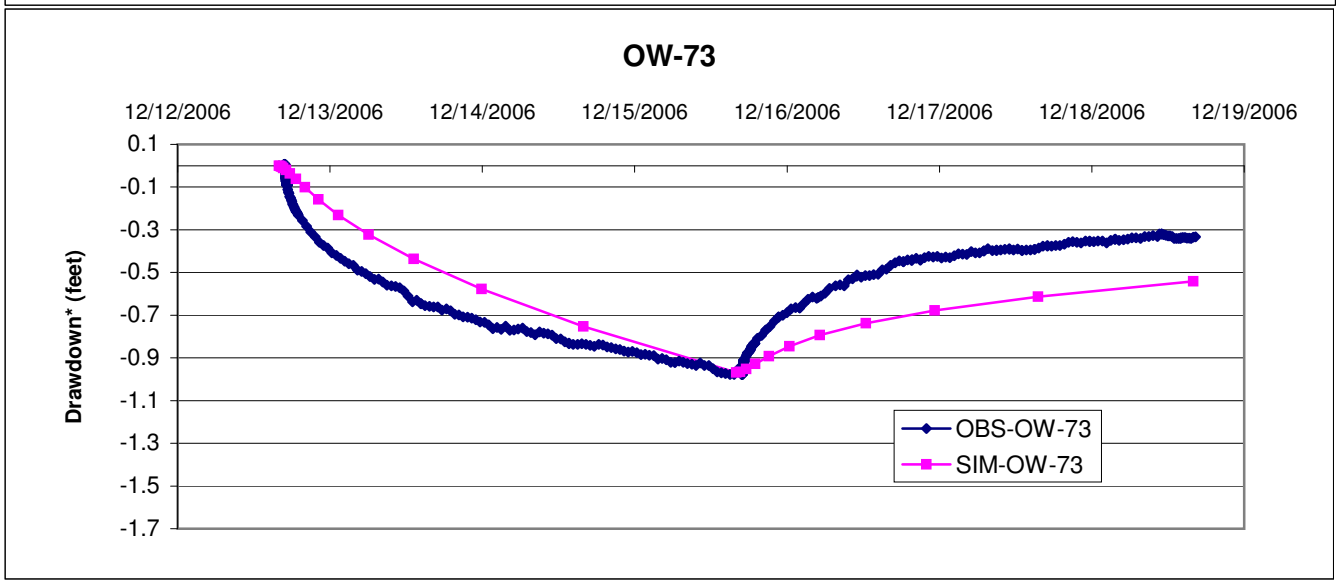




* Drawdown relative to the water level of 4:00 P.M. 12/12/06.

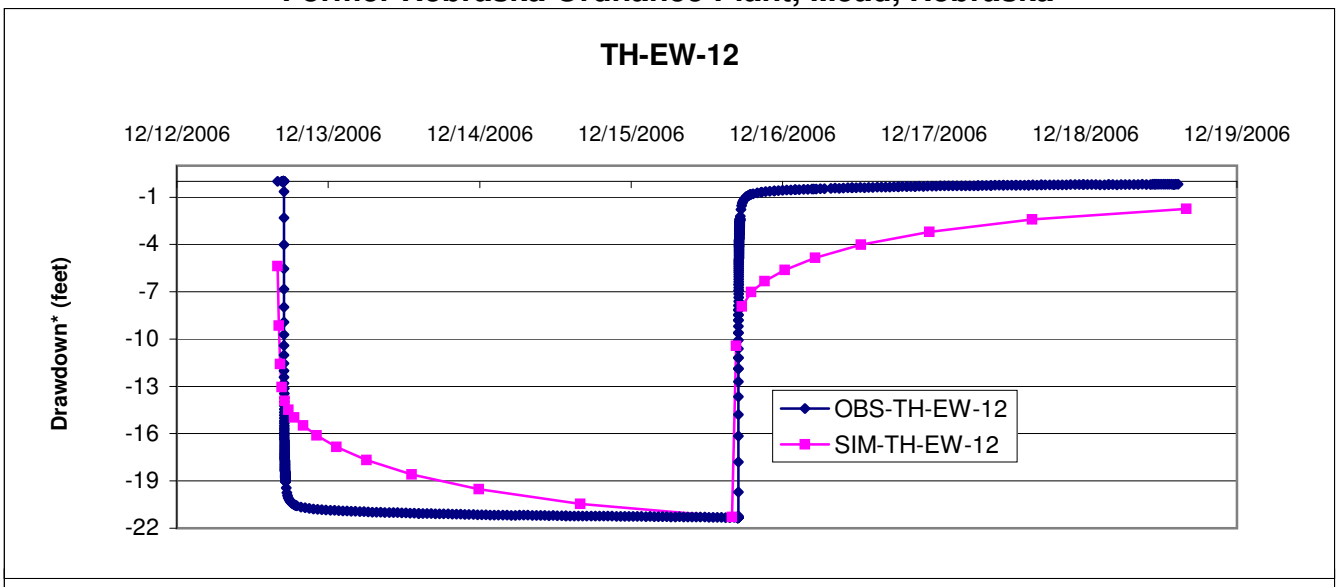
Figure 5.4-3
Simulated and Observed Drawdowns during Shutdown Test at EW-9

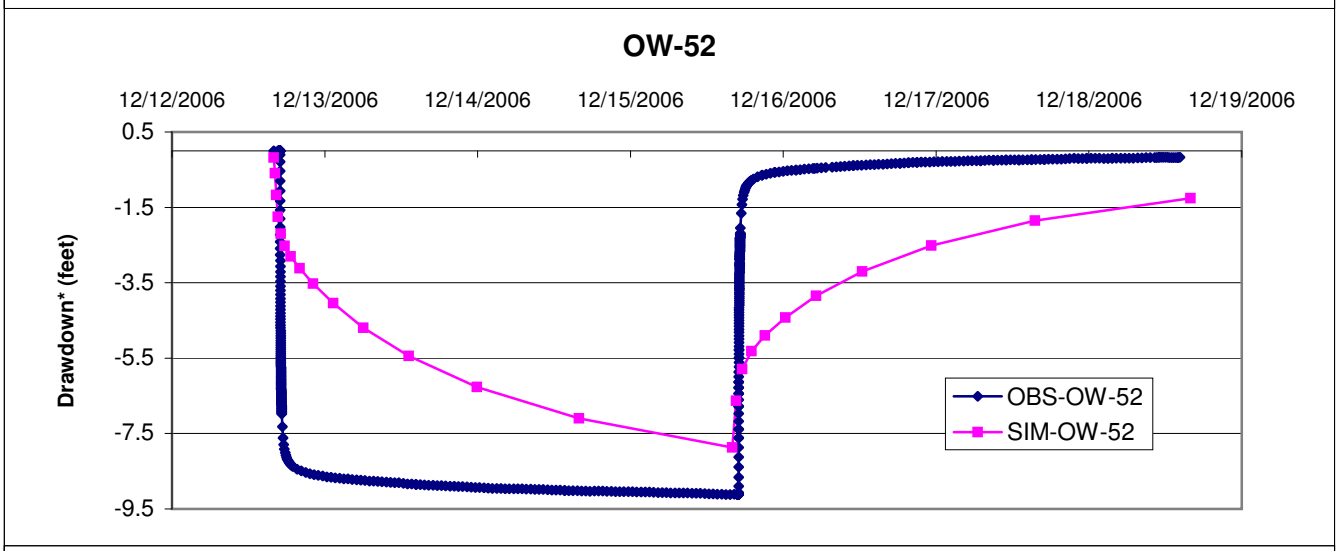


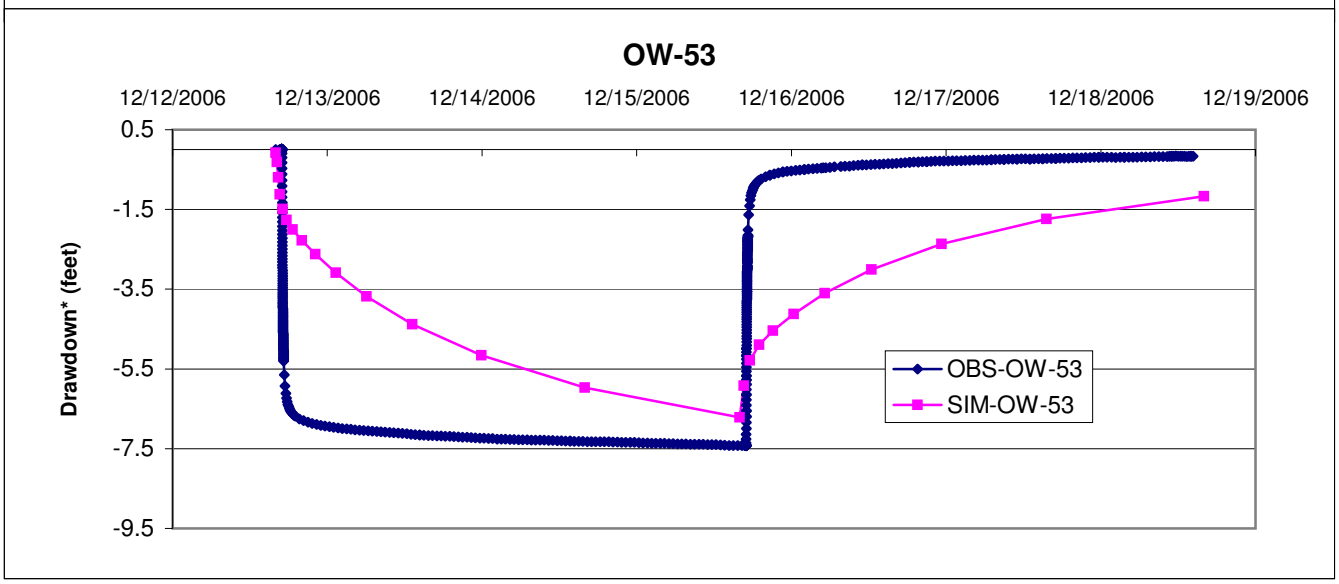


* Drawdown relative to the water level of 4:00 P.M. 12/12/06.

Figure 5.4-4
Simulated and Observed Drawdowns during Shutdown Test at EW-12
Former Nebraska Ordnance Plant, Mead, Nebraska

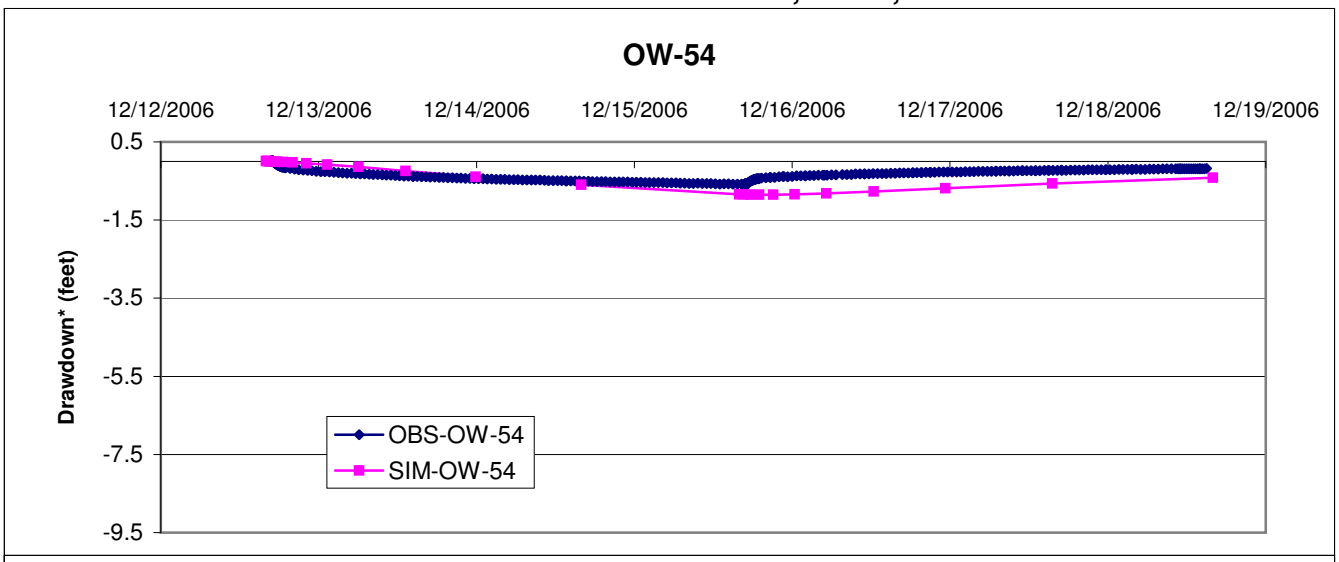


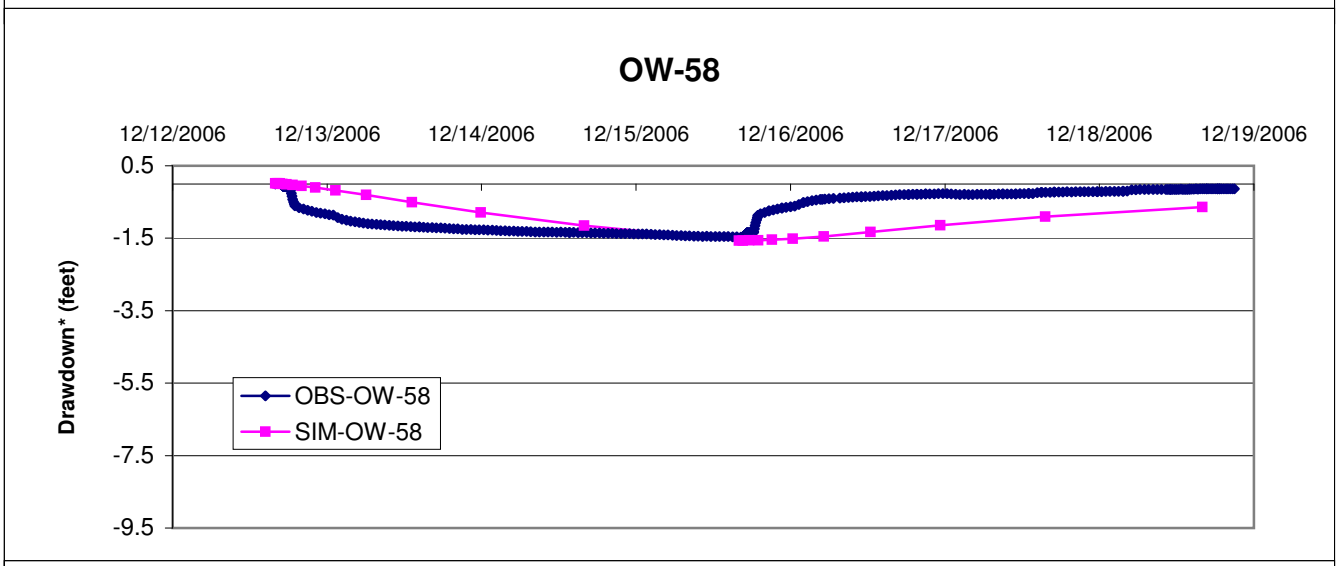


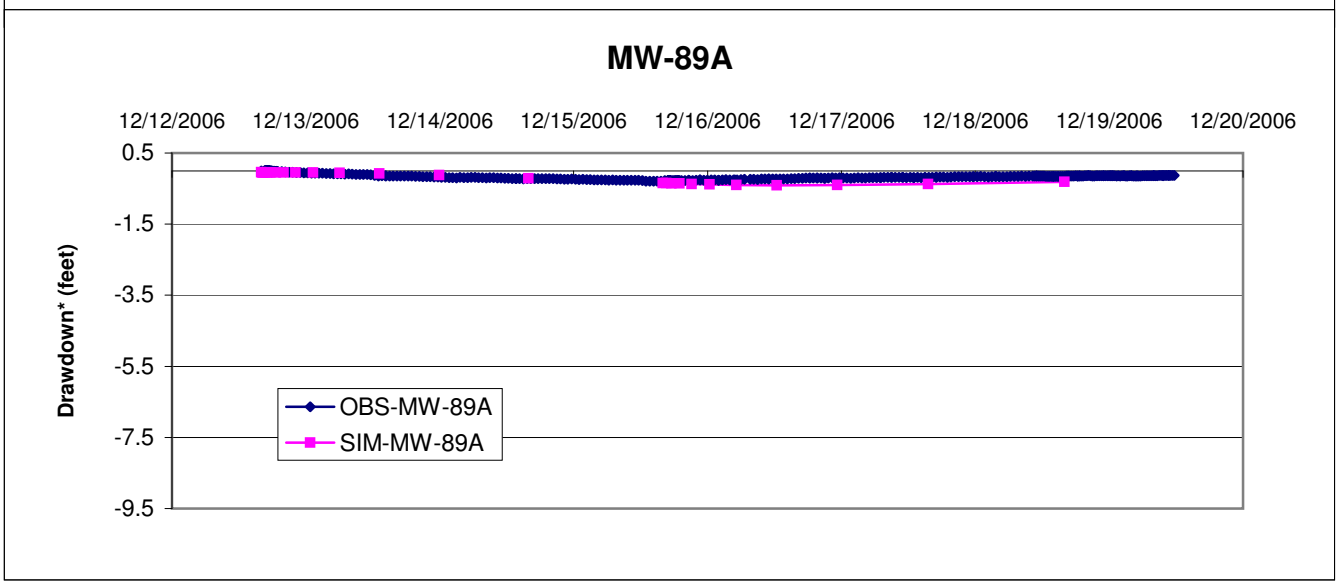


* Drawdown relative to the water level of 4:00 P.M. 12/12/06.

Figure 5.4-4
Simulated and Observed Drawdowns during Shutdown Test at EW-12
Former Nebraska Ordnance Plant, Mead, Nebraska

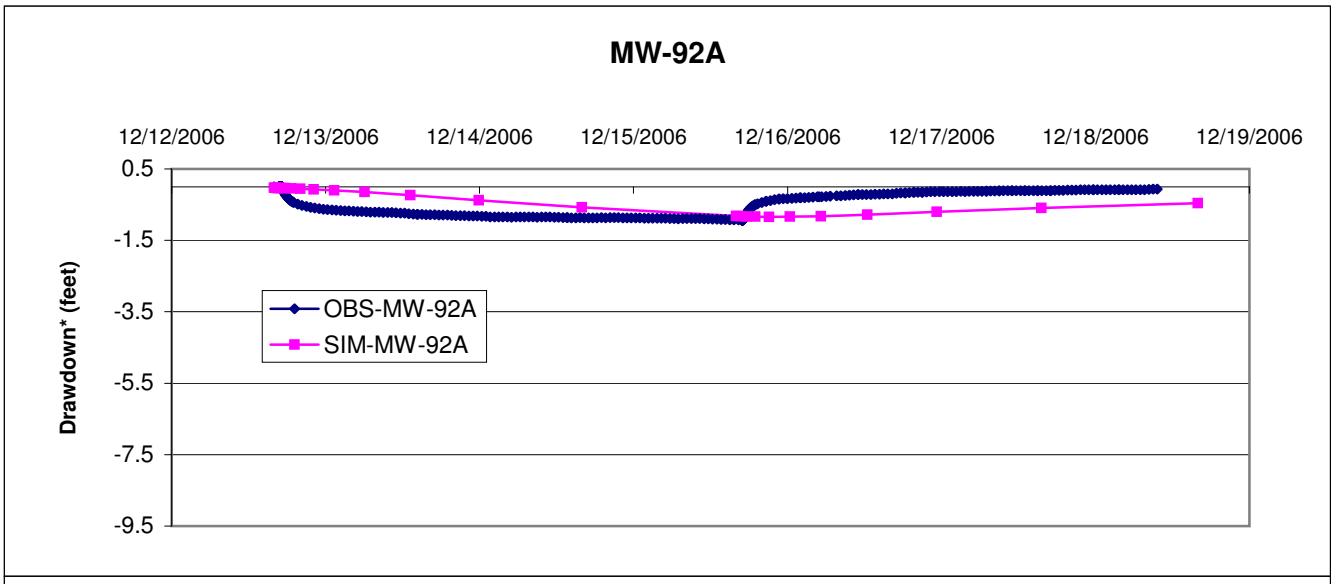


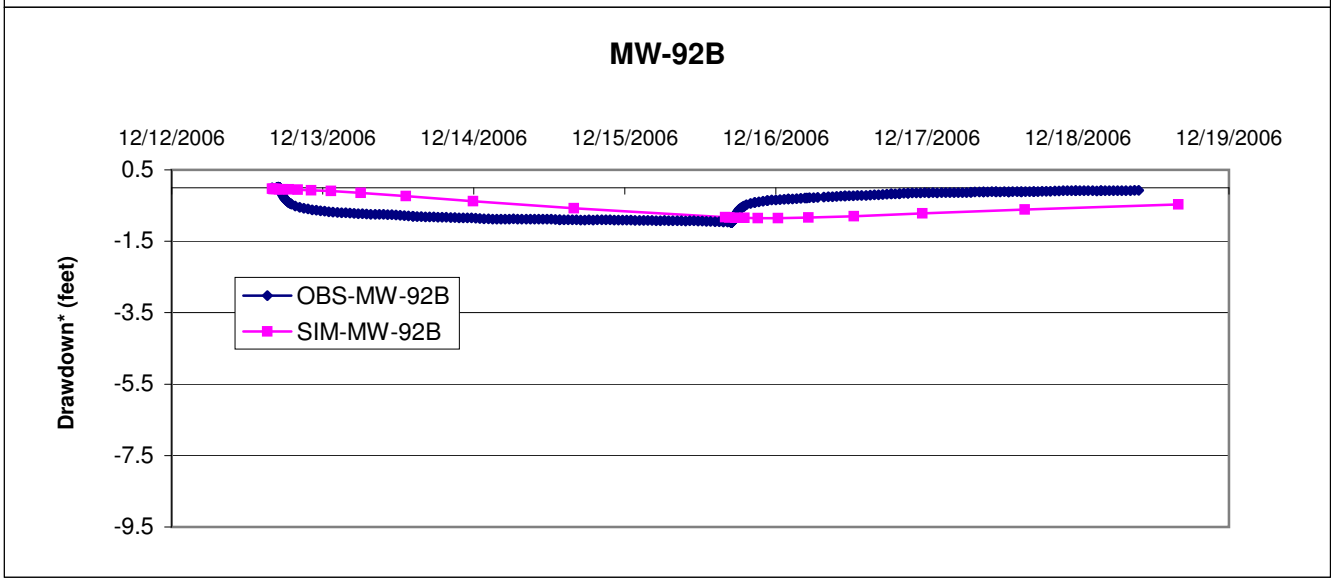




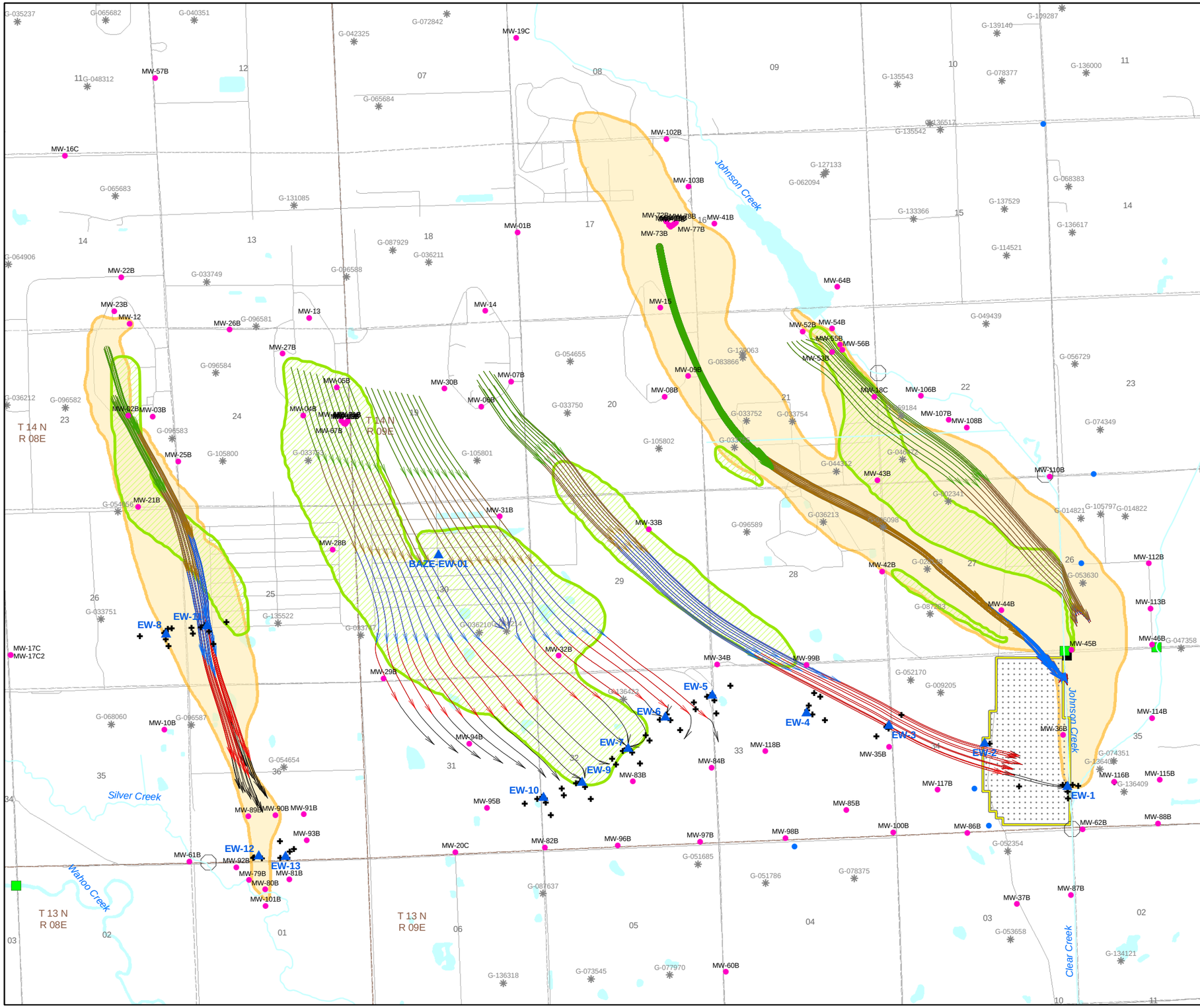
* Drawdown relative to the water level of 4:00 P.M. 12/12/06.

Figure 5.4-4
Simulated and Observed Drawdowns during Shutdown Test at EW-12
Former Nebraska Ordnance Plant, Mead, Nebraska





* Drawdown relative to the water level of 4:00 P.M. 12/12/06.



Explanation

- USACE Extraction Well
- USACE Monitoring Well (Shallow)
- Lower Platte North Natural Resource District Observation Well
- USACE Observation Well
- Irrigation Well

Surface Water Sampling Locations

- USACE Surface Water Measurement Locations
- MUD March 2005 Surface Water Measurement Locations
- USGS Stream Gauge
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)
- Agricultural Drain
- Path 1960-1970
- Path 1971-1980
- Path 1981-1990
- Path 1991-2000
- Path 2001-2005

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 3,000 6,000 Feet

URS

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

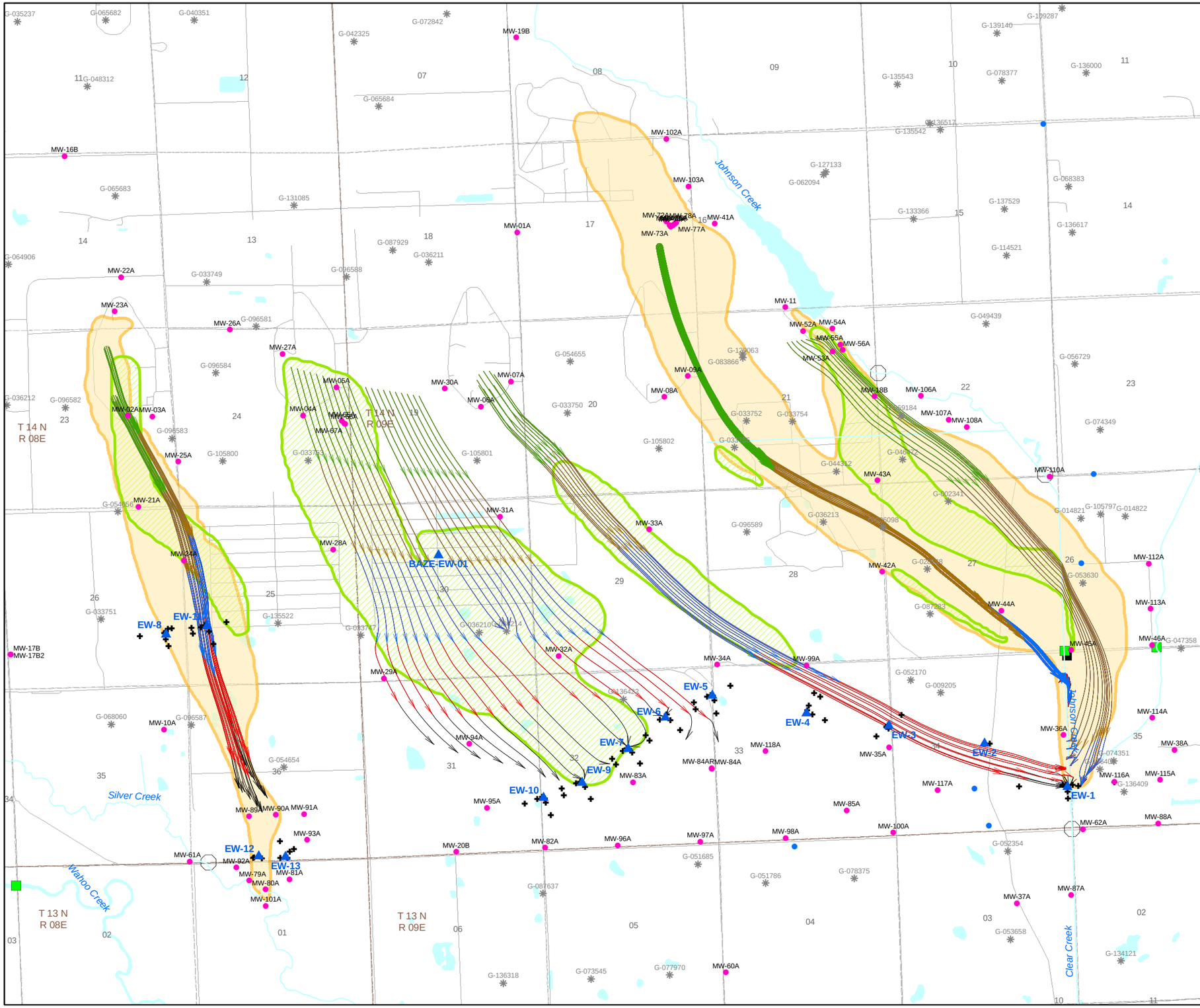
Designed by: CMZ
Drawn by: JLC
Checked by: MEW
Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Particle Tracking of Plume Migration Pathways from 1961 to 2005, Particles Initiated in Layer 2

Scale:
Date: May 2007
Fig. No.:
Figure Number: 6.1-1



Explanation

- USACE Extraction Well
- USACE Monitoring Well (Intermediate)
- Lower Platte North Natural Resource District Observation Well
- USACE Observation Well
- Irrigation Well

Surface Water Sampling Locations

- USACE Surface Water Measurement Locations
- MUD March 2005 Surface Water Measurement Locations
- USGS Stream Gauge
- TCE Plume 2006* (5 µg/L)
- RDX Plume 2006* (2 µg/L)
- Path 1961-1970
- Path 1971-1980
- Path 1981-1990
- Path 1991-2000
- Path 2001-2005

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 3,000 6,000 Feet

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KANSAS CITY, MISSOURI

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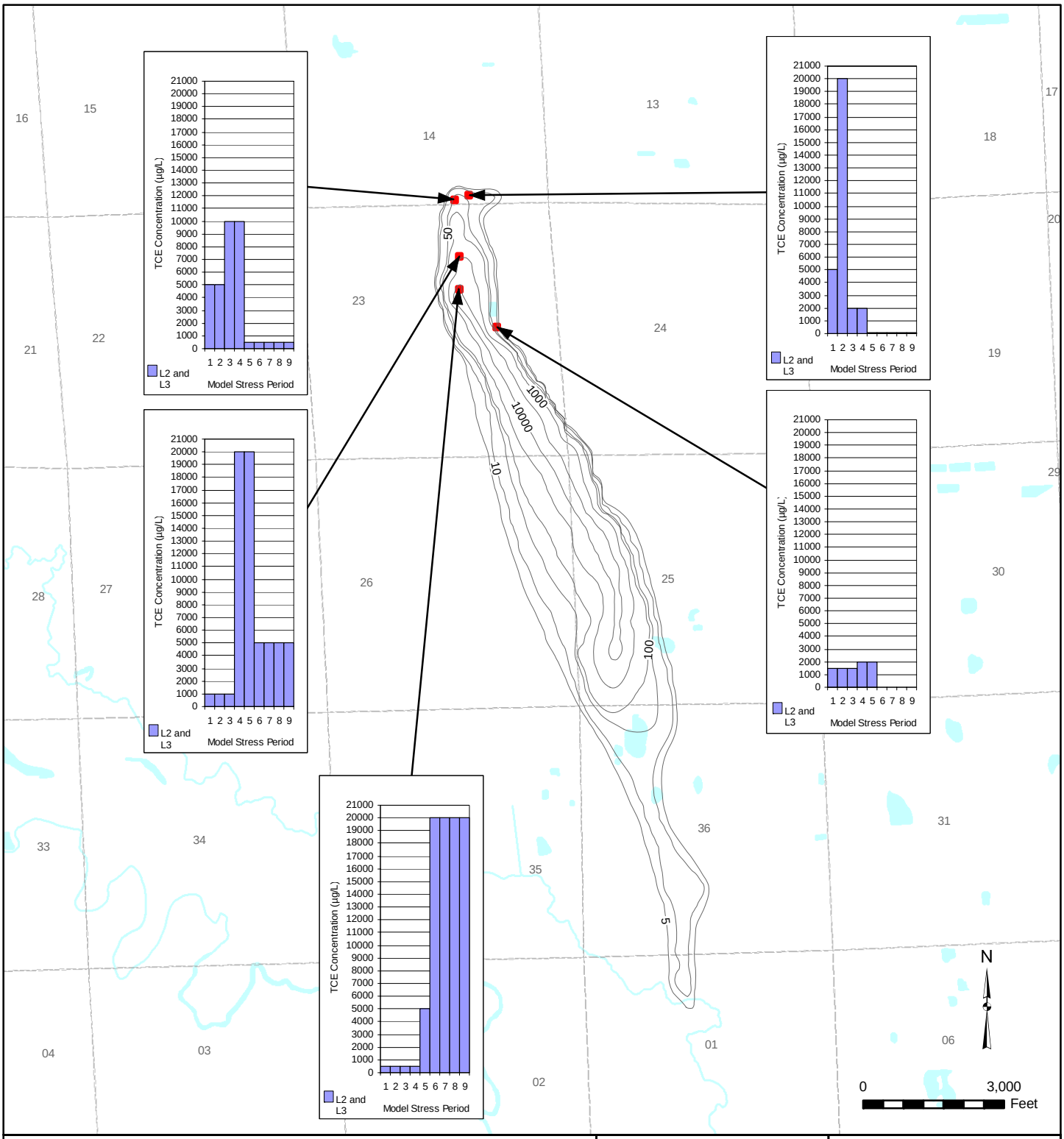
Checked by: MEW
Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Particle Tracking of Plume Migration Pathways from 1961 to 2005, Particles Initiated in Layer 3

Scale:
Date: May 2007
Fig. No.:
Figure Number: **6.1-2**



Explanation

Source concentration cell with temporal variable concentration

TCE Shallow Plume 2006

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2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

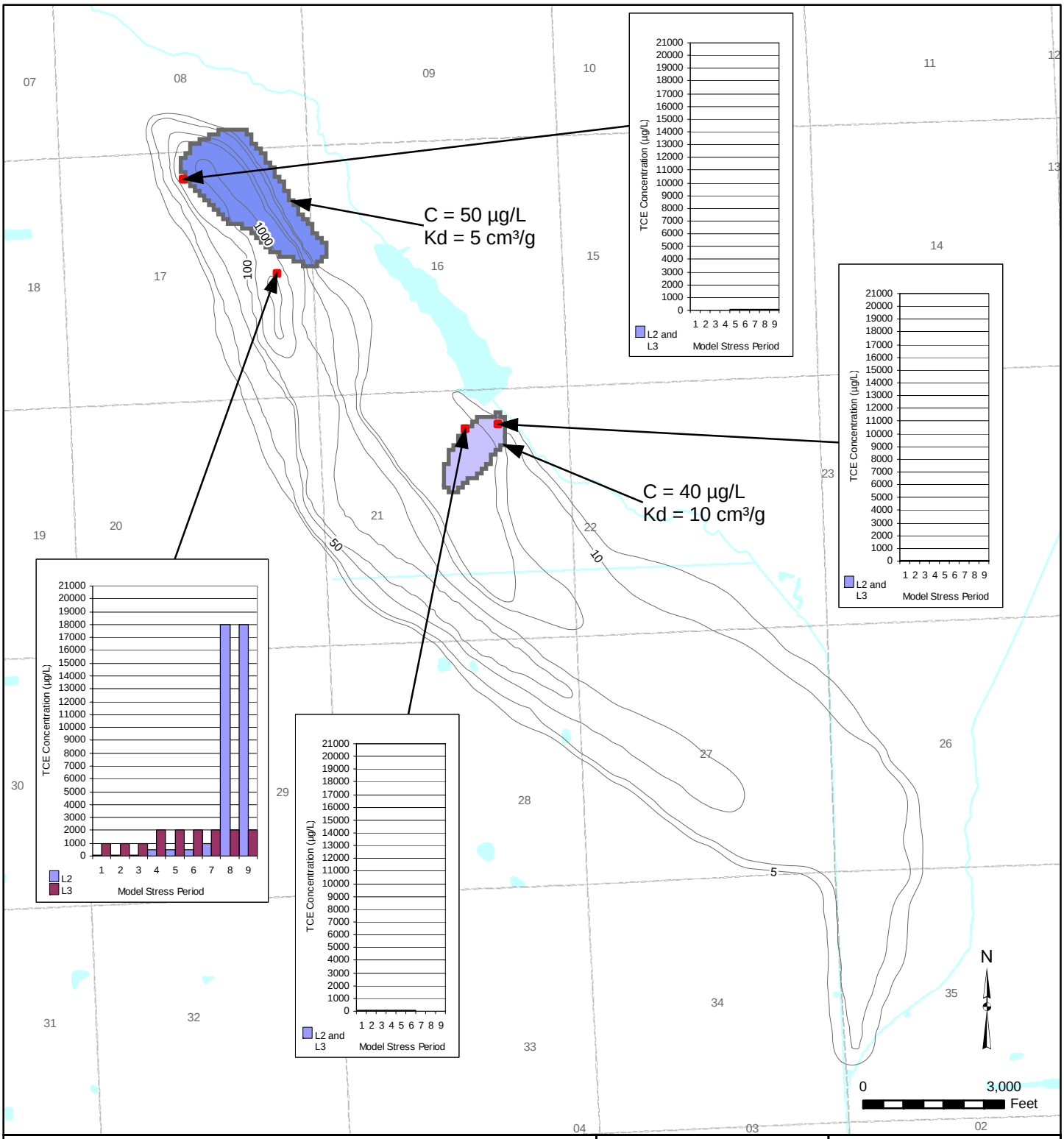
Assumed TCE Source Locations and Status at LL1

Scale:

Date: May 2007

Fig. No.:

Figure Number: 6.2-1



Explanation

- Area with specified initial concentration and high Kd
- Source concentration cell with temporal variable concentration
- TCE Shallow Plume 2006

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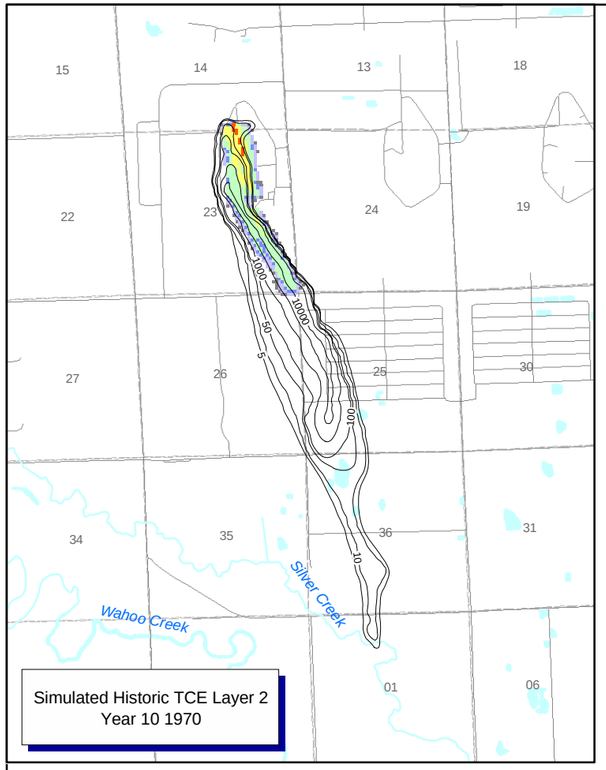
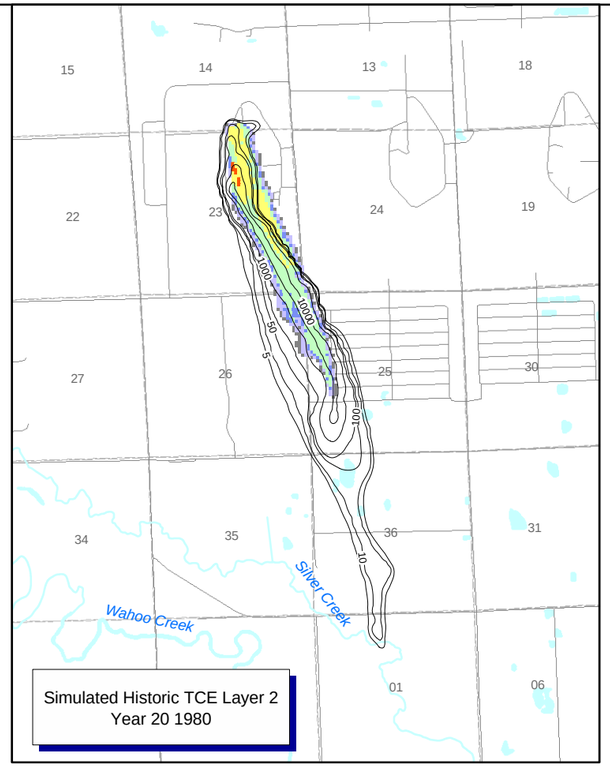
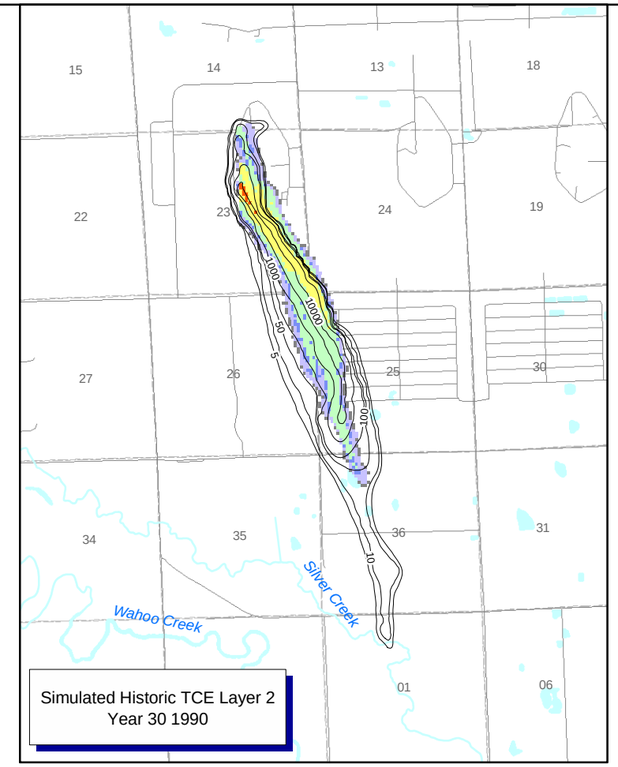
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

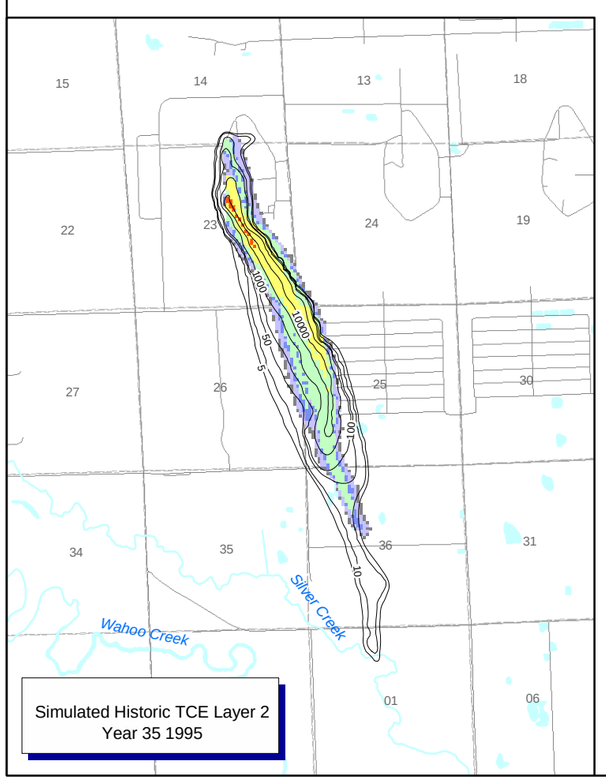
Assumed TCE Source Locations and Status at AMA

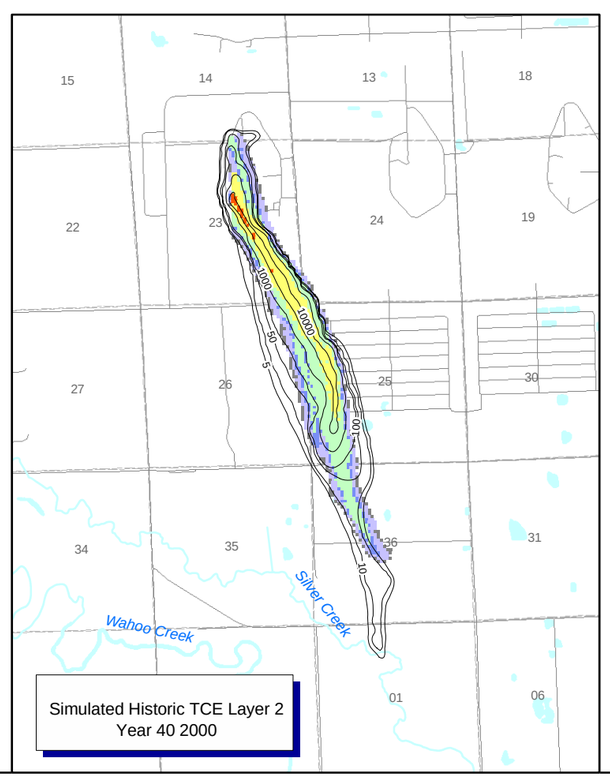
Designed by:	CMZ
Drawn by:	JLC
Checked by:	MEW
Submitted by:	LAT
Scale:	
Date:	May 2007
Fig. No.:	
Figure Number:	6.2-2

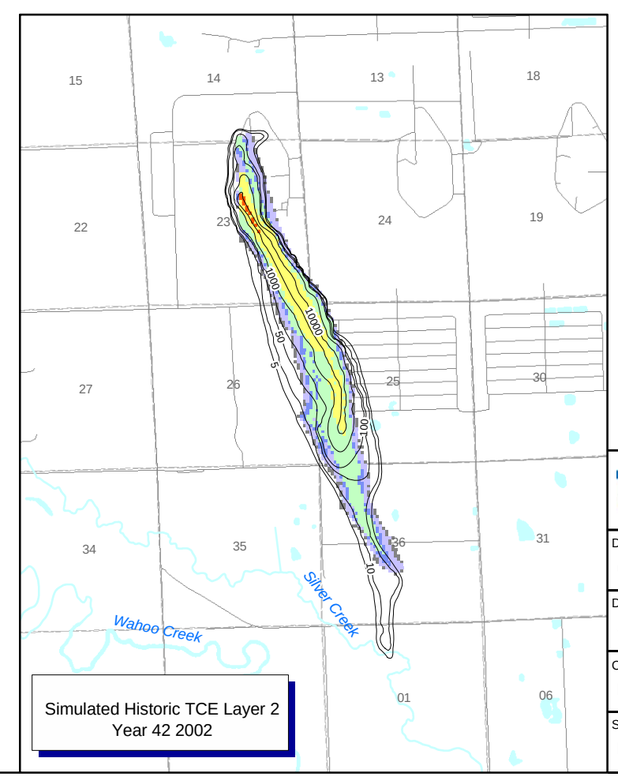












Explanation

Interpreted TCE Plume 2006* (µg/L)

Simulated TCE Concentration (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- 100 - 1000
- 1000 - 10000
- 10000 - 40000

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 5,000 10,000 Feet

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KANSAS CITY, MISSOURI

Designed by: CMZ

Drawn by: JLC

Checked by: MEW

Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

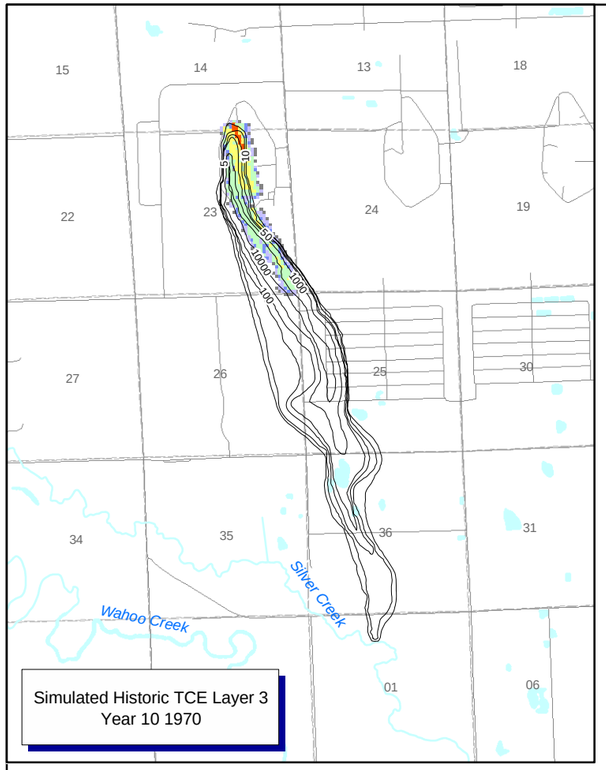
History Matching Simulation of LL1 TCE Plume, Layer 2

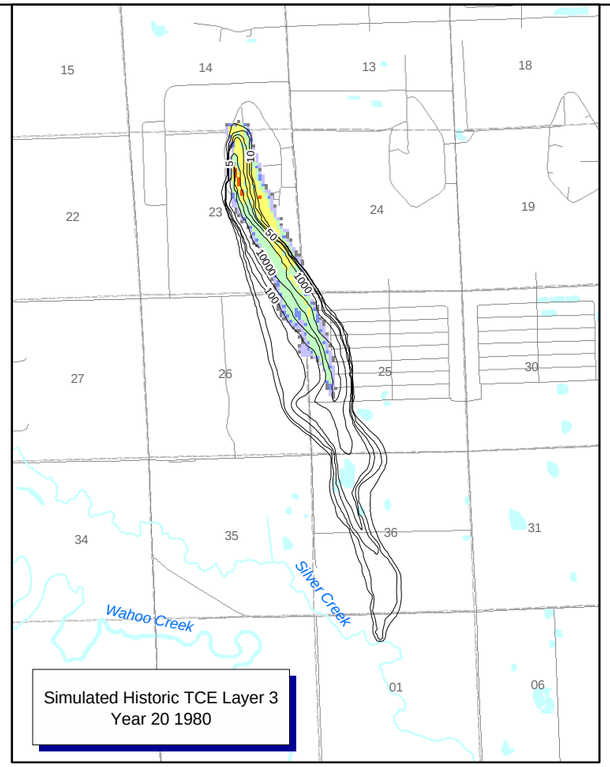
Scale:

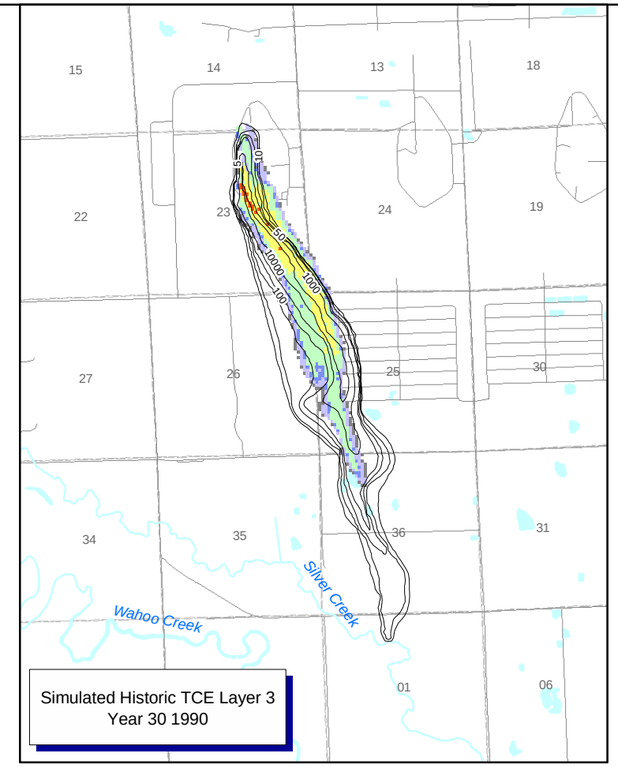
Date: May 2007

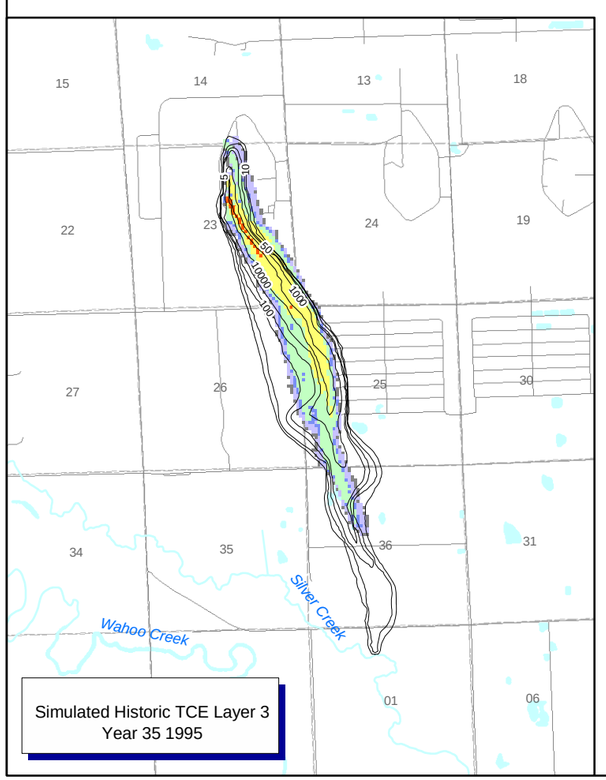
Figure Number: 6.2-3

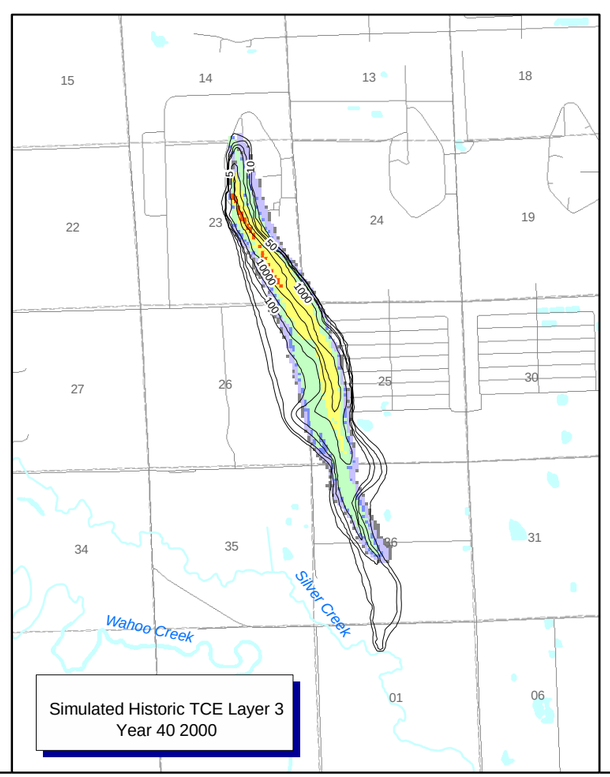
Fig: No.:

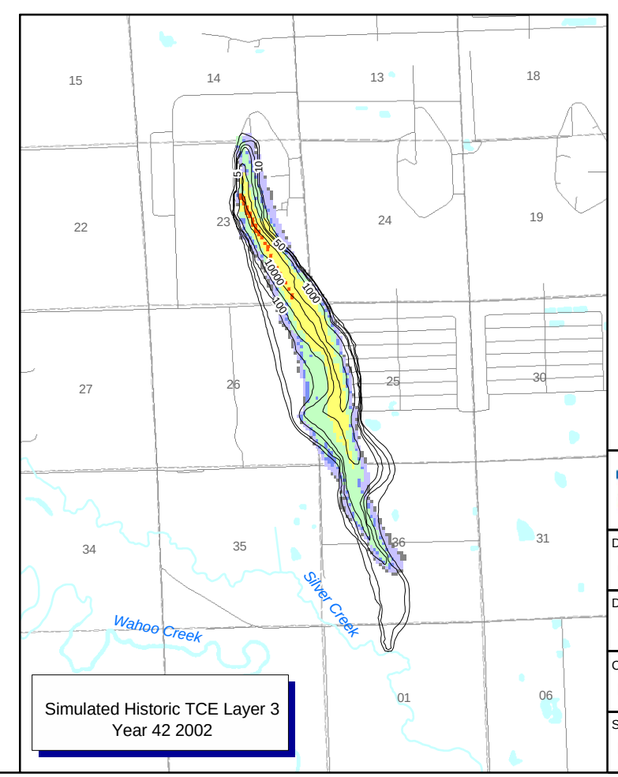












Explanation

Interpreted TCE Plume 2006* (µg/L)

Simulated TCE Concentration (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- 100 - 1000
- 1000 - 10000
- 10000 - 40000

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 5,000 10,000 Feet

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U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: CMZ

Drawn by: JLC

Checked by: MEW

Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

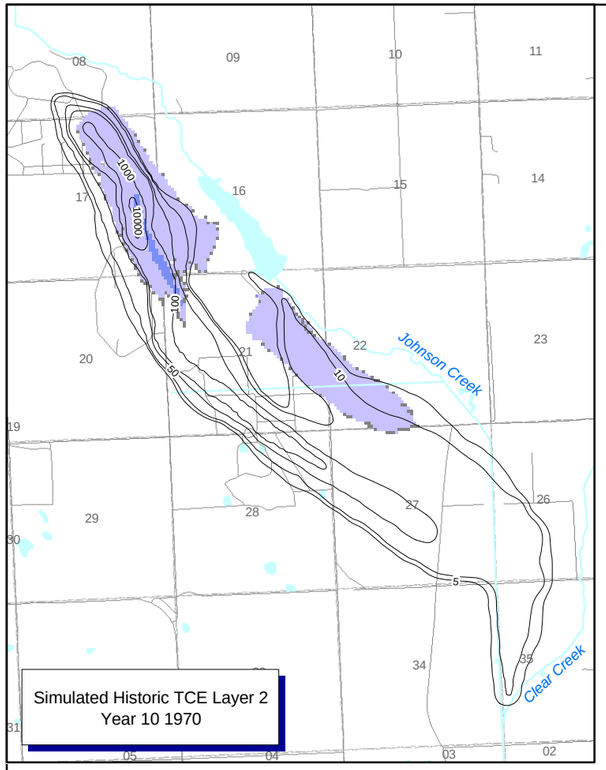
History Matching Simulation of LL1 TCE Plume, Layer 3

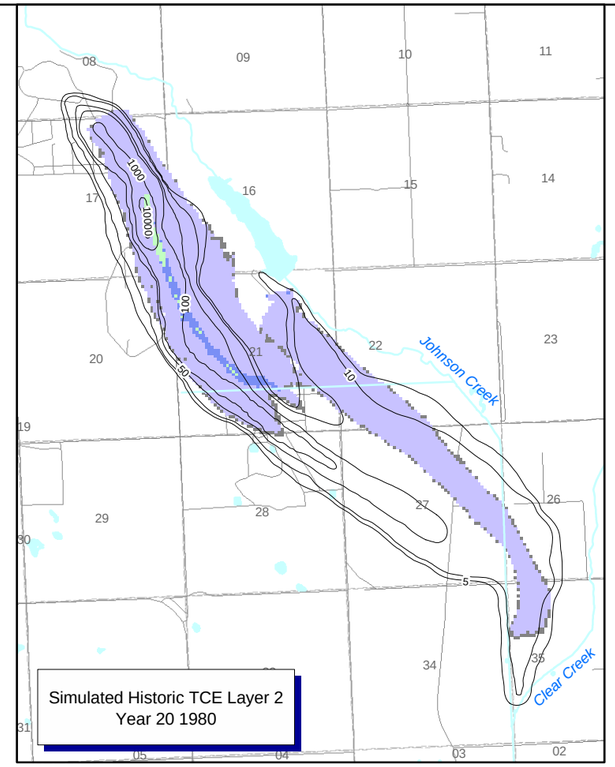
Scale:

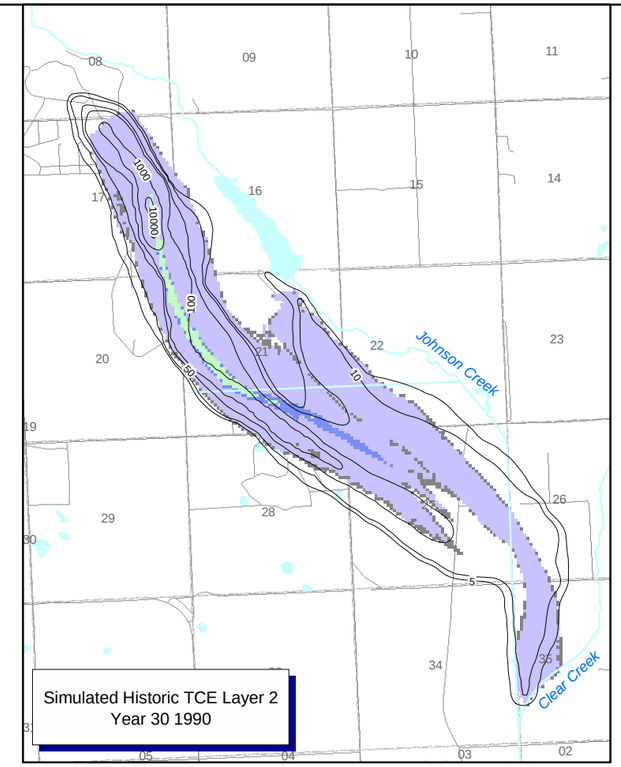
Date: May 2007

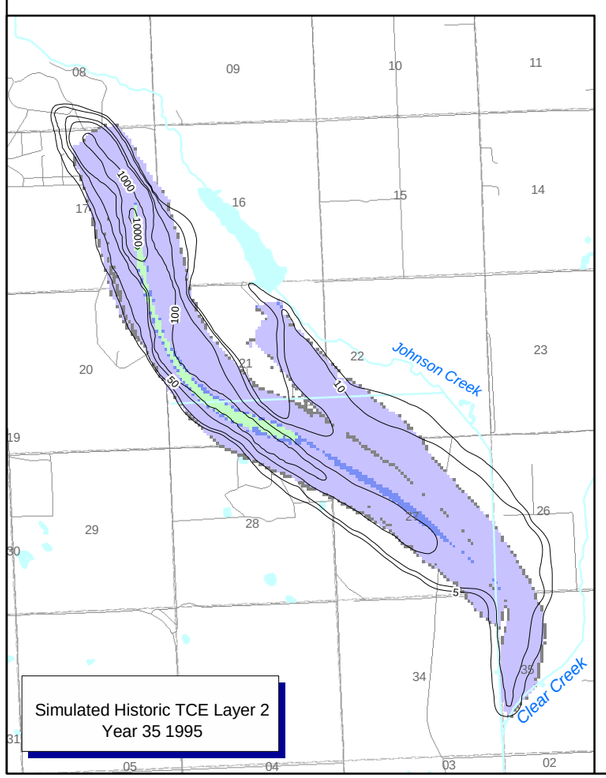
Figure Number: 6.2-4

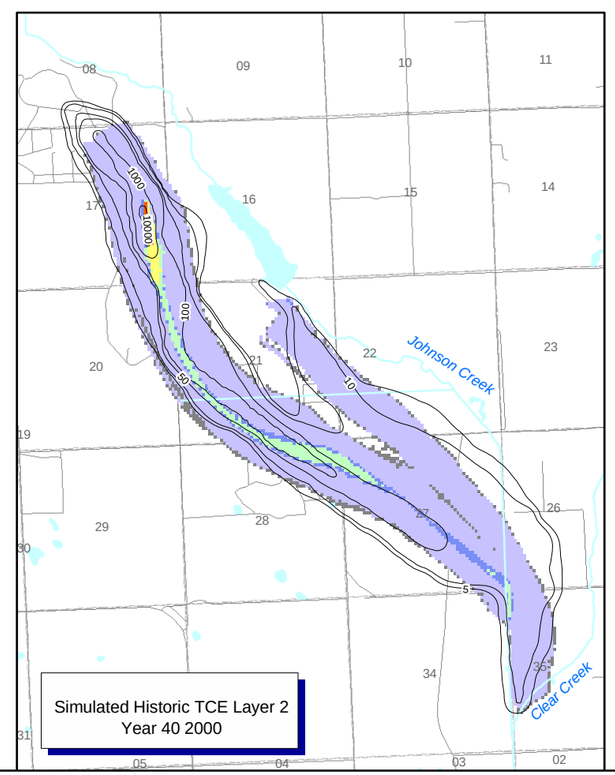
Fig: No.:

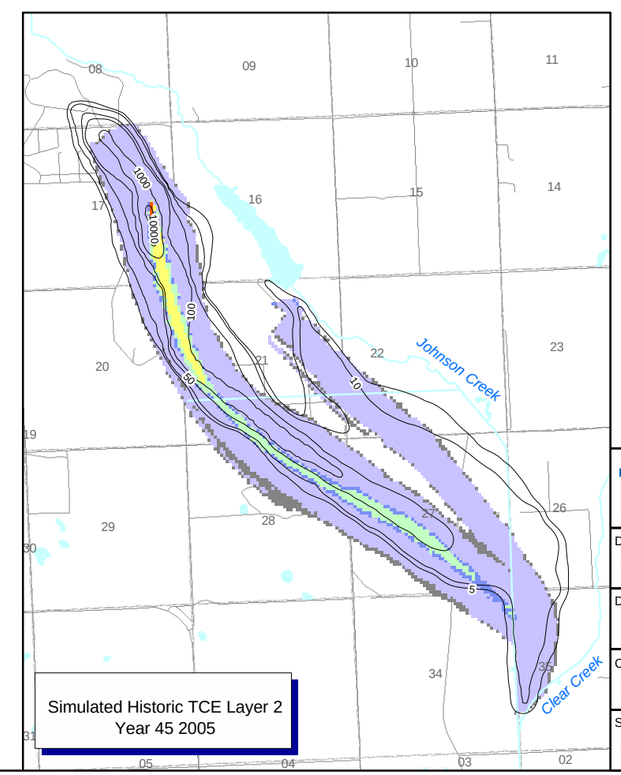












Explanation

Interpreted TCE Plume 2006* (µg/L)

Simulated TCE Concentration (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- 100 - 1000
- 1000 - 10000
- 10000 - 40000

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 5,000 10,000 Feet

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U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: CMZ

Drawn by: JLC

Checked by: MEW

Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

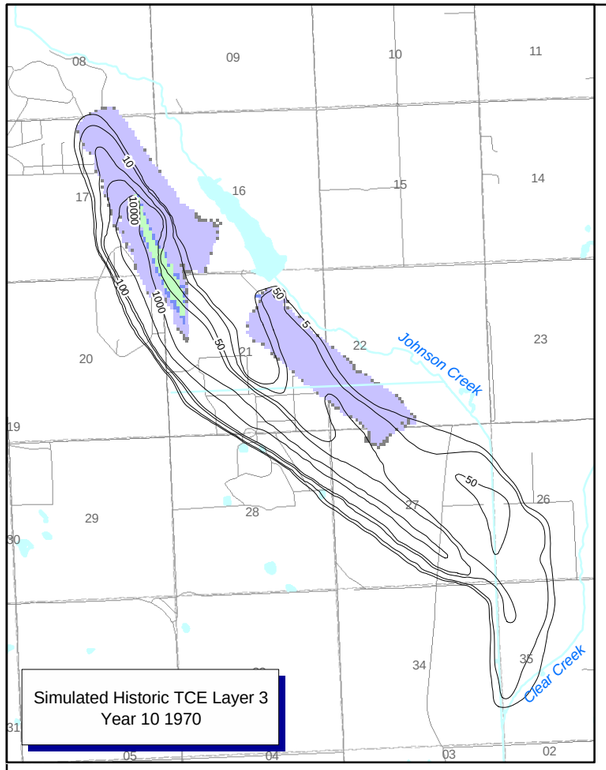
History Matching Simulation of AMA TCE Plume, Layer 2

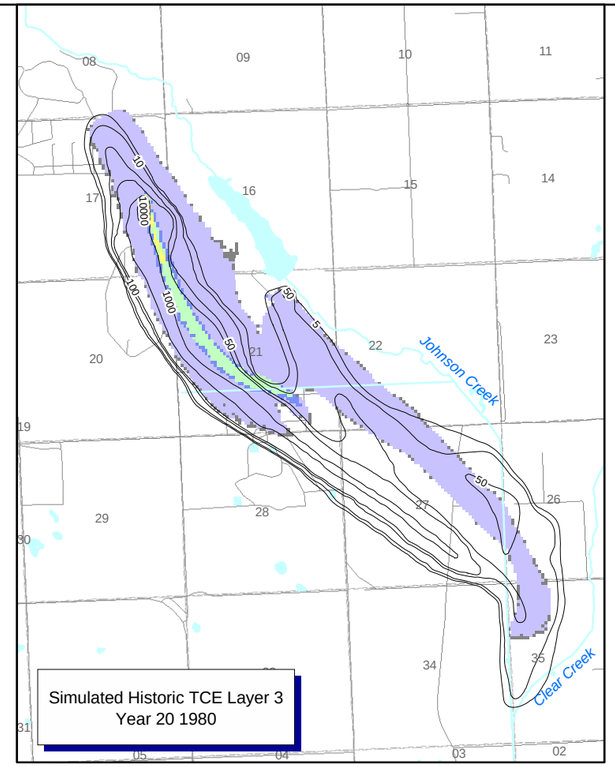
Scale:

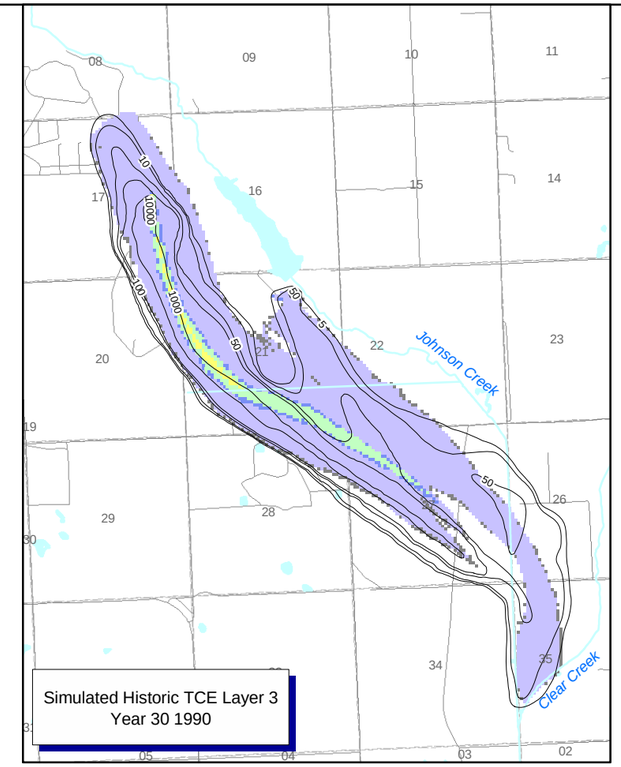
Date: May 2007

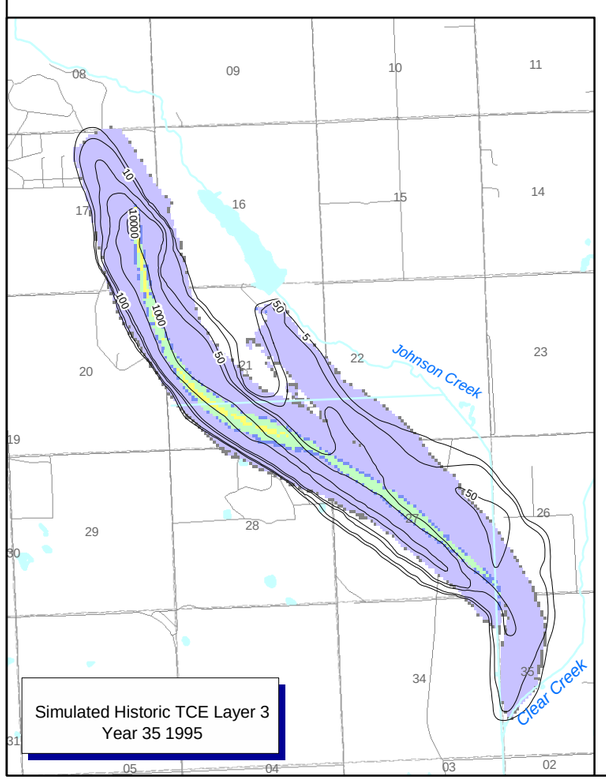
Figure Number: 6.2-5

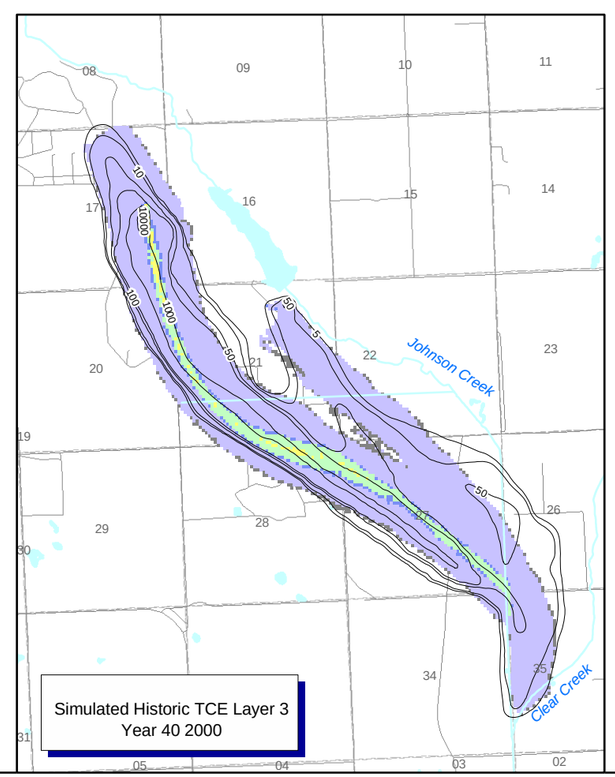
Fig. No.:

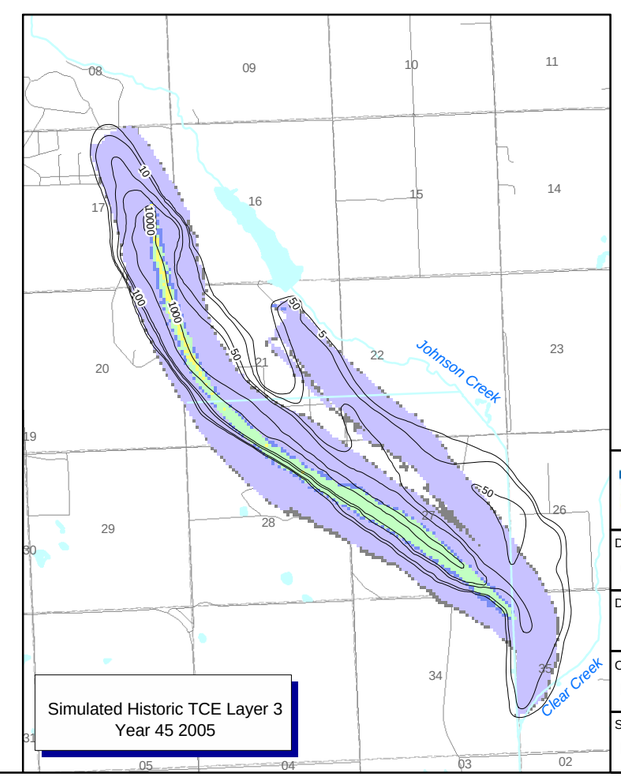












Explanation

Interpreted TCE Plume 2006* (µg/L)

Simulated TCE Concentration (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- 100 - 1000
- 1000 - 10000
- 10000 - 40000

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 5,000 10,000 Feet

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CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: CMZ

Drawn by: JLC

Checked by: MEW

Submitted by: LAT

U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

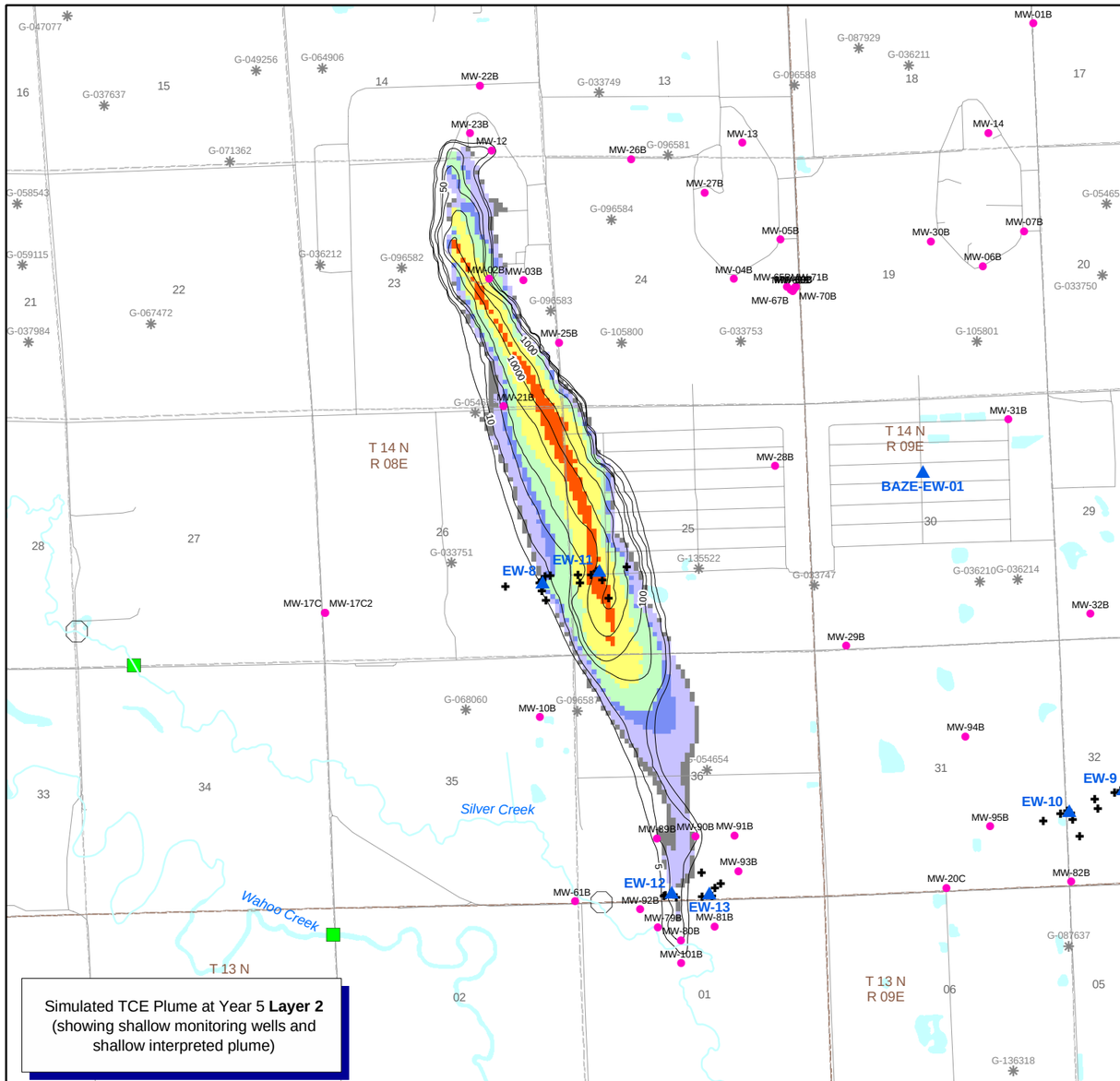
History Matching Simulation of AMA TCE Plume, Layer 3

Scale:

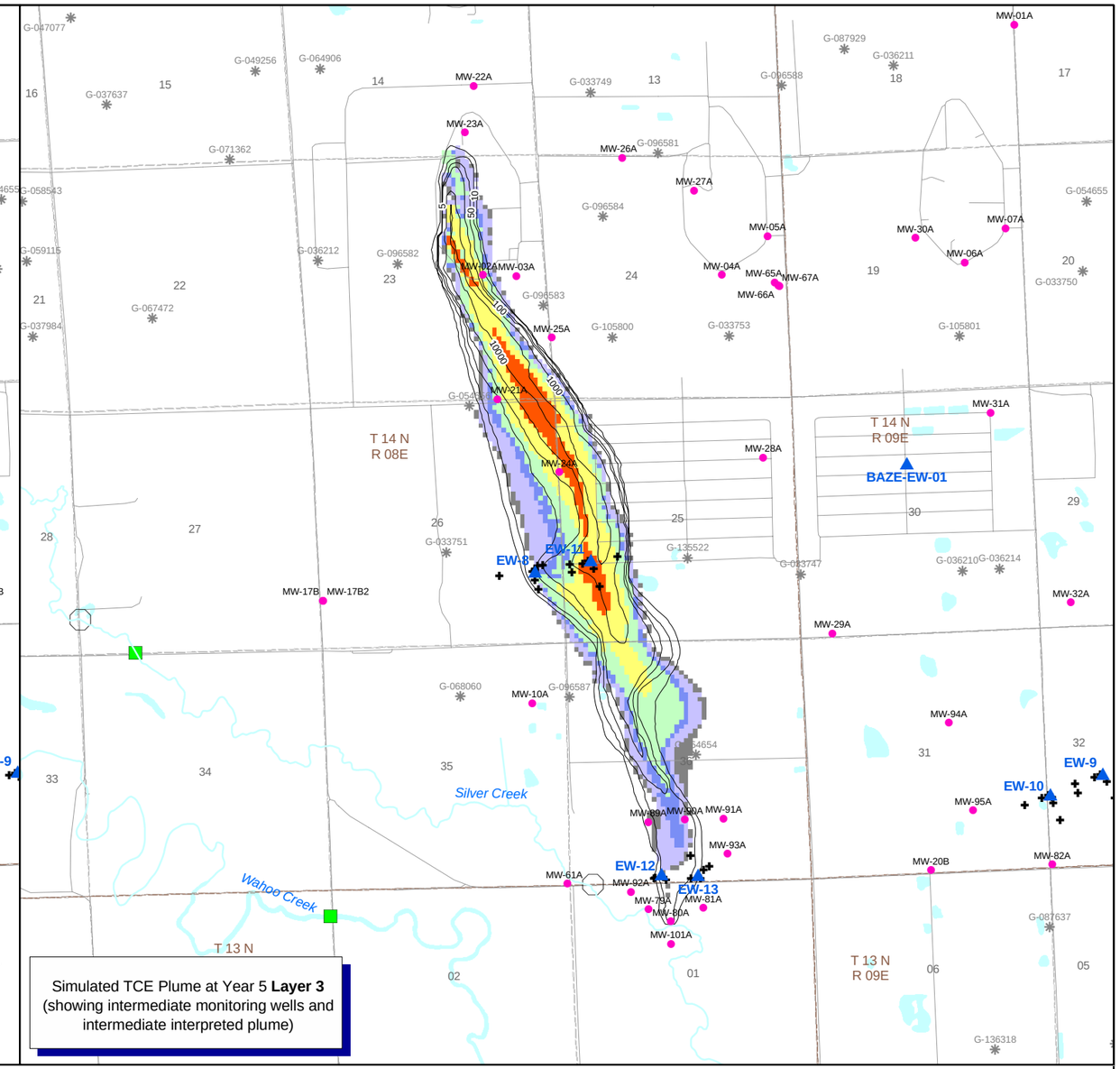
Date: May 2007

Figure Number: 6.2-6

Fig. No.:



Simulated TCE Plume at Year 5 **Layer 2** (showing shallow monitoring wells and shallow interpreted plume)



Simulated TCE Plume at Year 5 **Layer 3** (showing intermediate monitoring wells and intermediate interpreted plume)

Explanation

- USACE Extraction Well
- USACE Monitoring Well (Shallow)
- Irrigation Well
- Lower Platte North Natural Resource District Observation Well
- USACE Observation Well

Surface Water Sampling Locations

- URS Surface Water Measurement Locations
- MUD March 2005 Surface Water Measurement Locations
- USGS Stream Gauge
- TCE Plume 2006* (µg/L)

Simulated TCE Concentration (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- 100 - 1000
- 1000 - 10000
- 10000 - 40000

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 3,000 6,000 Feet

URS

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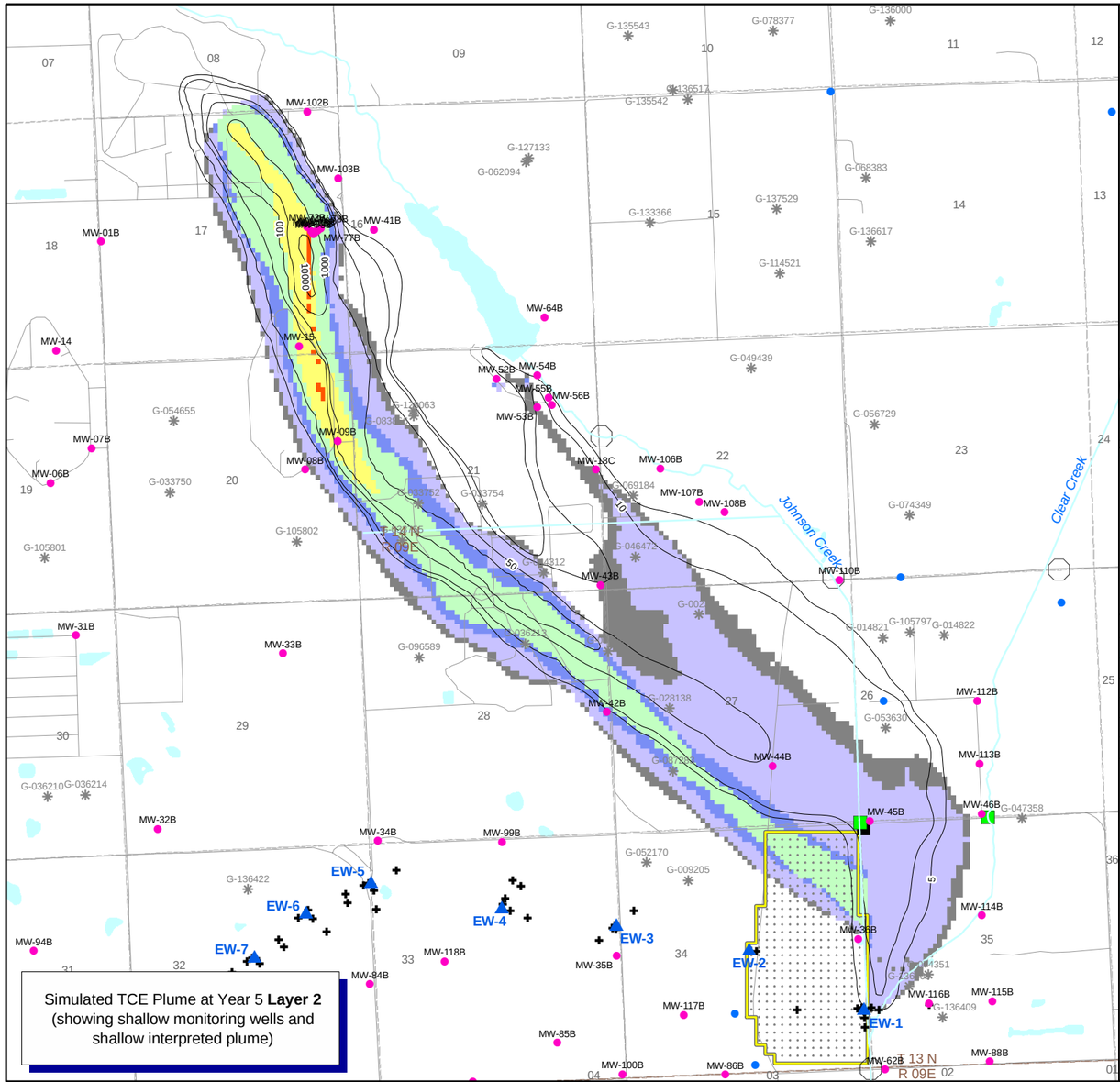
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

U.S. Army Corps of Engineers

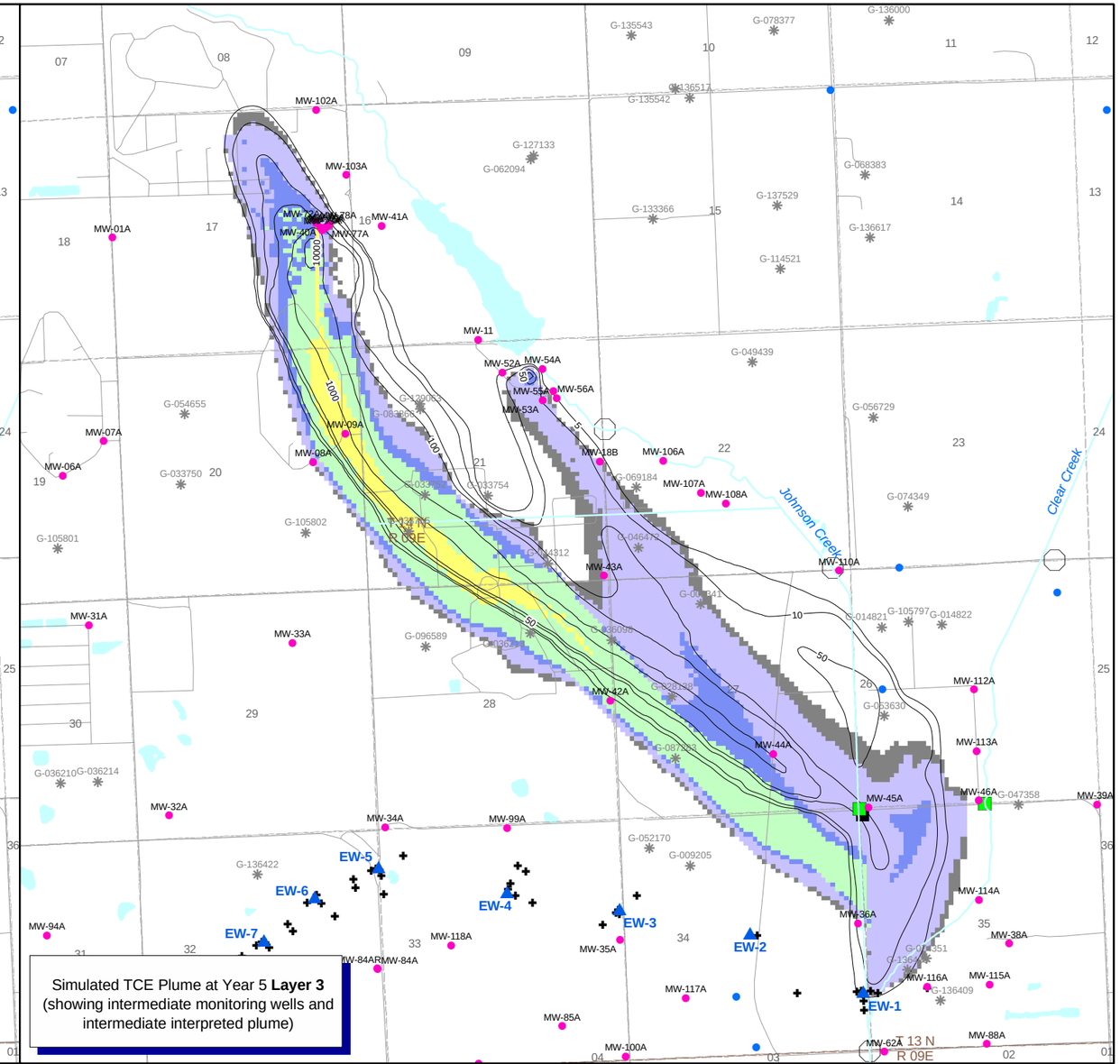
2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

Simulated LL1 TCE Plume in Recent Years

Designed by:	CMZ
Drawn by:	JLC
Checked by:	MEW
Submitted by:	LAT
Scale:	
Date:	May 2007
Fig: No.:	
Figure Number:	6.3-1



Simulated TCE Plume at Year 5 **Layer 2** (showing shallow monitoring wells and shallow interpreted plume)



Simulated TCE Plume at Year 5 **Layer 3** (showing intermediate monitoring wells and intermediate interpreted plume)

Explanation

- USACE Extraction Well
- USACE Monitoring Well (Shallow)
- Irrigation Well
- Lower Platte North Natural Resource District Observation Well
- USACE Observation Well

Surface Water Sampling Locations

- USACE Surface Water Measurement Locations
- MUD March 2005 Surface Water Measurement Locations
- USGS Stream Gauge
- Agricultural Drain
- TCE Plume 2006* (µg/L)

Simulated TCE Concentration (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- 100 - 1000
- 1000 - 10000
- 10000 - 40000

Notes:
* Plume outlines are interpretations from Figures 3-1 through 3-4. Refer to notes on those drawings for the sources of the data.

N

0 3,000 6,000 Feet

URS

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: CMZ
Drawn by: JLC
Checked by: MEW
Submitted by: LAT

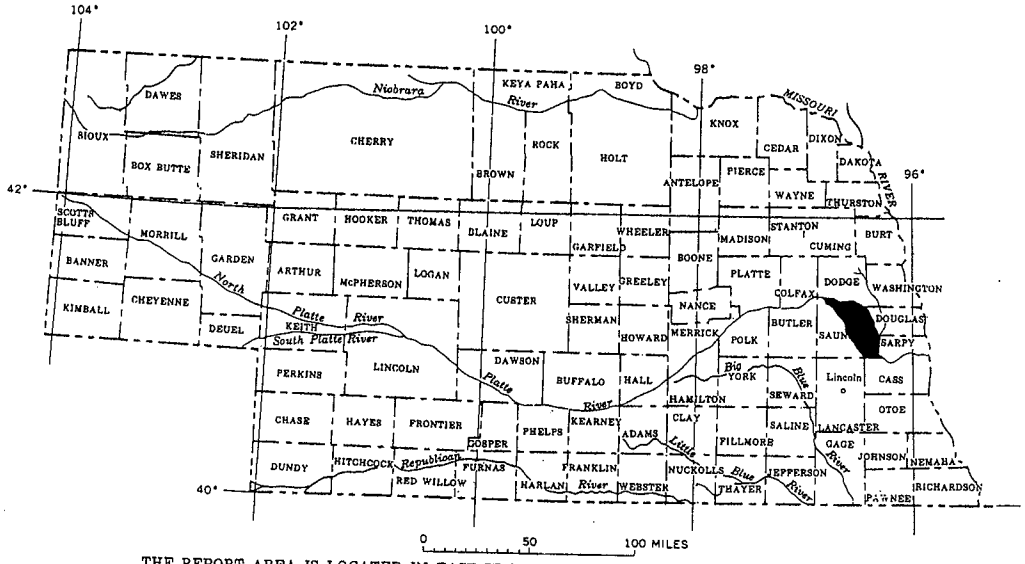
U.S. Army Corps of Engineers

2006 GROUNDWATER MODELING REPORT
OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT - MEAD, NE

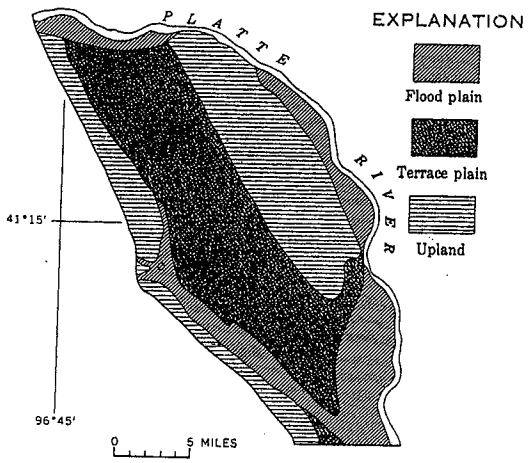
Simulated AMA TCE Plume in Recent Years

Scale:
Date: May 2007
Fig: No.:
Figure Number: **6.3-2**

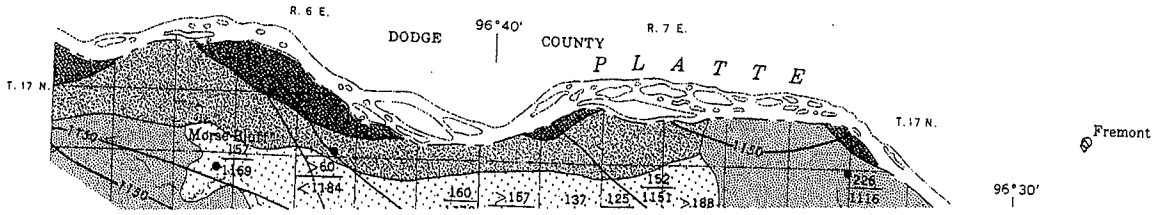
PHYSICAL SETTING AND CLIMATE



THE REPORT AREA IS LOCATED IN EAST-CENTRAL NEBRASKA, SOUTH OF THE PLATTE RIVER

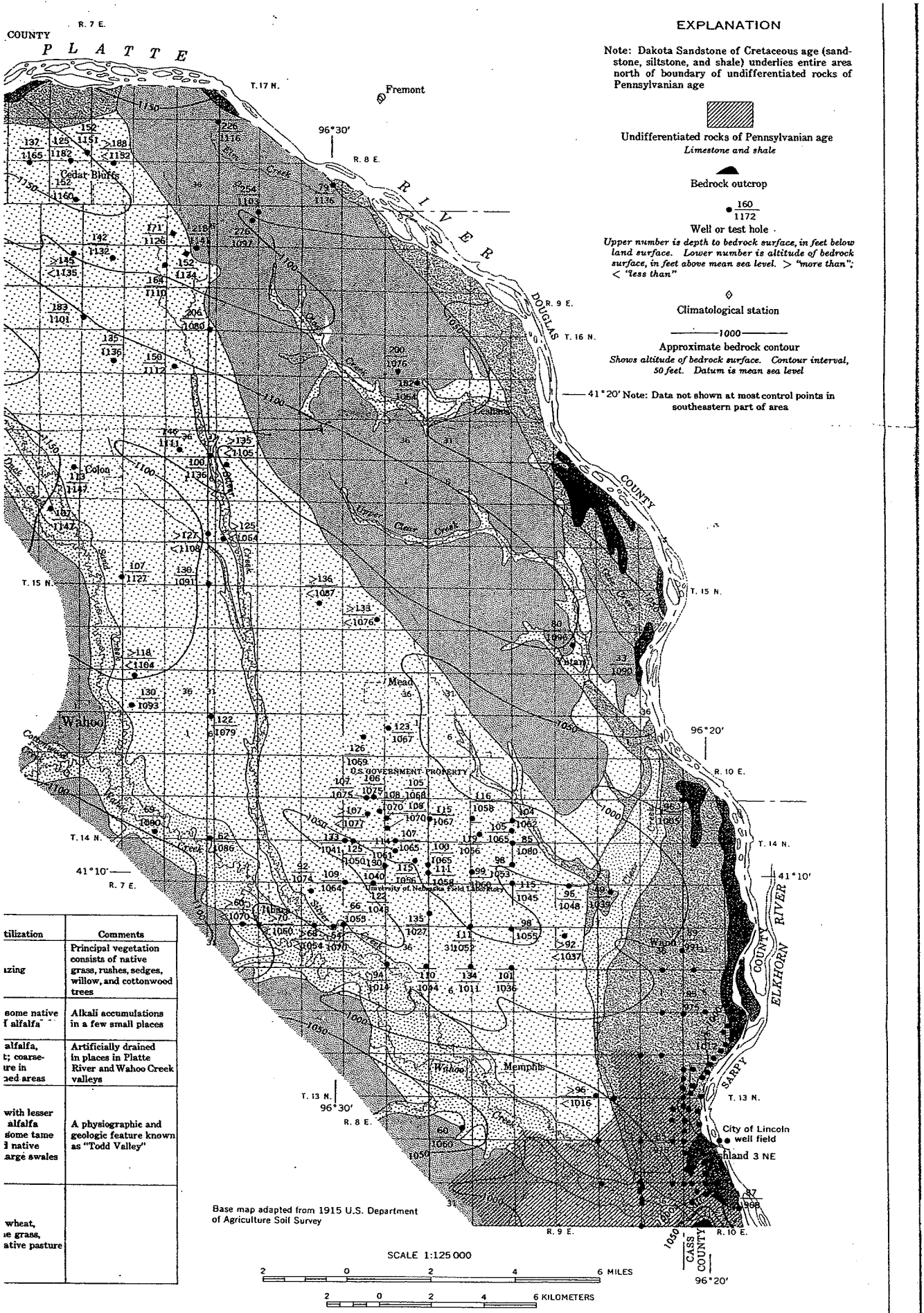


THREE PHYSIOGRAPHIC REGIONS HAVE BEEN IDENTIFIED IN EASTERN SAUNDERS COUNTY



EXPLANATION

Note: Dakota Sandstone of Cretaceous age (sandstone, siltstone, and shale) underlies entire area north of boundary of undifferentiated rocks of Pennsylvanian age



tilization	Comments
izing	Principal vegetation consists of native grass, rushes, sedges, willow, and cottonwood trees
some native f alfalfa	Alkali accumulations in a few small places
alfalfa, t; coarse- ure in ned areas	Artificially drained in places in Platte River and Wahoo Creek valleys
with lesser alfalfa some tame native arge swales	A physiographic and geologic feature known as "Todd Valley"
wheat, e grass, ative pasture	

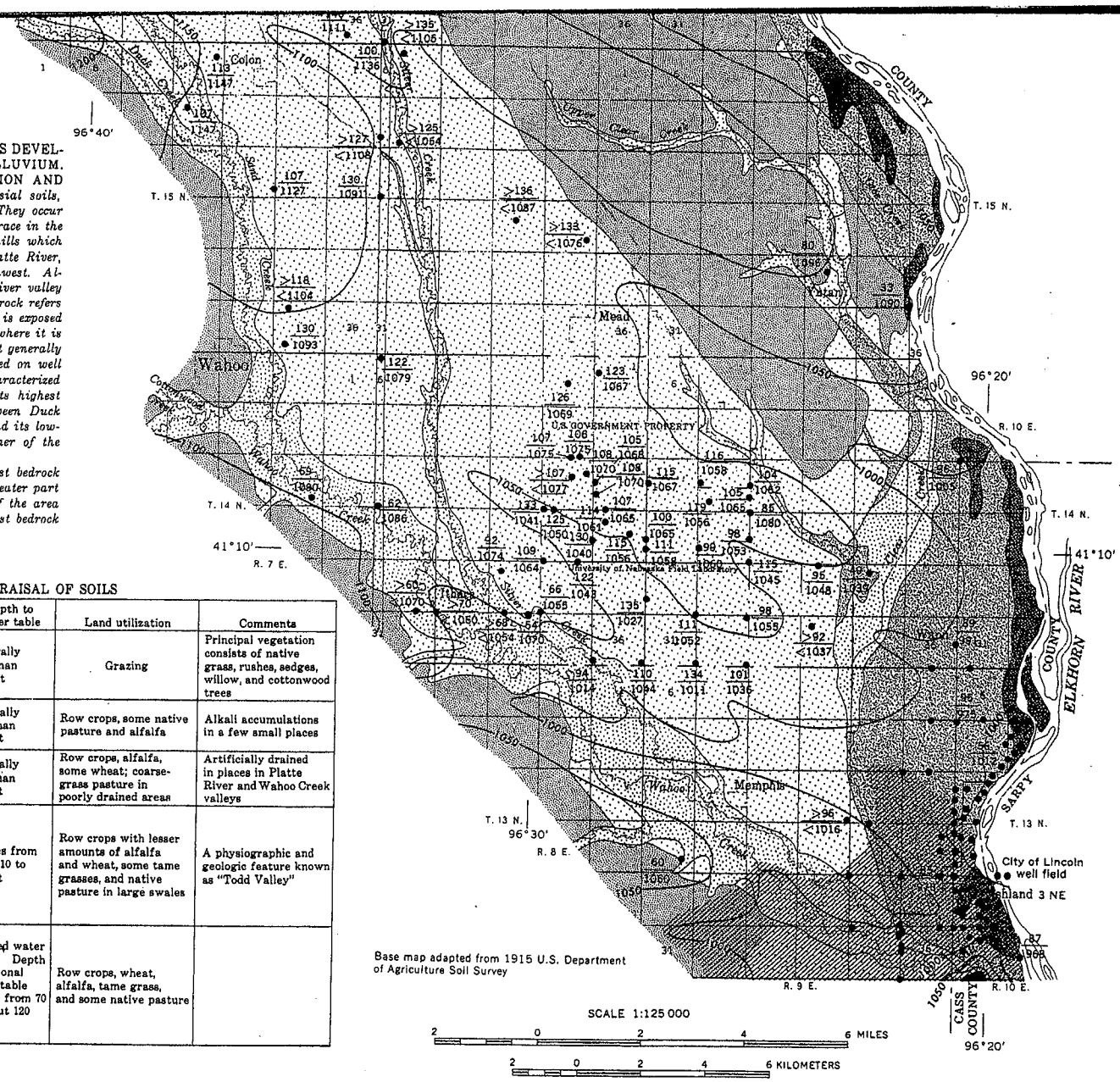
WIDE EXTREMES OF BOTH TEMPERATURE AND PRECIPITATION CHARACTERIZE THE WEATHER IN EASTERN SAUNDERS COUNTY.—*The difference between the recorded monthly minimum and maximum temperatures is slightly more than 100° F. for the winter months and averages about 75° F. for the summer months.*

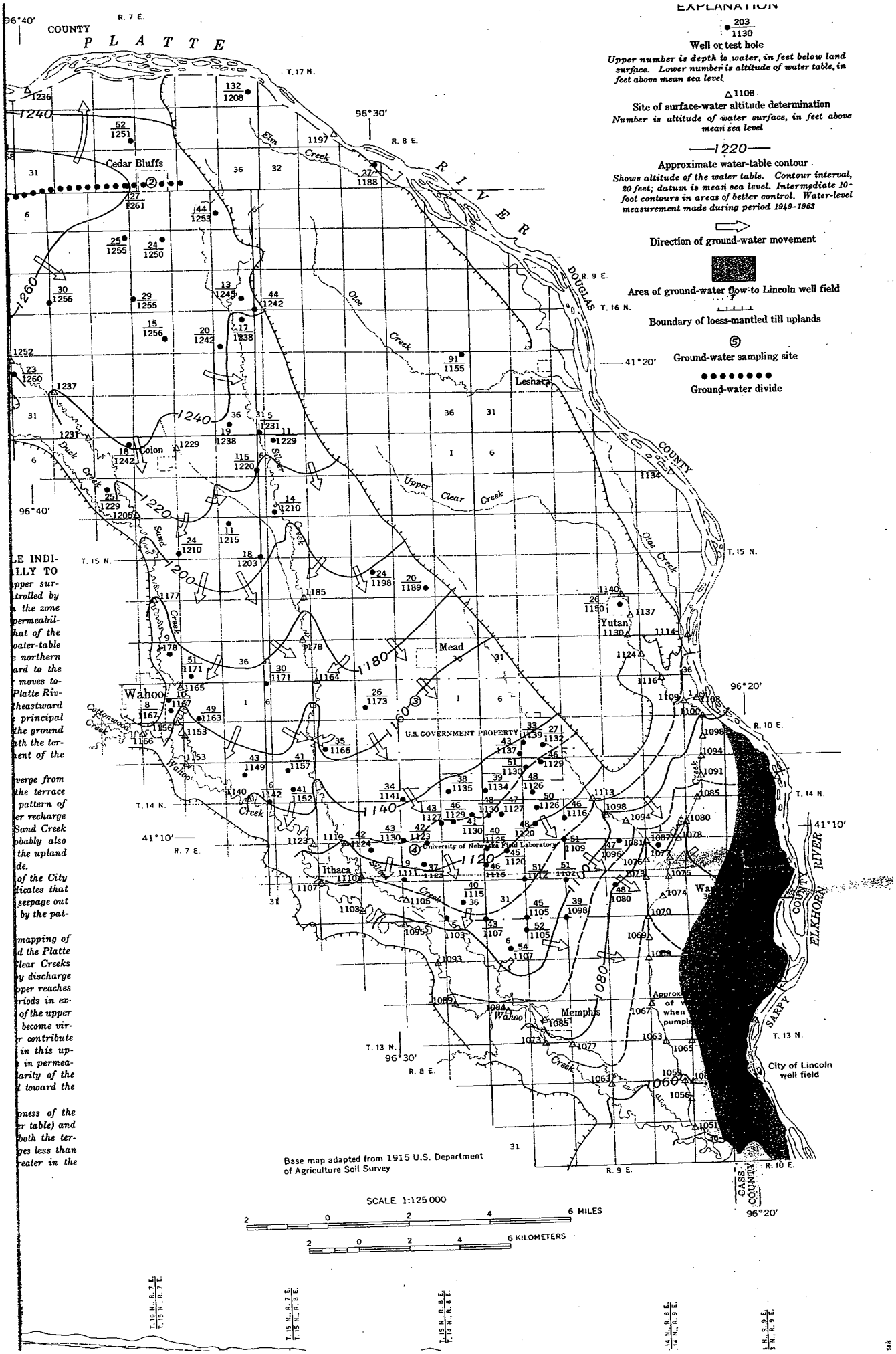
THE PARENT MATERIALS FROM WHICH THE SOILS DEVELOPED ARE LOESS (WIND-BLOWN SILT) AND ALLUVIUM. DRILLING HAS REVEALED THE CONFIGURATION AND NATURE OF THE BEDROCK SURFACE. — *Loessial soils, which are the most extensive, are silty clay loams. They occur throughout the terrace plain, on the highest stream terrace in the Platte River valley, on the loess-mantled glacial-till hills which lie between the terrace plain and the valley of the Platte River, and in the area bordering the terrace plain on the southwest. Alluvial soils are silty and sandy loams in the Platte River valley and silty clay loams in the smaller stream valleys. Bedrock refers to the consolidated rock strata that underlie the area. It is exposed in only one place (S½ sec. 31, T. 13 N., R. 10 E.); elsewhere it is buried beneath unconsolidated Quaternary deposits that generally range in thickness from 50 to 320 feet. Contours based on well and test-hole data show that the bedrock surface is characterized by east-southeastward-trending valleys and ridges. Its highest known altitude is 1,240 feet above mean sea level between Duck and Sand Creeks about 8 miles northwest of Wahoo, and its lowest known altitude is 968 feet at the southeastern corner of the area.*

Rocks of Pennsylvanian age constitute the uppermost bedrock in an area of about 16 square miles that includes the greater part of the Lincoln well field. Throughout the remainder of the area the Dakota Sandstone of Cretaceous age is the uppermost bedrock unit.

EXPLANATION AND APPRAISAL OF SOILS

Map key	Soil texture	Parent material	Terrane	Permeability	Runoff	Depth to water table	Land utilization	Comments
	Sandy loam	Alluvium	Nearly level bottom lands	High	Slow	Generally less than 10 feet	Grazing	Principal vegetation consists of native grass, rushes, sedges, willow, and cottonwood trees
	Silty and sandy loams	Alluvium	Nearly level bottom lands	Moderate to high	Slow	Generally less than 10 feet	Row crops, some native pasture and alfalfa	Alkali accumulations in a few small places
	Silty clay loam	Alluvium	Nearly level bottom lands	Low	Slow	Generally less than 10 feet	Row crops, alfalfa, some wheat; coarse-grass pasture in poorly drained areas	Artificially drained in places in Platte River and Wahoo Creek valleys
	Silty clay loam	Loess	Nearly level to hummocky terrace plain and stream terraces from 20 to 80 feet above modern flood plains	Low to moderate	Very slow to slow	Ranges from about 10 to 70 feet	Row crops with lesser amounts of alfalfa and wheat, some tame grasses, and native pasture in large swales	A physiographic and geologic feature known as "Todd Valley"
	Silty clay loam	Loess	Rolling to rough glacial till hills of the uplands, which lie from about 100 to 150 ft. above modern flood plains	Low	Rapid	Perched water tables. Depth to regional water table ranges from 70 to about 120 feet	Row crops, wheat, alfalfa, tame grass, and some native pasture	





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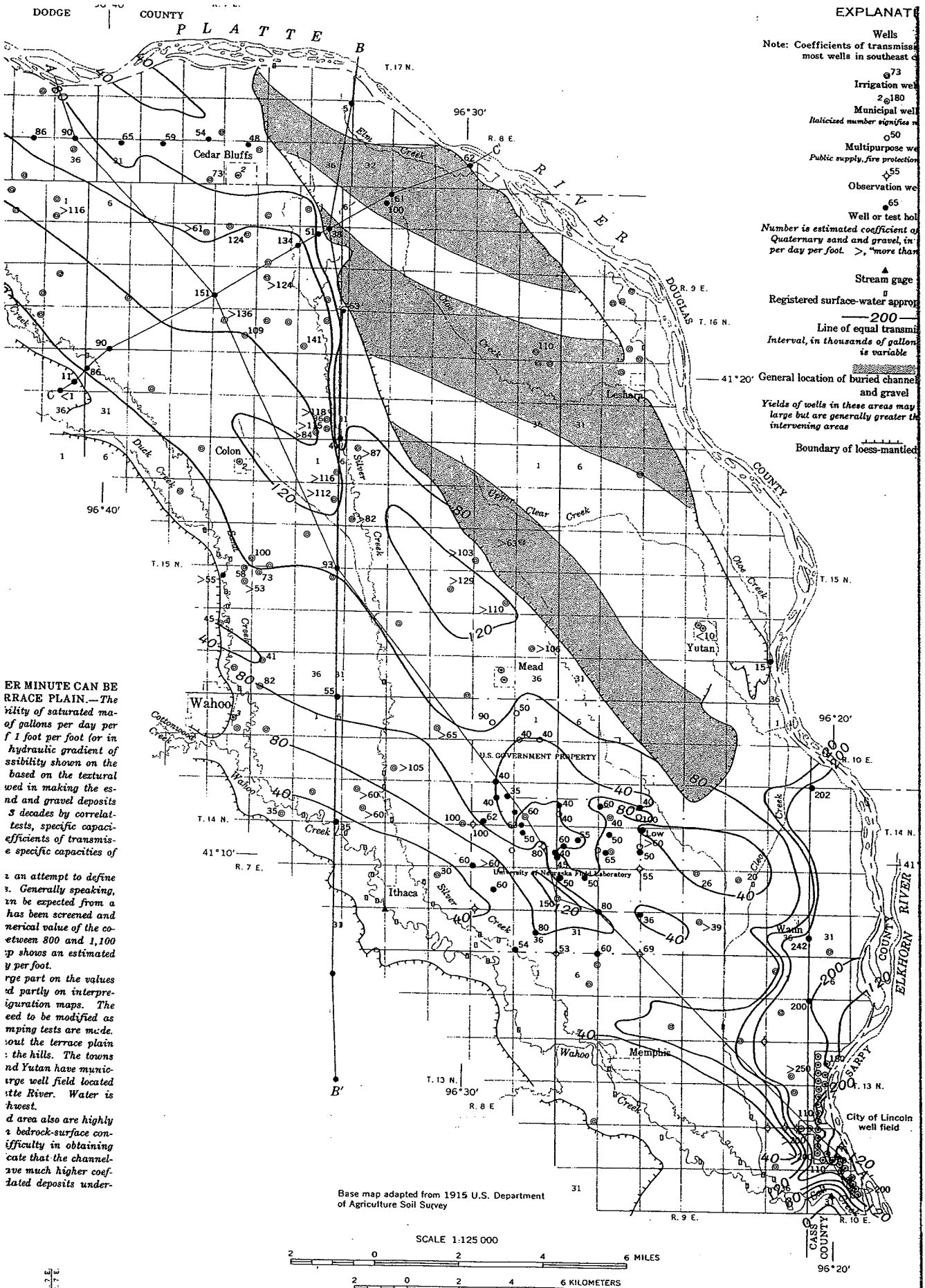

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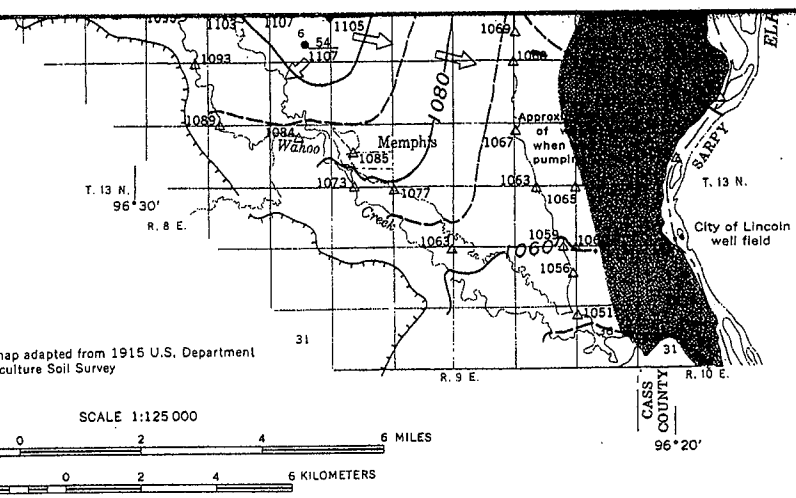
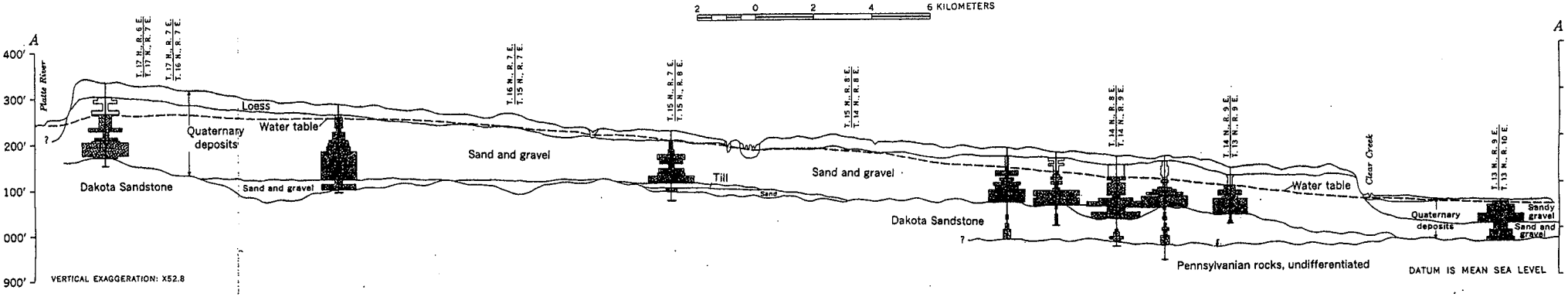
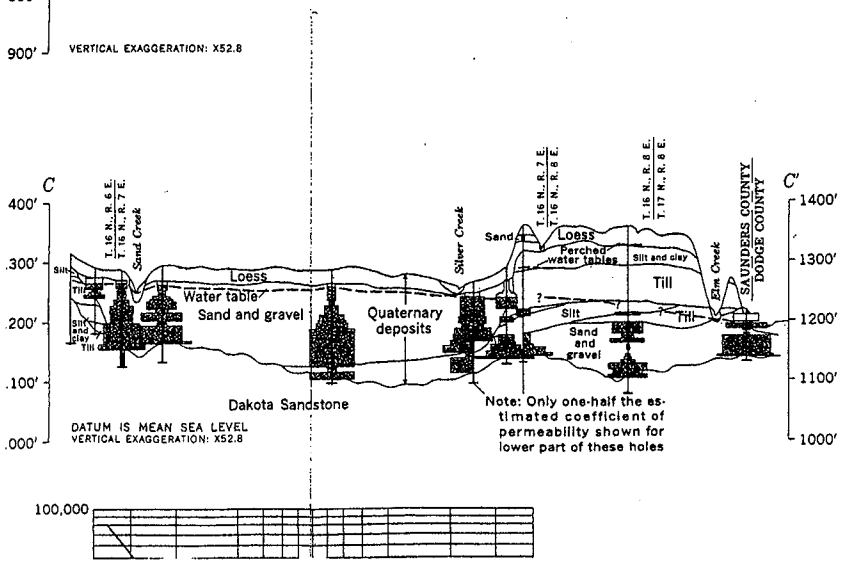
the configuration of the water table between the terrace plain and the Platte River valley. The lower reaches of Elm, Otoe, and Upper Clear Creeks flow perennially, indicating that their base flow is sustained by discharge from the regional zone of saturation. During wet years the upper reaches of these streams flow most of the time, but during rainless periods in exceptionally dry years they cease to flow. The dry-weather flow of the upper reaches is derived from perched zones of saturation which may become virtually depleted during extended rainless periods and no longer contribute to streamflow. The configuration of the regional water table in this upland area probably is very complex because of wide differences in permeability of the Quaternary deposits and because of the irregularity of the bedrock surface. The general slope, however, is northeastward toward the Platte River.

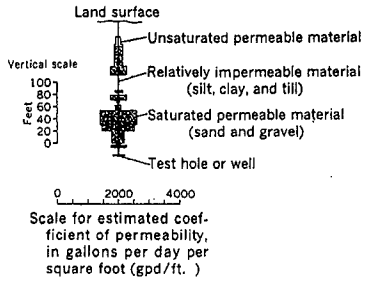
The rate of ground-water movement varies with the steepness of the hydraulic gradient (in this area, the slope of the regional water table) and the transmissibility of the water-bearing sediments. Under both the terrace plain and the Platte River valley the rate probably averages less than 1.5 feet per day, or 550 feet per year, but is considerably greater in the immediate vicinity of discharging wells.







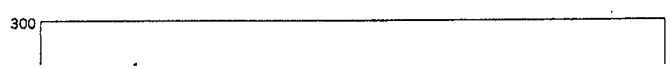
EXPLANATION



DRILLING HAS SHOWN THAT A LARGE PART OF THE AREA IS UND LAIN BY SATURATED SAND AND GRAVEL DEPOSITS.—*Most of the ter plain is underlain by about 15 to 30 feet of loess below which is about 70 to feet of sand and gravel. Much of the Platte River valley is underlain by sand gravel to a depth of about 80 feet. The upland areas are underlain by about 30 feet of loess below which are unconsolidated deposits aggregating about 15 250 feet in thickness and consisting of glacial till, silty clay, silt, and some s and gravel.*

The permeable unconsolidated deposits are saturated below the regional w table. Where the zone of saturation consists largely of moderately to highly per able sand and gravel, it is capable of transmitting large quantities of wate points of withdrawal. Most large-yield wells are screened in the lower part of sand and gravel deposits. In some parts of the upland areas deposits of sand gravel are thin or absent and large supplies of water cannot be obtained from w Locally in the upland areas thin zones of saturation are perched above the regi water table. Wells tapping such zones have small yields and are likely to go during long periods of drought.

The Dakota Sandstone, which underlies the Quaternary deposits throug most of the area, is known to contain beds that are poorly to moderately permea The full ground-water potential of the Dakota is unknown.



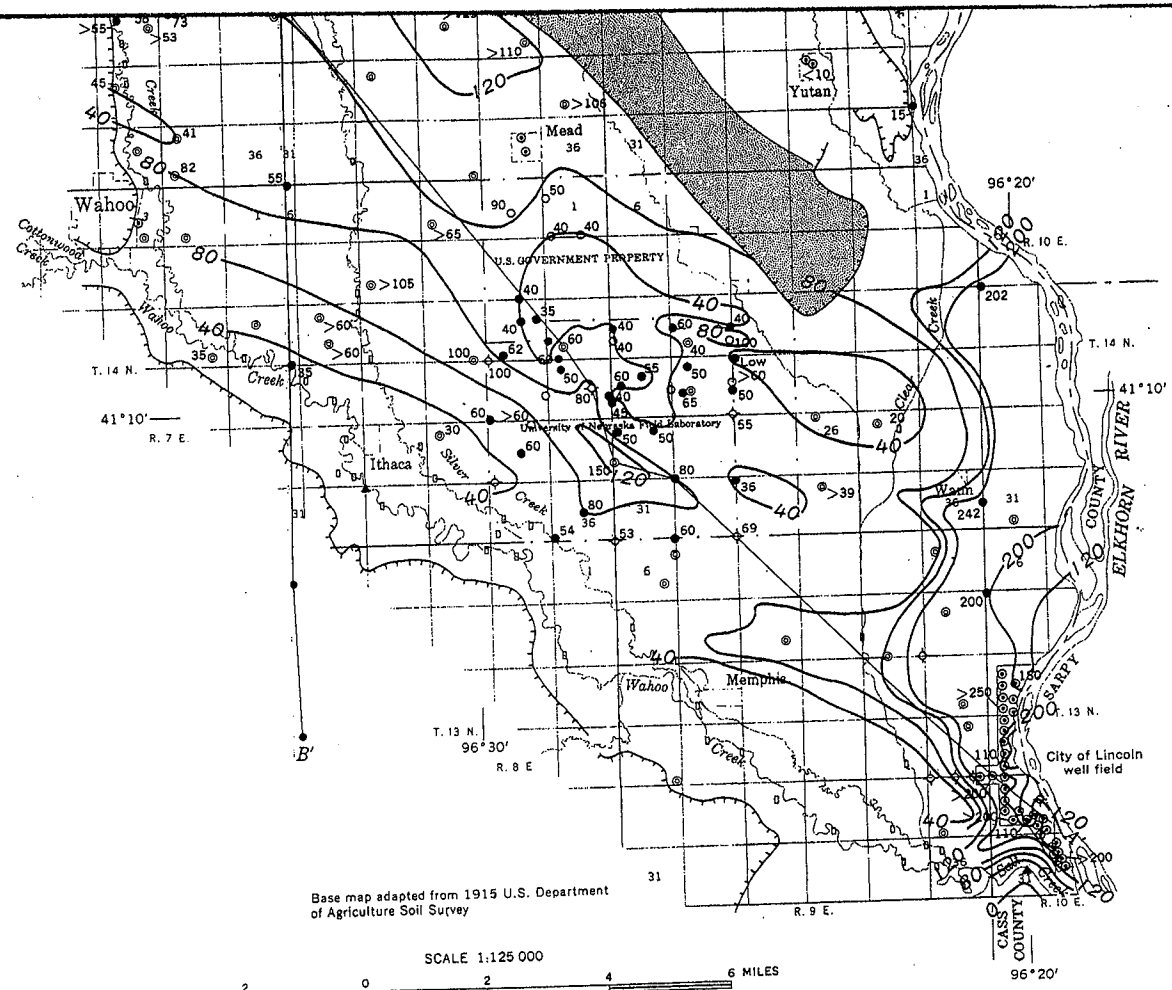
WELLS YIELDING MORE THAN 400 GALLONS PER MINUTE CAN BE LOCATED ALMOST ANYWHERE ON THE TERRACE PLAIN.—*The coefficient of transmissibility is a measure of the ability of saturated material to transmit water. It is expressed in units of gallons per day per foot of aquifer width under a hydraulic gradient of 1 foot per foot (or in gallons per day per mile of aquifer width under a hydraulic gradient of 1 foot per mile). Most of the coefficients of transmissibility shown on the map at the individual control points are estimates based on the textural composition of test-hole samples. The method followed in making the estimates has been widely used for unconsolidated sand and gravel deposits in Nebraska and has been verified over a period of 3 decades by correlating the results with laboratory analyses, pumping tests, specific capacities of wells, and well yields. The few remaining coefficients of transmissibility are estimates based on drillers' logs and the specific capacities of large-yield wells.*

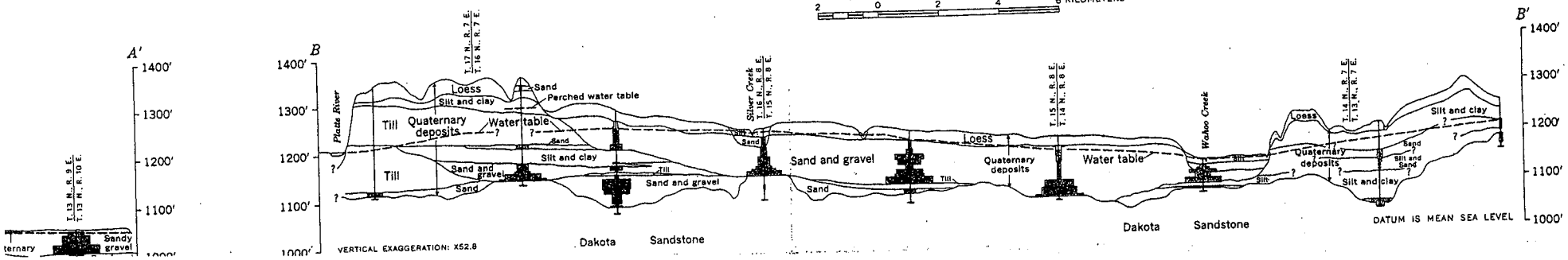
The lines of equal transmissibility were drawn in an attempt to define areas of different capacities for yielding water to wells. Generally speaking, the maximum yield, in gallons per minute, that can be expected from a well that taps the full thickness of the aquifer and has been screened and developed properly is from 1/70 to 1/100 of the numerical value of the coefficient of transmissibility; thus, a well yielding between 800 and 1,100 gallons per minute might be developed where the map shows an estimated coefficient of transmissibility of 80,000 gallons per day per foot.

The lines of equal transmissibility are based in large part on the values shown at the individual control points but are based partly on interpretations of the bedrock-surface and water-table configuration maps. The lines are highly generalized and undoubtedly will need to be modified as new test holes are drilled, wells are installed, and pumping tests are made.

Large-yield irrigation wells are scattered throughout the terrace plain and the alluvial valleys, but only a few are located in the hills. The towns of Morse Bluff, Cedar Bluffs, Colon, Wahoo, Mead, and Yutan have municipal-supply wells, and the City of Lincoln has a large well field located in the southeast corner of the county near the Platte River. Water is transported by pipeline to Lincoln, 30 miles to the southwest.

The boundaries of the buried channels in the upland area also are highly generalized and were determined mostly from data on bedrock-surface configuration and from local reports on the ease or difficulty in obtaining domestic water supplies. The few data available indicate that the channel-fill deposits consist partly of sand and gravel and have much higher coefficients of transmissibility than do other unconsolidated deposits underlying the upland area.





SUMMARY

The sand and gravel deposits of Quaternary age constitute the most important ground-water reservoir and are the source of nearly all the water pumped from wells in the area. An estimated 3.5 million acre-feet of good quality water is stored in these deposits and an additional 1.5 million acre-feet is stored in the underlying Dakota Sandstone. Even larger quantities are stored at greater depths in the Paleozoic dolomites and sandstones, but the water is of poorer quality.

Pumpage for irrigation since 1956 is estimated to have ranged from about 2,500 acre-feet (1962) to about 6,000 acre-feet (1957). The town of Wahoo annually pumps about 460 acre-feet, and other towns pump an estimated total of 180 acre-feet. In 1963 the City of Lincoln pumped 27,000 acre-feet from its well field alongside the Platte River in the southeast corner of the area; since then pumpage has increased and probably is likely to continue to do so. Pumping at Lincoln city well field induces recharge from Platte River.

The quantity of ground water pumped to date is very small compared to the amount of water stored in the rocks. Furthermore, most of the ground water withdrawn has been replaced by infiltrating precipitation and by influent seepage from the Platte River. The large quantity of ground water in storage in addition to the flow of the Platte River indicates that the water resources of the area, if managed properly, can be developed much more extensively without appreciably depleting the supply.

ROCK UNITS AND THEIR WATER-BEARING CHARACTERISTICS

Unit	Approximate depth to top of unit (feet below land surface)	Approximate thickness (feet)	Physical description and areal distribution	Water availability and quality
Quaternary deposits	At the surface	0–320	Widespread soils; floodplain deposits of clay, silt, sand, and gravel; wind-deposited clay and silt; stream-laid sand and gravel; glacial drift, mostly clay and silt. Underlies entire area except for one place in southeast corner.	Surficial deposits influence runoff and recharge to ground water and largely determine use of land. Sands and gravels are principal source of water to wells in area; yields range from small to 1,500 gpm. Water generally contains less than 500 ppm total dissolved solids and is hard to very hard; locally may contain up to 700 ppm total dissolved solids.
Dakota Sandstone	0–320	0–490	Sandstone, siltstone, claystone, and shale; about half of unit is poorly to well cemented sandstone. Underlies all but southeastern part of area and crops out in one place in southeast corner of area.	Important secondary source of ground water and can be utilized in conjunction with the overlying unit to increase yields of wells; is source of water for town of Yutan and part of the source for two irrigation wells. Quality of water inadequately determined but probably similar to that in Quaternary deposits except in northwestern part of area.
Pennsylvanian rocks, undifferentiated	0–600	260–600	Interbedded marine limestones and shales. Underlie entire area and crop out in one place in southeast corner of area.	Not used as a source of water supply in the area; important as a barrier to the movement of ground water.
Paleozoic upper dolomites	390–950	750–950	Thick dolomites having differing porosities, some limestones and shales. Underlie entire area.	Not used as a source of water supply in the area, but large amounts of water are available. Quality of water unknown.
St. Peter Sandstone	1,100–1,900	25–60	Well sorted, poorly cemented, quartz sandstone. Underlies entire area.	Not used as a source of water supply in the area, but small to large amounts of water are available. One analysis and electric logs of oil tests indicate total dissolved solids probably range from about 1,400 ppm to more than 5,000 ppm.
Paleozoic lower dolomites	1,300–1,950	0–250	Dolomites having differing porosities, some limestones and shales. Underlie all but southeastern part of area.	Not used as a source of water supply in the area, but small to large amounts of water are probably available. Quality of water probably similar to that of water in overlying and underlying units.
Paleozoic basal sand	1,300–2,180	0–50	Well sorted, poorly cemented, quartz sandstone. Underlies all but southeastern part of the area.	Not used as a source of a water supply in the area, but small to moderate amounts of water are available. One analysis and electric logs of oil tests indicate that total dissolved solids may range from about 1,500 ppm to more than 5,000 ppm.
Precambrian rocks	1,150–2,200	Basement rocks	Diabase and metasediments. Underlie entire area.	Not a source of water supply in the area.

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