APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

SACRAMENTO, CALIFORNIA

Prepared for:

AEROJET
A GenCorp Company

Prepared by:

Central Valley Environmental, Inc.
9718 Fair Oaks Blvd., Suite C
Fair Oaks, CA 95628

With assistance from:

Aerojet-General Corporation
Aerojet Environmental Restoration Department
P.O. Box 13222
Sacramento, CA 95813-6000

August 1, 2005

APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

Table of Contents

H1.0 INTRODUCTION 1

H1.1 PURPOSE AND OBJECTIVES 1
H1.2 ORGANIZATION 2

H2.0 ZONE 1 GROUNDWATER FLOW SIMULATIONS 3

H2.1 ZONE 1 MODEL BACKGROUND AND DEVELOPMENT 3
H2.2 ZONE 1 EXISTING SYSTEM HYDRAULIC CONTAINMENT 6
H2.3 REMEDIAL ALTERNATIVE Z1-2 – HYDRAULIC CONTAINMENT NEAR THE DOWNGRADIENT EXTENT OF COPCS 7
H2.4 REMEDIAL ALTERNATIVE Z1-3 - HYDRAULIC CONTAINMENT WITH INTERIOR WELL OPERATION 8
H2.5 ZONE 1 SUMMARY 9

H3.0 ZONE 2 GROUNDWATER FLOW SIMULATIONS 10

H3.1 ZONE 2 MODEL BACKGROUND AND DEVELOPMENT 10
H3.2 REMEDIAL ALTERNATIVE Z2-2 - HYDRAULIC CONTAINMENT SOUTH OF WHITE ROCK ROAD .. 11
H3.3 REMEDIAL ALTERNATIVE Z2-3 - HYDRAULIC CONTAINMENT SOUTH OF WHITE ROCK ROAD WITH "MASS REMOVAL" WELL 12
H3.4 ZONE 2 SUMMARY 12

H4.0 ZONE 3 GROUNDWATER FLOW SIMULATIONS 13

H4.1 ZONE 3 MODEL BACKGROUND AND DEVELOPMENT 13
H4.2 ZONE 3 EXISTING SYSTEM HYDRAULIC CONTAINMENT 14
H4.3 REMEDIAL ALTERNATIVE Z3-2 – HYDRAULIC CONTAINMENT NEAR THE DOWNGRADIENT EXTENT OF COPCS 15
H4.4 REMEDIAL ALTERNATIVE Z3-3 – HYDRAULIC CONTAINMENT WITH INTERIOR WELL OPERATION 15
H4.5 ZONE 3 SUMMARY 16

H5.0 ZONE 4 GROUNDWATER FLOW SIMULATIONS 17

H5.1 ZONE 4 MODEL BACKGROUND AND DEVELOPMENT 17
H5.2 ZONE 4 EXISTING SYSTEM HYDRAULIC CONTAINMENT 18
H5.3 REMEDIAL ALTERNATIVE Z4-2 – HYDRAULIC CONTAINMENT NEAR THE DOWNGRADIENT EXTENT OF COPCS 19
H5.4 REMEDIAL ALTERNATIVE Z4-3 – HYDRAULIC CONTAINMENT WITH INTERIOR WELL OPERATION 20
H5.5 ZONE 4 SUMMARY 20

H6.0 REFERENCES CITED 22

APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

List of Figures

Figure H1-1: Site Location Map

Figure H2-1: Zone 1 – Model Grid Boundary and Refined Model Area

Figure H2-2: Zone 1 – Model Layer B Hydraulic Conductivity Distribution

Figure H2-3: Zone 1 – Model Layer C Hydraulic Conductivity Distribution

Figure H2-4: Zone 1 – Model Layer D Hydraulic Conductivity Distribution

Figure H2-5: Zone 1 – Model Layer E Hydraulic Conductivity Distribution

Figure H2-6: Zone 1 – Model Layer F Hydraulic Conductivity Distribution

Figure H2-7: Zone 1 – Existing Operation Model Layer C Area of Hydraulic Containment

Figure H2-8: Zone 1 – Existing Operation Model Layer D Area of Hydraulic Containment

Figure H2-9: Zone 1 – Existing Operation Model Layer E Area of Hydraulic Containment

Figure H2-10: Zone 1 – Estimated Travel Times for Existing Operation and Remedial Alternatives Z1-2 and Z1-3

Figure H2-11: Zone 1 – Alternative Z1-2 Model Layer C Area of Hydraulic Containment

Figure H2-12: Zone 1 – Alternative Z1-2 Model Layer D Area of Hydraulic Containment

Figure H2-13: Zone 1 – Alternative Z1-2 Model Layer E Area of Hydraulic Containment

Figure H2-14: Zone 1 – Alternative Z1-3 Model Layer C Area of Hydraulic Containment

Figure H2-15: Zone 1 – Alternative Z1-3 Model Layer D Area of Hydraulic Containment

Figure H2-16: Zone 1 – Alternative Z1-3 Model Layer E Area of Hydraulic Containment

Figure H3-1: Zone 2 – Layer B Alternative Z2-2 Hydraulic Containment with Aquifer Restoration

APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

List of Figures (continued)

Figure H3-2: Zone 2 – Layer C Alternative Z2-2 Hydraulic Containment with Aquifer Restoration

Figure H3-3: Zone 2 – Layer B Alternative Z2-3 Hydraulic Containment with Aquifer Restoration

Figure H3-4: Zone 2 – Layer C Alternative Z2-3 Hydraulic Containment with Aquifer Restoration

Figure H3-5: Zone 2 – Alternative Z2-2 – Estimated Travel Times and Flow Paths

Figure H4-1: Zone 3 – Subregional Model Delineation

Figure H4-2: Zone 3 – Subregional Model Grid

Figure H4-3: Zone 3 – Layer B Modeled Existing Hydraulic Containment

Figure H4-4: Zone 3 – Layer C Modeled Existing Hydraulic Containment

Figure H4-5: Zone 3 – Layer D Modeled Existing Hydraulic Containment

Figure H4-6: Zone 3 – Layer B Modeled Alternative Z3-2 - Hydraulic Containment

Figure H4-7: Zone 3 – Layer C Modeled Alternative Z3-2 - Hydraulic Containment

Figure H4-8: Zone 3 – Layer D Modeled Alternative Z3-2 - Hydraulic Containment

Figure H4-9: Zone 3 – Layer E Modeled Alternative Z3-2 - Hydraulic Containment

Figure H4-10: Zone 3 – Layer F Modeled Alternative Z3-2 - Hydraulic Containment

Figure H4-11: Zone 3 – Layer B Modeled Alternative Z3-3 - Hydraulic Containment

Figure H4-12: Zone 3 – Layer C Modeled Alternative Z3-3 - Hydraulic Containment

Figure H4-13: Zone 3 – Layer D Modeled Alternative Z3-3 - Hydraulic Containment

Figure H4-14: Zone 3 – Layer E Modeled Alternative Z3-3 - Hydraulic Containment

Figure H4-15: Zone 3 – Layer F Modeled Alternative Z3-3 - Hydraulic Containment

APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

List of Figures (continued)

Figure H5-1: Zone 4 - Model Grid Boundary and Calibration Target Locations

Figure H5-2: Zone 4 - Model Layer A Hydraulic Conductivity Distribution

Figure H5-3: Zone 4 - Model Layer B Hydraulic Conductivity Distribution

Figure H5-4: Zone 4 - Layer A Modeled Existing Hydraulic Containment

Figure H5-5: Zone 4 - Estimated Travel Times and Paths

Figure H5-6: Zone 4 – Layers A Modeled Alternative Z4-2 – Hydraulic Containment with Aquifer Restoration

Figure H5-7: Zone 4 – Layers B Modeled Alternative Z4-2 – Hydraulic Containment with Aquifer Restoration

Figure H5-8: Zone 4 - Layers A Modeled Alternative Z4-3 – Hydraulic Containment with Aquifer Restoration

Figure H5-9: Zone 4 - Layers B Modeled Alternative Z4-3 – Hydraulic Containment with Aquifer Restoration

APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

List of Tables

Table H2-1: Zone 1 – Summary of Calibration Statistics

Table H2-2: Zone 1 – Extraction and Recharge Well Status and Pumping Rates During Groundwater Model Simulations

Table H3-1: Zone 2 – Alternatives Z2-2 and Z2-3, Proposed Extraction Wells and Estimated Pumping Rates

Table H4-1: Zone 3 - Extraction Wells and Pumping Rates Under Existing Conditions

Table H4-2: Zone 3 – Alternative Z3-2, Existing and Proposed Extraction Wells and Estimated Pumping Rates, and Estimated Travel Times

Table H4-3: Zone 3 – Alternative Z3-3, Existing and Proposed Extraction Wells and Estimated Pumping Rates, and Estimated Travel Times

Table H5-1: Zone 4 - Summary of Groundwater Model Calibration Data – Layers A and B; Calibration Targets, Water Levels, Residuals, and Statistics

Table H5-2: Zone 4 - Extraction Well Status and Pumping Rates During Groundwater Model Simulations

Table H-A: Summary of Zone 1 Calibration Statistics

APPENDIX H

GROUNDWATER FLOW SIMULATIONS CONDUCTED IN SUPPORT OF THE PERIMETER GROUNDWATER OPERABLE UNIT FEASIBILITY STUDY

AEROJET-GENERAL SUPERFUND SITE

H1.0 INTRODUCTION

This Appendix presents the results of groundwater flow simulations performed to support the Perimeter Groundwater Operable Unit (PGOU) Feasibility Study (FS) prepared for the Aerojet-General Superfund Site (Site), located in Sacramento, California. The PGOU addresses chemicals of potential concern (CoPCs) in groundwater at or beyond the Aerojet property boundaries, except for the western boundaries that were addressed by the Western Groundwater Operable Unit (WGOU). The Site was previously divided into four management zones (Zones 1 to 4) as shown on Figure H1-1. Separate groundwater flow models were developed for each zone to reflect the hydrologic characteristics and different groundwater flow directions in each zone.

H1.1 Purpose and Objectives

This Appendix documents the results of groundwater flow simulations conducted to assess and compare potential remedial alternatives developed for each Zone. Summaries of the background and development of the models used in each Zone are also included. The modeling results provide a relative comparison for the evaluation of remedial alternatives presented in the PGOU FS. Remedial alternatives were evaluated based on the model-predicted hydraulic containment, groundwater flow paths, and travel times for existing or proposed groundwater extraction and treatment (GET) systems in Zones 1 through 4.

The primary objectives of the groundwater flow simulations were to assess the hydraulic containment provided by existing GET systems in Zones 1, 3, and 4, and to assess any new or additional extraction well locations and pumping rates estimated to meet hydraulic containment and aquifer restoration remedial action objectives in Zones 1 through 4.

The groundwater flow models developed for Zones 1 and 3 were “nested” within the “Regional Model” initially developed during the Western Groundwater Operable Unit Remedial Investigation/Feasibility Study (Aerojet et. al., 2000), including recent updates and modifications (Aerojet et. al., 2004). A version of the Regional Model was used to conduct the groundwater modeling in Zone 2, and a new groundwater flow model was created for Zone 4.

The level of detail in each groundwater flow model is reflective of the effort necessary to meet the objectives of the PGOU FS. Specifically, the groundwater modeling results are intended to provide data used for cost estimating within the plus 50 to minus 30 percent range specified in EPA guidance (EPA, 1988). As such, the number of extraction wells, and the pumping rates estimated to achieve hydraulic containment, may vary within these ranges.

H1.2 Organization

This Appendix is organized into the following sections describing the groundwater flow model construction and remedial alternatives development for each management zone within the PGOU:

Section 1 describes the organization and purpose of this Appendix;

Section 2 describes the existing hydraulic containment in Zone 1 and the development of Remedial Alternatives Z1-2 and Z1-3;

Section 3 describes Remedial Alternatives Z2-2 and Z2-3 developed for Zone 2;

Section 4 describes the existing hydraulic containment and the development of Remedial Alternatives Z3-2 and Z3-3 for Zone 3;

Section 5 describes the existing hydraulic containment and the development of Remedial Alternatives Z4-2 and Z4-3 for Zone 4, and;

Section 6 presents the references cited in this Appendix.

H2.0 ZONE 1 GROUNDWATER FLOW SIMULATIONS

This section describes the groundwater flow model developed for Zone 1, and the results of hydraulic simulations performed to assess existing hydraulic containment and potential future hydraulic containment under Remedial Alternatives Z1-2 and Z1-3. The modeling simulations conducted for these evaluations were designed to show the following:

- The estimated hydraulic containment of the existing American River groundwater extraction and treatment [(AR) ARGET]and GET D systems;
- For Remedial Alternatives Z1-2, the locations and pumping rates of extraction wells necessary to achieve hydraulic containment near the downgradient extents of CoPCs;
- For Remedial Alternative Z1-3, the locations and pumping rates of extraction wells necessary to achieve hydraulic containment near the downgradient extents of CoPCs and the estimated effects from operating mass removal wells, and;
- Estimated travel times from apparent source areas to downgradient extraction wells.

The area of groundwater hydraulically contained in these simulations was estimated using particle tracking endpoint analysis. The particle travel times were estimated using particle tracking path-line analyses. The following sections describe the model background and development, the hydraulic containment of the existing ARGET and GET D systems, and the development and analysis of Remedial Alternatives Z1-2 and Z1-3.

H2.1 Zone 1 Model Background and Development

A transient three-dimensional groundwater flow model was created to simulate groundwater flow conditions in Zone 1. The groundwater flow model is based on the U.S. Geological Survey (USGS) finite difference MODFLOWT code (McDonald and Harbaugh, 1988). GWVISTAS (Environmental Simulations, Inc., 1996) was used as both a pre-processor and post-processor in the modification of the flow model. The Zone 1 Model is a nested model embedded within the Regional Model. The area of the Zone 1 Model relative to the Regional Model is shown on Figure H2-1.

The Zone 1 Model addresses an area of approximately 11.5 square miles. The model domain is represented by a grid that was refined from the Regional Model grid to provide higher resolution for evaluating hydraulic containment in the areas of interest. The grid contains 57 rows and 90 columns of model cells that represent 250 x 250-foot areas.

The model grid is divided laterally and vertically into eight model layers that correspond to Hydrostratigraphic Layers (Layers) B, C, D, E, and F. The layer thickness and structure are based on five cross sections presented in the Draft PGOU RI Report (Aerojet, et. al., 2003) (Figures 3-2, -3, -4, –5, and -6), and modified in the Final RI Report. Layer B is model layer 1, and model layers 2, 4, 6, and 8 correspond to Layers C, D, E, and F, respectively. Layer B is relatively thin (<20 feet thick) in western Zone 1, and is dry or absent in the eastern portions of Zone 1. In addition, the aquitard between Layers B and C is thin or absent where Layer B is saturated. Consequently, in areas where Layer B is saturated and where Layer C is hydraulically contained, Layer B is also contained. Odd numbered model layers 3, 5, and 7 represent the relatively lower permeability silts and/or clay between Layers C and D, D and E, and E and F, respectively.

Approximately 50 monitor wells were used to pick the tops and bottoms of each layer, and the layer surfaces were contoured using Surfer® software. Some of the layer surfaces were edited where the top or bottom of layers crossed and there were insufficient data to adequately contour the layer surface. Model layer one behaves as unconfined at the beginning of the model simulations. Model layers 2, 4, 6, and 8 behave as confined.

The transient boundary conditions for the Zone 1 Model were imported from the Regional Model as constant head cells for each corresponding layer. The water levels along the Zone 1 Model boundary correspond to water levels in the Regional Model over modeled periods between 1956 and 2002. The Telescopic Mesh Refinement (TMR) tool in Groundwater Vistas was used to acquire the head values for each cell. TMR creates a refined model grid within a sub-region of the Regional Model.

The American River recharge and discharge is included in the Zone 1 Model. The American River is modeled to be neither gaining nor losing beneath Lake Natoma and over a distance of approximately 2,800 feet below (west) Nimbus Dam. Model calibration suggests that the river is a losing stream further to the south, and river discharge is included in the Zone 1 Model. Differences in the locations of river discharge in the Regional and Zone 1 Models appear to be attributable to the more detailed definition of the model layers in the Zone 1 Model.

Groundwater extraction by the ARGET and GET D extraction wells and groundwater recharge from the GET D recharge wells is averaged across the layer(s) that each well is screened in.

Hydraulic parameters in the model include hydraulic conductivity, storage/specific yield, effective porosity, and recharge. The initial values assigned for these parameters in the Zone 1 Model were imported from the Regional Model, and are based on the distribution of relatively permeable and impermeable sediments. Figures H2-2 through H2-6 show the horizontal hydraulic conductivities in Layers B through F, respectively. Conductivity values for Layer B ranged from 2.25 ft/day to 125 ft/day. In Layer C, values ranged from 2.25 ft/day to 350 ft/day. In Layer D, values ranged from 1 ft/day to 220 ft/day. In Layer E, values ranged from 7.5 ft/day to 120 ft/day. In Layer F, values ranged from 2.25 ft/day to 60 ft/day. The hydraulic properties of the "aquitards" include horizontal hydraulic conductivities of 1 foot per day, storage/specific yields of 1.0-6/7.0-2, and an effective porosity of 15 percent. Values for storage/specific yield, porosity, and recharge are unchanged from the values in the Regional Model. The hydraulic parameters were similar in each of the "aquitards" (i.e., model layers 3, 5, and 7).

The Zone 1 Model was calibrated to actual water level measurements collected from 81 monitoring wells between 1984 and 2002. The initial water levels in the transient calibration period of 1956 through 2002 were created during the TMR process, but were recreated for the nested model because the number of layers had increased from 6 to 8. An iterative process was used to create water levels consistent with 1956 conditions for the 8 nested model layers.

The adjustments to the grid cell hydraulic properties during the Zone 1 Model calibration were based on the initial values imported from the previously calibrated Regional Model. Transient calibration was conducted on a trial and error basis, and included adjusting the horizontal hydraulic conductivity, vertical hydraulic conductivity (vertical leakance), and river conductance of various grid cells. Vertical conductivities were defined as ten percent of horizontal conductivities in model layers 2, 4, 6, and 8 (Layers C, D, E and F). Because there was no aquitard layer defined between Layers B and C, the vertical conductivity in Layer B deviated from the 10 percent rule. The remaining influence on leakance was through model layers 3, 5, and 7. Vertical conductivities for these layers were calibrated to vary from 0.1 to 0.008 ft/day.

The Zone 1 Model was calibrated to observed water levels measured between 1984 and 2002 to within plus or minus four feet. Because the model uses annual stress periods, seasonal fluctuations are not evident in the data. Therefore, some residuals (difference between model-calculated and measured water levels) may be greater than 4 feet. Target well locations for the calibration period are posted for Layers B through F on Figures H2-2 through H2-6, respectively. The calibration statistics are provided in Table H2-1. Water level target data from the calibration are included in Table H-A. Potentiometric surface contour maps were also used to verify general groundwater flow directions, gradients, and vertical head differences within and between Layers B, C, D, E, and F.

Hydraulic containment evaluations were conducted by identifying the area of groundwater in each layer where chemical concentrations exceeded drinking water standards. In Zone 1, this area is defined by TCE concentrations of 5 µg/L.

H2.2 Zone 1 Existing System Hydraulic Containment

The area hydraulically contained by the existing ARGET and GET D systems was simulated to establish baseline conditions for developing the remedial alternatives. Particle tracking analysis was used to assess the areas of hydraulic containment. Groundwater extraction and recharge rates from 2003 were used for the ARGET and GET D systems during the model simulations as shown on Table H2-2. The simulation period of two years was sufficient to reach steady-state conditions and evaluate the containment area for each well.

Endpoint analysis was used to determine the starting location of each particle that was captured by the extraction wells. This analysis was conducted by releasing a single particle from the center of each model cell within the CoPC extents, and from adjacent model cells that could also be within the estimated containment area. During the simulations, particles that migrated to the extraction wells were considered within the area of hydraulic containment. Particles that did not migrate to extraction wells were considered outside of the containment area. The operation of the system was simulated for a 2-year period, after which steady-state conditions were reached in the model. The model-predicted containment areas of the GET D and ARGET systems in Layers C, D, and E are shown on Figures H2-7, H2-8, and H2-9, respectively.

North of the American River, the hydraulic containment provided by the ARGET system in Layer C appears to be incomplete for CoPCs present upgradient (southeast) of the extraction wells (Figure H2-7). Some CoPCs present downgradient (northwest) of this area were present prior to the initial operation of the ARGET extraction wells and are also not contained. In addition, CoPCs present south of ARGET Extraction Wells 4370 and 4375 and north of the Aerojet property boundary are not contained. Perchlorate is the primary CoPC in this area and is present due to the presence of perchlorate in the GET D effluent until perchlorate removal was added to GET D in the fall of 2002. The CoPCs south of the American River and north of Aerojet are addressed by the remedial action currently being implemented for the WGOU.

The area of hydraulic containment for Layer D is similar to that in Layer C, although the area contained by ARGET Extraction Wells 4302, 4350, and 4365 is relatively limited (Figure H2-8). It appears that the CoPCs present more than approximately 2,500 feet upgradient of these wells should be contained, although there are some areas closer to these extraction wells that may not be contained. The pumping rates from these wells are limited by relatively low permeability sediments and corresponding low yields.

Layer E Extraction Wells 4620 and 4585 appear to provide sufficient hydraulic containment of CoPCs in Layer E (Figure H2-9).

Path-line analyses were performed to estimate travel times of particles released from the potential source areas to the downgradient extraction wells. Figure H2-10 shows the extraction well areas of interest and estimated travel times. The following travel times were obtained from the path-line analyses:

- Potential upgradient source area to GET D – Approximately 8 years in Layer C and Layer D; and
- GET D area to the furthest downgradient extraction wells – Approximately 16 years in Layer C and Layer D.

H2.3 Remedial Alternative Z1-2 – Hydraulic Containment near the Downgradient Extent of CoPCs

Remedial Alternative Z1-2 was developed to assess the extraction wells necessary only for containing the downgradient extents of CoPCs. Under this scenario, selected existing ARGET and GET D extraction and recharge wells are operating, along with new wells. No recharge wells were used to recharge aquifers. The two recharge wells in GET D were converted for use as extraction wells. The treated groundwater currently recharged was assumed to be surface discharged out of the model domain. The ARGET extraction wells located south of the American River near the Nimbus Fish Hatchery were operating during this simulation because they improved the overall hydraulic containment. Two new wells were added in Layers C and D. In each layer a downgradient well was added to contain the toe of the plume north of the river. A new boundary well was added in each layer to aid in preventing additional off-site migration between GET D and GET E/F (located west of GET D). Pumping rates are presented in Table H2-2. The cumulative groundwater extraction rate for Alternative Z1-2 was 3,557 gpm, slightly higher than the current extraction rate of 3,356 gpm.

The area of hydraulic containment predicted for Layers C and D is presented on Figures H2-11 and H2-12, respectively. The area of model-predicted hydraulic containment in Layer E, which is the same as the current containment for Layer E, is shown on Figure H2-13.

The proposed extraction well locations and pumping rates downgradient of the existing ARGET extraction wells may change because site access in this area is limited by steep terrain and residential development.

Similarly, CoPCs present in Layers C and D south of the southwestern ARGET extraction wells and north of the Aerojet property are also uncontained (Figures H2-11 and H2-12). Additional remediation to address this area was not evaluated based on the following:

- Access to this developed area is limited by existing infrastructure;
- Public concerns raised during several previous attempts to install monitor wells, extraction wells, conveyance piping, and/or well-head treatment in the general area, and;

Remedial actions for the WGOU will address these CoPCs as will be demonstrated in the pending hydraulic evaluation for Area 2 of the WGOU in accordance with the schedule required by the United States Environmental Protection Agency (EPA) letter of 5 February, 2004.

With the exception of the two above-noted areas, Remedial Alternative Z1-2 appears to provide hydraulic containment for the remaining CoPCs present in Zone 1. ARGET Extraction Wells 4370 and 4375 do not appear to capture groundwater impacted by CoPCs, and no CoPCs have been reported in these wells. Therefore, these wells were not operating during the simulations conducted for the Zone 1 Remedial Alternatives.

Figure H2-10 shows the extraction well areas of interest and estimated travel times in Layers C and D. For Remedial Alternative Z1-2, the travel times were approximately 24 years for migration from the source areas, through GET D, to downgradient wells located at the toe of the plume. The estimated travel times from the source areas to the new boundary wells were approximately 10 years.

H2.4 Remedial Alternative Z1-3 - Hydraulic Containment with Interior Well Operation

Remedial Alternative Z1-3 was developed to assess the effects on hydraulic containment by operating selected existing GET D extraction wells in addition to those selected in Remedial Alternative Z1-2 to remove chemical mass closer to potential sources in Areas 20 and 49. The downgradient and interior extraction wells and pumping rates for Remedial Alternative Z1-3 are summarized in Table H2-2. Existing extraction wells that produce less than 5 gpm and remove low chemical concentrations (i.e., <5 µg/L TCE), or that do not contribute to hydraulic containment were generally not operated. As with Remedial Alternative Z1-2, the GET D recharge wells were operating as extraction wells. The treated groundwater currently recharged was assumed to be discharged to the ground surface outside of the model domain.

The area of hydraulic containment for the ARGET and GET D wells operating under Remedial Alternative Z1-3 was assessed using particle tracking analysis. As with the other scenarios, the simulation was conducted for a 2-year period, after which steady-state conditions were reached in the model. The areas of containment relative to the distribution of CoPCs in Layers C, D, and E, are shown on Figures H2-14, H2-15, and H2-16, respectively. As expected, the downgradient hydraulic containment is the same under both remedial alternatives. However, operating some interior GET D extraction wells provides a very slightly different containment area on the Aerojet Site, closer to potential source areas.

The estimated travel times for Remedial Alternative Z1-3 are shown on Figure H2-10. The travel times are the same as those for Remedial Alternative Z1-2, although the GET D extraction wells should reduce the TCE concentrations and therefore Cleanup Goals should be achieved more quickly.

H2.5 Zone 1 Summary

The hydraulic containment upgradient of the existing ARGET and GET D extraction systems was simulated using a groundwater flow model to develop a baseline for comparing remedial alternatives. Particle travel times were estimated from potential source areas in Zone 1 to the downgradient extraction wells. Remedial Alternatives Z1-2 and Z1-3 were developed to provide downgradient hydraulic containment of CoPCs not contained by the existing system operation.

The modeling simulations conducted to assess Remedial Alternatives Z1-2 and Z1-3 suggests that both alternatives should provide hydraulic containment of CoPCs present both upgradient and downgradient of the existing extraction systems. The simulations indicate that some CoPCs present between the Aerojet property boundary and the American River are uncontained. Provisions for addressing this area are included in the Final Remedial Design Submittal for Area 2 of the WGOU.

The travel time analysis suggests that groundwater travel times of approximately 24 years from the source areas to downgradient extraction wells in Layers C and D under these Remedial Alternatives. This information is used in the comparison of estimated aquifer restoration timeframes and cumulative operations and maintenance costs for the remedial alternatives.

H3.0 ZONE 2 GROUNDWATER FLOW SIMULATIONS

This section describes the groundwater flow model developed for the Zone 2 Perimeter Groundwater Operable Unit (PGOU) (Zone 2 PGOU), and it describes the results of modeling simulations performed to assess the estimated hydraulic containment for the Zone 2 PGOU. Modeling simulations were conducted to assess the following:

- For Remedial Alternative Z2-2, the locations and pumping rates of downgradient extraction wells estimated to achieve hydraulic containment of chemicals in groundwater south of White Rock Road between the White Rock Road North Dump (WRND) and the groundwater extraction and treatment F (GET) (GET F) system;
- For Remedial Alternative Z2-3, the effects of operating a "mass removal" extraction well in the area where higher trichloroethylene (TCE) and perchlorate concentrations are present north of White Rock Road, in conjunction with the downgradient extraction wells; and;
- Estimated travel times from apparent source areas.

The Regional Model developed for the Western Groundwater Operable Unit (WGOU) Remedial Investigation/Feasibility Study (RI/FS) was modified for the Zone 2 PGOU modeling (Aerojet, et. al., 2000). Particle tracking simulations were conducted to evaluate hydraulic containment, and to estimate travel times used in the Feasibility Study (FS) to compare potential aquifer restoration time frames. The area of hydraulic containment was assessed using particle tracking endpoint analysis. The times for groundwater to travel from the apparent source areas to the extraction wells were estimated using particle tracking path-line analyses.

H3.1 Zone 2 Model Background and Development

The Regional Model, modified for use in this analysis, is based on the United States Geological Survey (USGS) finite difference MODFLOWT code (McDonald and Harbaugh, 1988). GWVISTAS (Environmental Simulations, Inc., 1996) was used as both a pre-processor and post-processor in the Zone 2 Model. The construction and calibration of the WGOU groundwater model was included as Appendix D of the WGOU RI/FS (GeoTrans, Inc., 2000). The version of the Regional Model used for this analysis was modified in areas outside the area of concern for the Zone 2 modeling. Changes to the model that were relevant to this appendix included:

- Revised model layer designations, and;
- Addition of stress periods to simulate the operation of the proposed extraction wells.

The layer designations in the regional groundwater flow model were shifted up for the Zone 2 model. This was necessary because the regional groundwater flow model incorporates an approximate 1 degree dip to the southwest, and the layers in the Zone 2 PGOU were defined independently of the groundwater flow model. For this change, regional model layer 3 corresponds to hydrostratigraphic layer B. Similarly, model layers 4 and 5 correspond to hydrostratigraphic Layers D and E, respectively.

The period for the Zone 2 model simulations was increased from 27 to 29 stress periods increasing the simulation time from 46 years (1956-2002) to 48 years (2002-2005). The additional three-year simulation period was sufficient for the development of steady state conditions and the assessment of hydraulic containment. The hydraulic and hydrologic properties in the regional model were not changed in the Zone 2 model.

Hydraulic containment evaluations were conducted by identifying the area of groundwater in each layer where chemical concentrations exceeded drinking water standards. In Zone 2, this area is defined by TCE and perchlorate concentrations of 5 and 6 µg/L, respectively.

H3.2 Remedial Alternative Z2-2 - Hydraulic Containment South of White Rock Road

There are no existing remedial actions for Zone 2 within the PGOU. However, there are current and planned groundwater remedies in the areas surrounding the Zone 2 PGOU. The details of these remedies are discussed in the Zone 2 Remedial Investigation Report (Appendix B, Section B1.4), and include the existing WRND system to the east, the existing GET F system to the west, and potential GET systems that will be evaluated on the Inactive Rancho Cordova Test Site (IRCTS) to the southwest. A Feasibility Study is being conducted on the IRCTS to evaluate plume containment and potential source area remedial actions.

The downgradient extraction well locations were selected to provide hydraulic containment of TCE and perchlorate present in groundwater south of White Rock Road and north of the “circular feature” on the IRCTS. These locations should prevent or reduce migration of chemicals in groundwater from the Aerojet Site upgradient of the potential source areas on the IRCTS.

A trial and error approach was performed to determine the locations and estimated pumping rates for extraction wells to provide hydraulic capture of chemicals in Layers B and C. The range of modeled extraction rates was determined by the hydraulic parameters assigned in the regional model and the corresponding yield at each well.

The modeling simulations conducted to assess Remedial Alternative Z2-2 suggest that three extraction wells in Layer C should provide hydraulic containment across the width of the combined TCE and perchlorate plumes in Layers B and C (Figures H3-1 and H3-2). The hydraulic containment shown for Layer B is a result of groundwater extraction in Layer C. The cumulative extraction rate for this alternative is estimated at 1400 gallons per minute (gpm). The estimated individual extraction well pumping rates are summarized in Table H3-1.

Path-line analyses were performed to obtain estimated travel times of particles released from the suspected source areas in eastern Line 04 to the downgradient extraction wells. The travel times were approximately 22 years in each layer, as depicted on Figure H3-5.

H3.3 Remedial Alternative Z2-3 - Hydraulic Containment South of White Rock Road with "Mass Removal" Well

Remedial Alternative Z2-3 is the same as Remedial Alternative Z2-2, except that existing extraction well 4420 is operated at 150 gpm to capture higher concentrations of TCE and perchlorate closer to the source areas. The downgradient extraction wells operate at the same rates (i.e., 1400 gpm) as Remedial Alternative Z2-2. The estimated areas of hydraulic containment for Remedial Alternative Z2-3 are shown for Layers B and C on Figures H3-3 and H3-4, respectively. The extraction rates for this alternative are included in Table H3-1.

Path-line analyses were performed to obtain estimated travel times of particles released from the suspected source areas in eastern Line 04 to the downgradient extraction wells. Remedial Alternative Z2-3 can potentially reduce the estimated cleanup times by more quickly reducing the relatively high TCE and perchlorate concentrations and by reducing flux of chemicals from the source areas to the downgradient extraction wells.

H3.4 Zone 2 Summary

A modified version of the Regional Model was used to analyze hydraulic containment under Remedial Alternatives Z2-2 and Z2-3, developed for Zone 2. The modeling results suggest that 3 extraction wells screened in Layer C operating an estimated cumulative pumping rate of 1,400 gpm should provide hydraulic for Layers B and C. An additional 150 gpm from well 4420 should provide additional removal of groundwater with elevated concentrations of CoPCs. The model-estimated travel times for groundwater to travel from the potential source areas to the downgradient extraction wells is approximately 22 years in each layer.

H4.0 ZONE 3 GROUNDWATER FLOW SIMULATIONS

This section describes the groundwater flow model developed for the Zone 3 Perimeter Groundwater Operable Unit (PGOU) (Zone 3 PGOU), and it describes the results of modeling simulations performed to evaluate potential remedial alternatives for the Zone 3 PGOU. Groundwater flow simulations were performed to assess hydraulic containment of the existing groundwater extraction and treatment B (GET) (GET B) system, and potential Remedial Alternatives Z3-2 and Z3-3.

The groundwater modeling for the Zone 3PGOU was conducted to assess the following:

- The long-term hydraulic containment of the existing GET B system;
- For Remedial Alternative Z3-2, the locations and pumping rates of extraction wells estimated to achieve hydraulic containment near the downgradient extents of CoPCs;
- For Remedial Alternative Z3-3, the locations and pumping rates of extraction wells estimated to achieve hydraulic containment near the downgradient extents of CoPCs and the estimated effects from operating mass removal wells, and;
- Estimated travel times from apparent source areas to the downgradient extraction wells.

The Regional Model developed for the Western Groundwater Operable Unit (WGOU) Remedial Investigation/Feasibility Study (RI/FS) was modified for the Zone 3 PGOU modeling (Aerojet, et. al., 2000). Particle tracking simulations were conducted to evaluate hydraulic containment, and to estimate travel times used in the Feasibility Study (FS) to compare potential aquifer restoration time frames. The area of hydraulic containment was assessed using particle tracking endpoint analysis. The times for groundwater to travel from the apparent source areas to the extraction wells were estimated using particle tracking path-line analyses.

Following this introduction, this section provides a description of the Zone 3 groundwater model background and development; the development of Alternatives Z3-2 and Z3-3; and a summary of this analysis.

H4.1 Zone 3 Model Background and Development

The Regional Model, modified for use in this analysis, is based on the United States Geological Survey (USGS) finite difference MODFLOWT code (McDonald and Harbaugh, 1988). GWVISTAS (Environmental Simulations, Inc., 1996) was used as both a pre-processor and post-processor in the Zone 2 Model. The construction and calibration of the WGOU groundwater model was included as Appendix D of the WGOU RI/FS (GeoTrans, Inc., 2000). The version of the Regional Model used for this analysis was modified in areas outside the area of concern for the Zone 3 modeling.

- Expansion of the model grid to the south-southeast

- Creation of a nested model centered on Zone 3

The Regional Model was expanded because the Zone 3 PGOU extends beyond the former boundaries of the Regional Model. Figure H4-1 shows the expanded Regional Model and the location of the Zone 3 Model relative to the Regional Model. The eastern model boundary generally corresponds to bedrock, and the southern model boundary is approximately parallel to the regional groundwater flow direction. The hydraulic parameters (hydraulic conductivity, layering, storativity, areal recharge, general head boundaries) in Regional Model were extended into the expanded Zone 3 Model (GeoTrans, 2000). The expansion of the Regional Model boundaries did not negatively affect the model calibration.

Figure H4-2 shows the model grid of the Zone 3 Model. Grid dimensions in the center of the model grid, where existing and proposed extraction wells are located, are 100 feet by 100 feet. The grid dimensions are 500 feet by 500 feet along the outer margins of the model area.

The boundaries of the Zone 3 Model are constant head boundaries, and they change during each stress period (Figure H4-2). The head values designated for the boundary conditions of the Zone 3 Model are obtained from the Regional Model. The northeast and eastern portion of the southeastern model boundaries are no-flow boundaries.

The simulation period of the Zone 3 Model is from 1998 to 2045. Areal recharge with the Zone 3 Model was assigned a long-term average. This was the same period for the remedial alternative simulations presented in the WGOU RI/FS. For the purposes of estimating hydraulic containment, it is assumed that extraction wells begin pumping in 2005 and continue pumping at constant rates until 2045. The effective porosity was assumed to be 15 percent in each layer for the particle tracking simulations.

For all simulations conducted to estimate hydraulic containment and travel times, water supply Well 1059 was assumed to operate. This well is screened in Layers C and D, and based on annual production, was operating at 28 gpm during the model simulations.

Hydraulic containment evaluations were conducted by identifying the area of groundwater in each layer where chemical concentrations exceeded drinking water standards. In Zone 3, this area is defined by TCE, perchlorate, and N-nitrosodimethylamine (NDMA) concentrations of 5, 6, and 0.01 µg/L, respectively.

H4.2 Zone 3 Existing System Hydraulic Containment

The current GET B hydraulic containment was evaluated based on extraction well pumping rates in 2003. These rates were established based on the available treatment system capacity and the effluent discharge limits for GET B. The pumping rates and extraction well locations varied in the years prior to 2003.

Table H4-1 summarizes the extraction wells and pumping rates used to estimate hydraulic containment under existing conditions. There were 17 extraction wells operating at a cumulative rate of 1,223 gpm. Figures H4-3 through H4-5 show estimated hydraulic containment under existing conditions for Layers B, C, and D, respectively. Hydraulic containment shown in Layer B (Figure H4-3) is caused by the migration of groundwater into Layers C and D and subsequent removal by extraction wells screened in those layers. No hydraulic containment was observed in Layers E or F.

H4.3 Remedial Alternative Z3-2 – Hydraulic Containment near the Downgradient Extent of CoPCs

Alternative Z3-2 is designed to provide hydraulic containment at the farthest downgradient extent of CoPCs. Table H4-2 summarizes the extraction wells, locations and pumping rates used to achieve hydraulic containment of CoPCs in all hydrostratigraphic layers under Alternative Z3-2. Six existing wells and twelve new wells were used with a total pumping rate of 1,902 gpm.

Existing Extraction Well 4570 which is screened in Layers C and D was used to assist in providing containment near the southwestern downgradient extent of CoPCs.

Figures H4-6 through H4-10 show the modeled hydraulic containment for Layers B through F, respectively. Hydraulic containment shown in Layer B (Figure H4-6) was caused by the migration of groundwater into Layers C and D and subsequent removal by extraction wells screened in those layers. CoPCs in all layers are hydraulically contained by this alternative.

Table H4-2 summarizes the travel times to extraction wells of particles originating in each of the hydrostratigraphic layers at the apparent source areas. Particles reach downgradient wells from 24 to 32 years in Layers B, C, and D, and from 16 to 17 years in Layers E and F.

H4.4 Remedial Alternative Z3-3 – Hydraulic Containment with Interior Well Operation

Alternative Z3-3 is designed to provide hydraulic containment at the farthest downgradient extent of CoPCs while operating existing extraction wells screened within the interior of the plumes to reduce chemical mass and aquifer restoration time frames. Table H4-3 summarizes the extraction wells, locations and pumping rates used to achieve hydraulic containment of CoPCs in all hydrostratigraphic layers under Alternative Z3-3. Twelve existing wells and twelve new wells were used with a total pumping rate of 2,555 gpm. Existing Extraction Well 4570 was operated to provide hydraulic containment along southwestern extent of chemicals in Layers C and D.

Figures H4-11 through H4-15 show hydraulic containment estimated for Layers B through F, respectively. Hydraulic containment shown in Layer B (Figure H4-11) was caused by the migration of groundwater into Layers C and D and subsequent removal by extraction wells screened in those Layers. CoPCs in all layers are hydraulically contained by this alternative.

Table H4-3 summarizes estimated travel times from apparent source areas to the downgradient extraction wells. Although complete extraction of higher concentrations of CoPCs in not achieved, this should reduce overall extraction and treatment times. Under Remedial Alternative Z3-3, the estimated travel times are reduced from 24 to 12 years in Layer B, from 32 to 16 years in Layer C, from 28 to 12 years in Layer D, from 17 to 10 years in Layer E, and from 16 to 8 years in Layer F, compared with Remedial Alternative Z3-2.

H4.5 Zone 3 Summary

The existing Regional Model was modified to create a nested model centered on Zone 3. The modifications consisted of expanding the model grid to the east and south-southeast. The nested model contains a finer grid spacing to allow a more detailed estimation of hydraulic containment for existing pumping conditions and two alternatives.

Estimates generated by existing pumping conditions revealed incomplete containment of CoPCs over a 35 year period. The pumping well configuration of Alternative Z3-2 was estimated to hydraulically contain the CoPCs within a 35 year time period with relatively long travel time estimates from apparent source areas to extraction wells. The pumping well configuration of Alternative Z3-3 also was estimated to hydraulically contain the CoPCs within a 35-year time period. Estimated travels times from apparent source areas to extraction wells were comparatively shorter under Alternative Z3-3.

H5.0 ZONE 4 GROUNDWATER FLOW SIMULATIONS

This section describes the groundwater flow model developed for the Zone 4 Perimeter Groundwater Operable Unit (PGOU) (Zone 4 PGOU), and it describes the results of modeling simulations performed to assess the estimated hydraulic containment for the Zone 4 PGOU. Modeling simulations were conducted to show the following:

- For Remedial Alternative Z4-2 the locations and pumping rates of extraction wells estimated to achieve hydraulic containment near the downgradient extents of CoPCs;
- For Remedial Alternative Z4-3, the locations and pumping rates of extraction wells estimated to achieve hydraulic containment near the downgradient extents of CoPCs, and the potential effects from operating interior extraction wells closer to the source areas, and;
- Estimated travel times from apparent source areas.

A steady-state groundwater flow model was developed to assess the remedial alternatives in the Zone 4 PGOU. The area of groundwater hydraulically contained in these simulations was estimated using particle tracking endpoint analysis. In addition to the hydraulic containment evaluations, particle travel times were estimated using particle tracking path-line analyses. The following sections describe the model background and development, hydraulic containment of the existing GET A system, and the additional groundwater extraction estimated for completing hydraulic containment.

H5.1 Zone 4 Model Background and Development

The Zone 4 Model is based on the USGS finite difference Modflow96 code (McDonald and Harbaugh, 1988). GWVISTAS (Environmental Simulations, Inc., 1996) was used as both a pre-processor and post-processor during the development of the Zone 4 model.

A steady-state three-dimensional groundwater flow model was created to simulate groundwater flow conditions in Zone 4. The structure of the model is based on the hydrostratigraphic layering shown on cross sections A-A', B-B', and C-C' in Zone 4 of the PGOU RI Report (Aerojet, et. al., 2005). Model Layer 1 represents Layer A and was modeled as unconfined. Model Layer 2 represents Layer B, was modeled as confined, and is present only in the northwest portion of the Zone 4 Model. The layers in the Zone 4 Model were divided into model grid cells that are distributed in 140 rows and 125 columns. Each model grid cell represents an area measuring 100 x 100 feet, and the model grid encompasses approximately 6.3 square miles (Figure H5-1).

Hydraulic conductivities in the model range from 2.25 ft/day to 300 ft/day, and are within the ranges estimated from aquifer testing of the GET A extraction wells (Aerojet, 1993b and 1995). The distribution of hydraulic conductivities used in the Zone 4 Model is shown for Layers A and B on Figures H5-2 and H5-3, respectively.

Areal recharge was applied to the Zone 4 Model based on urban and non-urban type land surfaces. A value of 0.001 ft/day/ft2 was applied to non-urban areas, while 0.0005 ft/day/ft2 recharge was applied urban areas.

Constant head boundaries were used with the values based on actual water level measurements collected in October 2002. For the modeling simulations, the extraction rates for some existing GET A extraction wells were adjusted, if necessary, within the ranges achieved during past operations. Unless otherwise noted, the existing GET A extraction wells operated at the same rates used in 2002.

The Zone 4 Model was calibrated based on water level measurements collected in October 2002, from 54 monitoring locations that are shown on Figure H5-1. The monitor wells, layer designations, actual water levels, model-predicted water levels, and the difference or residual between actual and model-predicted water levels are summarized in Table H5-1. The statistical analysis is also presented on Table H5-1.

Hydraulic containment evaluations were conducted by identifying the area of groundwater in each layer where chemical concentrations exceeded drinking water standards. In Zone 4, this area is defined by TCE and N-nitrosodimethylamine (NDMA) concentrations of 5 and 0.01 µg/L, respectively.

H5.2 Zone 4 Existing System Hydraulic Containment

The areas hydraulically contained by the existing GET A system were evaluated with the model using endpoint particle tracking analysis. Endpoint analysis was used to determine the starting location of each particle that was captured by the GET A extraction wells. This analysis is conducted by releasing a single particle from the center of each model cell located within the extents of CoPCs, and by releasing a single particle from model cells located within the estimated containment area. During the simulations, particles that migrate to the extraction wells are considered within the area of hydraulic containment. Particles that do not flow to an extraction well are considered uncontained. Path-line particle tracking analysis was performed to estimate particle travel times from the potential source areas to the extraction wells.

The model simulations were based on the pumping rates in the year 2002, as summarized in Table H5-2. The model-predicted area of hydraulic containment of the existing GET A system is shown on Figure H5-4. The simulation results suggest that CoPCs located east and south (upgradient) of the northern GET A extraction wells are within the area of hydraulic containment.

Travel time from potential source areas to internal wells (4012, 4013, and 4430) is approximately 10 years, as depicted on Figure H5-5. Travel time from the internal wells to the downgradient wells is approximately 15 years, also shown on Figure H5-5.

H5.3 Remedial Alternative Z4-2 – Hydraulic Containment near the Downgradient Extent of CoPCs

Remedial Alternative Z4-2 was developed to estimate the number, locations and pumping rates for extraction wells to complete hydraulic containment of TCE and NDMA west of the existing GET A system. New extraction well locations and pumping rates were selected to avoid interference with the existing hydraulic containment.

A trial and error approach was performed to determine the locations and estimated pumping rates for extraction wells to provide hydraulic capture of chemicals in Layers A and B. Existing interior Extraction Wells 4012, 4013, and 4030 were not required for hydraulic containment, and therefore, are not operating during the Remedial Alternative Z4-2 simulations. Particle tracking simulations were run with the same method used for the Existing Conditions analysis, as described in the previous section. The pumping rates for the remaining GET A extraction wells and the proposed extraction wells are summarized in Table H5-2.

The model results suggest that seven new extraction wells may be necessary to provide hydraulic containment at the downgradient extents of CoPCs in Zone 4 groundwater. Figures H5-6 and H5-7 present the containment for Layers A and B, respectively. Extraction wells Z4-A1, Z4-A2, and Z4-A3 were added to address TCE just west of the existing GET A extraction wells. Layer A extraction wells Z4-A4, Z4-A5, and Z4-A6, and Layer B extraction well Z4-B1 were added farther to the west to address NDMA in Layers A and B. The downgradient extent of NDMA in Layer B this area is uncertain, and one additional monitor well has been recommended north of Highway 50 to characterize this area.

Under Remedial Alternative Z4-2, the cumulative extraction rate in Zone 4 would be increased from the current total flow rate of 237 gpm to an estimated 644 gpm. The comparatively high pumping rates estimated for the new wells compared with the existing wells may be attributable to a general westward thickening of the sediments and resultant increase in transmissivities.

Travel time from potential source areas to the existing downgradient GET A extraction wells is approximately 25 years, as depicted on Figure H5-5. Travel time from the potential source area to the new downgradient extraction wells is approximately 15 years, also shown on Figure H5-5.

The longest travel time estimate for the various groundwater flow-paths is 25 years. The source(s) of TCE and NDMA in the west is/are uncertain, and travel times were estimated from the upgradient side of the CoPC extents to the proposed extraction well locations.

H5.4 Remedial Alternative Z4-3 – Hydraulic Containment with Interior Well Operation

Remedial Alternative Z4-3 was developed to utilize existing interior extraction wells to remove additional chemical mass and potentially reduce aquifer restoration timeframes, while providing the same degree of hydraulic containment as Remedial Alternative Z4-2. The downgradient extraction wells and pumping rates for Remedial Alternative Z4-3 are the same as those for Remedial Alternative Z4-2, however, existing interior Extraction Wells 4012, 4013, and 4030 are operating at their 2002 pumping rates (Table H5-2). The cumulative flow rate under Remedial Alternative Z4-3 is estimated at 667 gpm.

The particle tracking analysis suggests that operating the interior extraction wells under Remedial Alternative Z4-3 does not affect the area of hydraulic containment in Layer A because the containment areas for the downgradient and interior extraction wells overlap (Figure H5-8). Figure H5-9 presents the hydraulic containment predicted for Alternative Z4-3 in Layer B.

Operating the interior extraction wells may reduce potential restoration timeframes. Figure H5-5 shows the model-predicted flow-paths and estimated travel times for particles to reach the interior, downgradient, and potential new western extraction wells from the suspected source areas under Remedial Alternative Z4-3. These times are effectively identical to corresponding pathways from the Existing operation and Alternative Z4-2.

The estimated travel times suggest that Remedial Alternative Z4-3 could reduce the longest travel times from 25 to 15 years because the interior extraction wells are operating compared to Remedial Alternative Z4-2 where they are not. The relatively long travel time from the interior to the downgradient GET A extraction wells is due in part to stagnation zones and also the relatively low hydraulic conductivities in that area. The source(s) of TCE and NDMA in the west is uncertain, but was assumed to be relatively close to the downgradient extents based on water quality data from upgradient monitor wells.

H5.5 Zone 4 Summary

A steady-state groundwater flow model was developed to analyze hydraulic containment of the Existing Operation, and under Remedial Alternatives Z4-2 and Z4-3, for Zone 4.

The GET A system was not designed to provide hydraulic containment for CoPCs present west of the existing extraction wells, but as suggested by the modeling results, containment is complete upgradient of the existing well field. The model results also indicate that TCE and NDMA present in three relatively small areas are not contained by the existing system. Remedial Alternative Z4-2 was developed to identify the extraction well locations and pumping rates estimated to complete hydraulic containment. The modeling simulations suggest that up to seven new extraction wells, pumping at an additional combined rate of 430 gpm, should complete hydraulic containment.

Remedial Alternative Z4-3 was developed to determine whether operating three existing interior extraction wells that are located closer to the potential sources areas would reduce estimated groundwater travel times. The modeling results suggest that the longest travel times may be reduced from 25 to 15 years due to the operation of the interior extraction wells.

H6.0 REFERENCES CITED

Aerojet, 1993, “Aerojet Site – Part 2 GET Effectiveness Report”, Aerojet General Corporation, April 1993.

Aerojet, 1995b, “Aerojet Site – Zone 4 GET Effectiveness Report”, Aerojet, 1995.

Aerojet, et. al., 2003 “Draft Perimeter Groundwater Operable Unit Remedial Investigation Report”, Aerojet General Corporation and Central Valley Environmental, Inc., September 2003.

Aerojet, et. al., 2004 “Groundwater Model Update Report - Western Groundwater Operable Unit (OU-3)”, Aerojet General Corporation and Central Valley Environmental, Inc., January 2004.

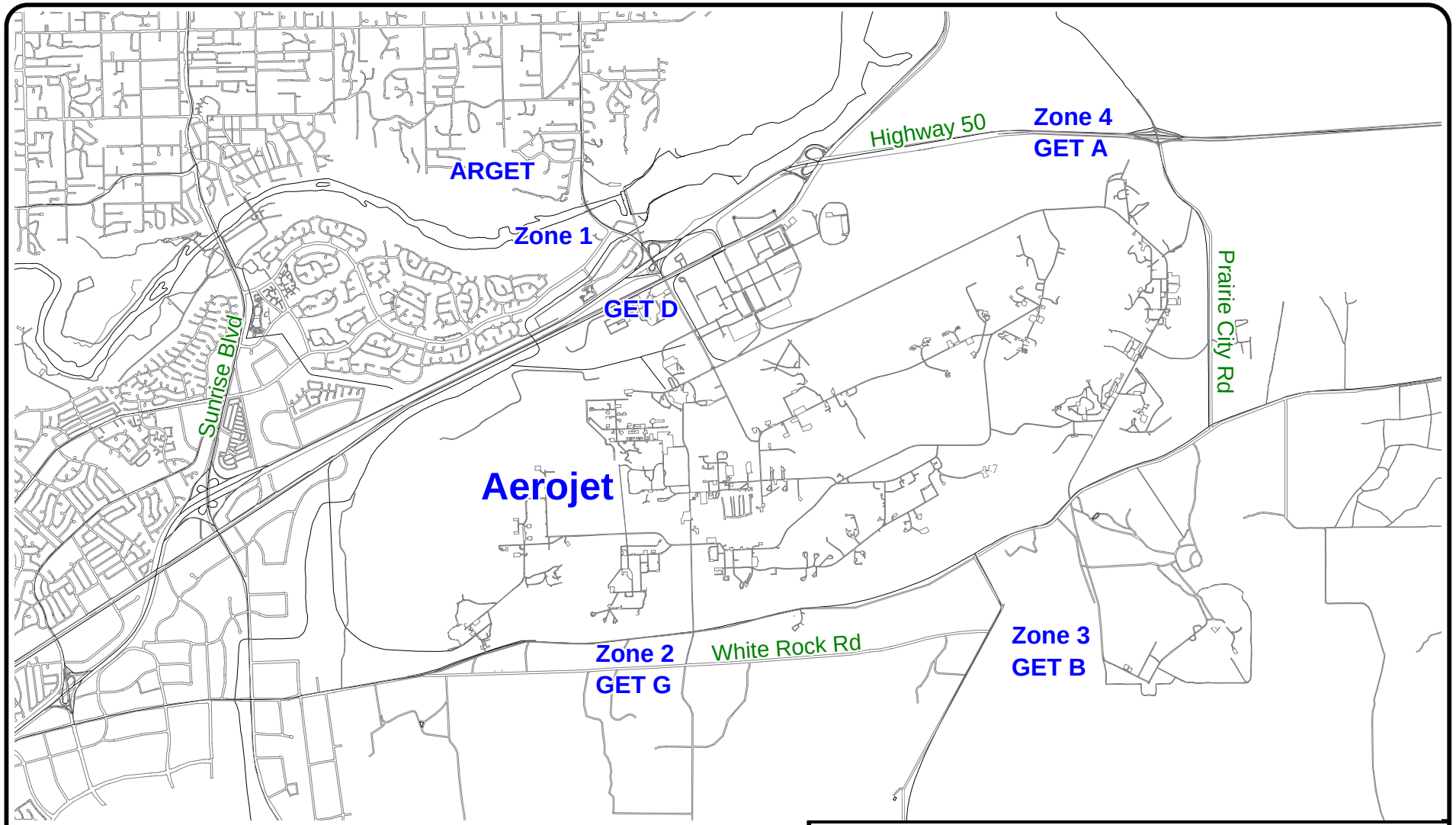
Environmental Simulations, Inc., 1996, “Guide to Using Groundwater Vistas, Advanced Model Design and Analysis”.

EPA, 1988, “Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA Interim Final”, United States Environmental Protection Agency, EPA/540/G-89/004, October, 1988.

GeoTrans Inc., 2000 “Western Groundwater Operable Unit RI/FS Groundwater Flow Model”, GeoTrans, Inc., April 2000.

McDonald, M.G., and Harbaugh, A.W., 1988, “A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model”, Techniques of Water-Resources Investigations of the United States Geological Survey, Book 6, Modeling Techniques, Chapter A1.

C:\AEROJET\GIS\SiteLayout.WOR



The purpose of this figure is to map out the general locations of the GET facilities and zones modeled for this PGOU FS.

N

0 5,000 10,000
feet

TITLE: General Zone and GET Facility Locations

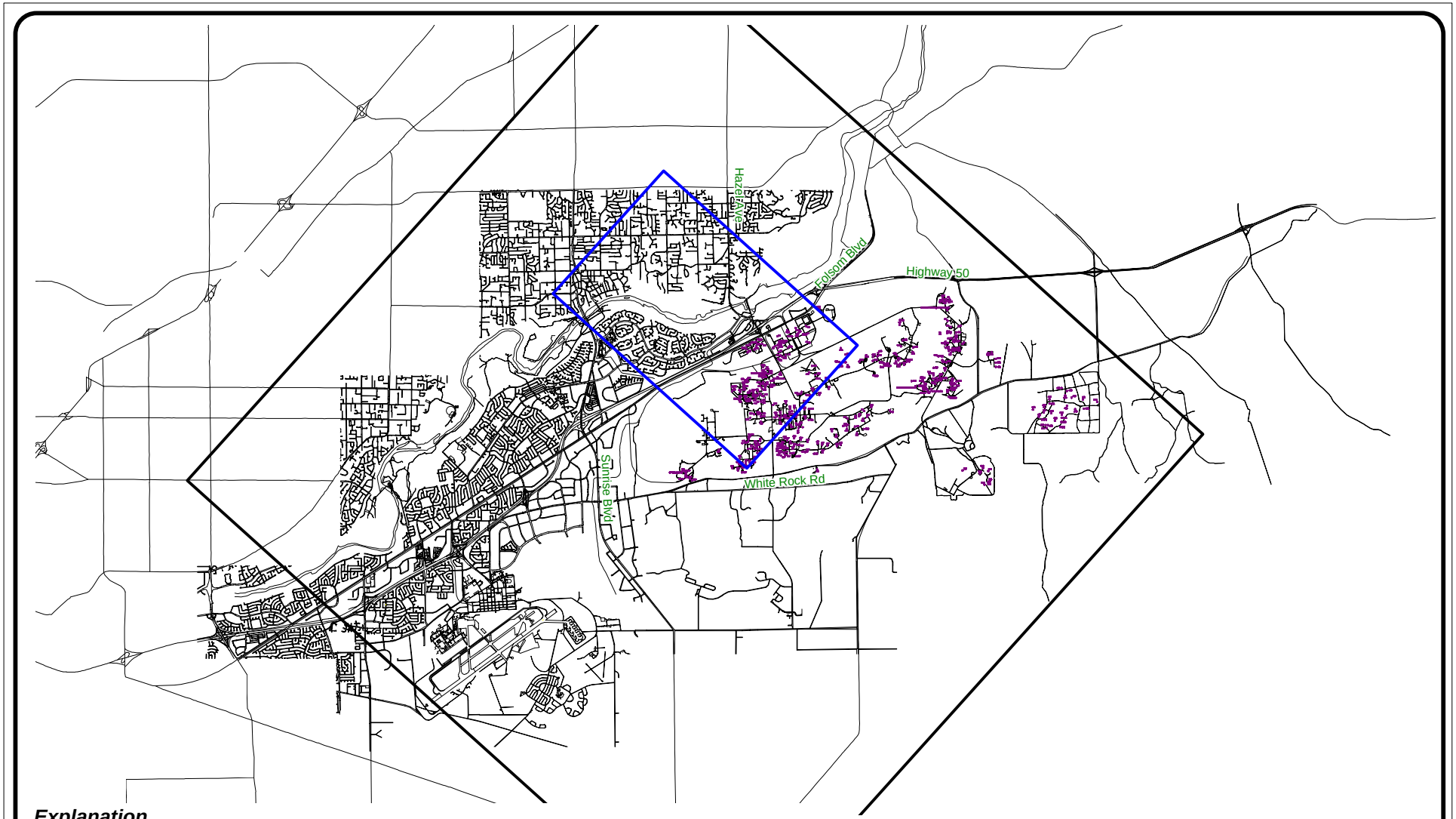
LOCATION: GenCorp Aerojet, Rancho Cordova, CA

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		H1-1
FILE		
DATE		

SR40114570

C:\AEROJET\ZONE 1\GIS\Z1-Grid.WOR



Explanation

Zone 1 Refined Model Grid Boundary

Regional Model Grid Boundary

N

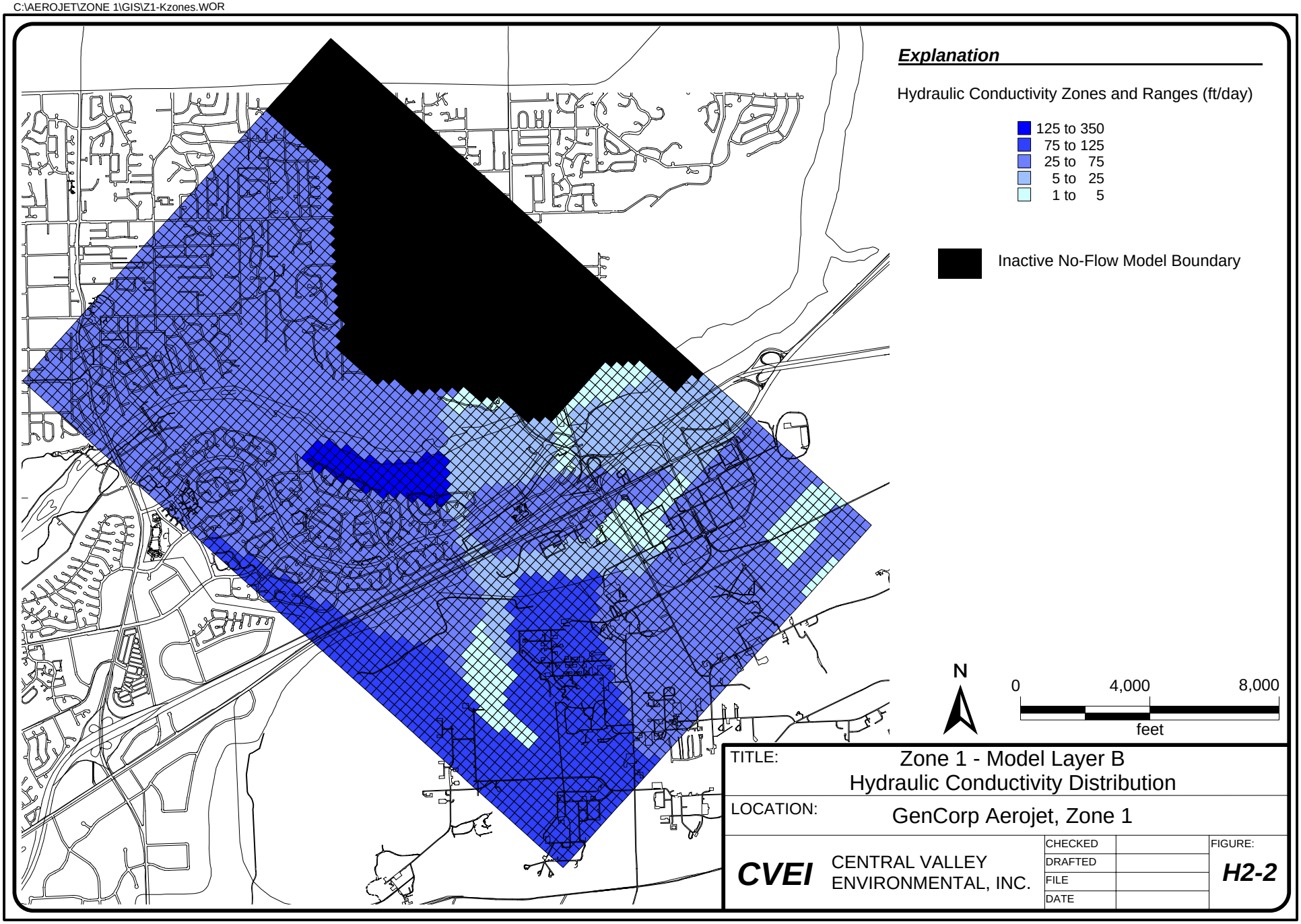
0 12,500 25,000

feet

TITLE:	Zone 1 Model Grid Location		
LOCATION:	GenCorp Aerojet, Zone 1		
CVEI	CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED / DRAFTED / FILE / DATE	FIGURE: ***H2-1***

SR10114570

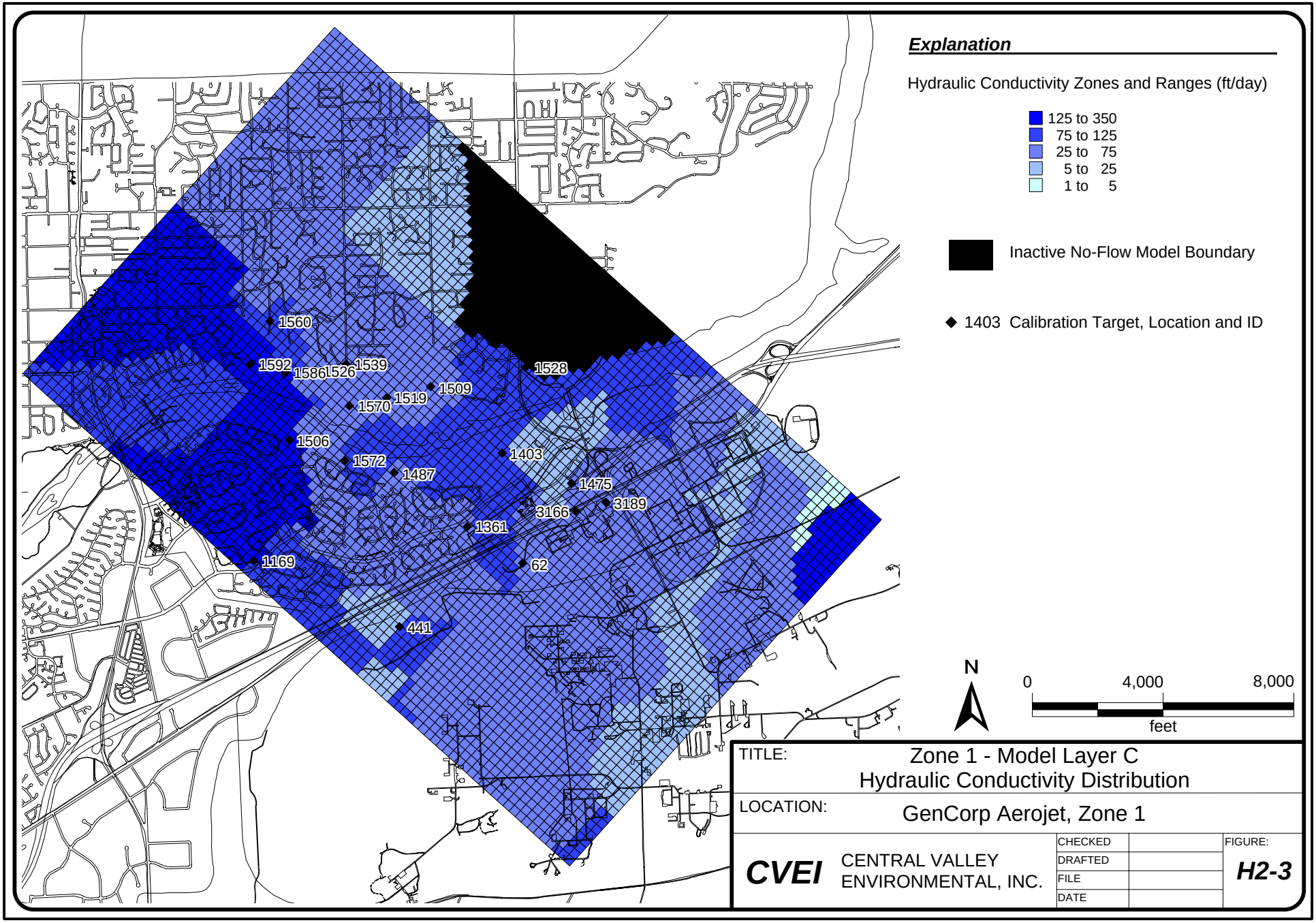
C:\AEROJET\ZONE 1\GIS\Z1-Kzones.WOR



TITLE:	Zone 1 - Model Layer B Hydraulic Conductivity Distribution		
LOCATION:	GenCorp Aerojet, Zone 1		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		H2-2
	FILE		
	DATE		

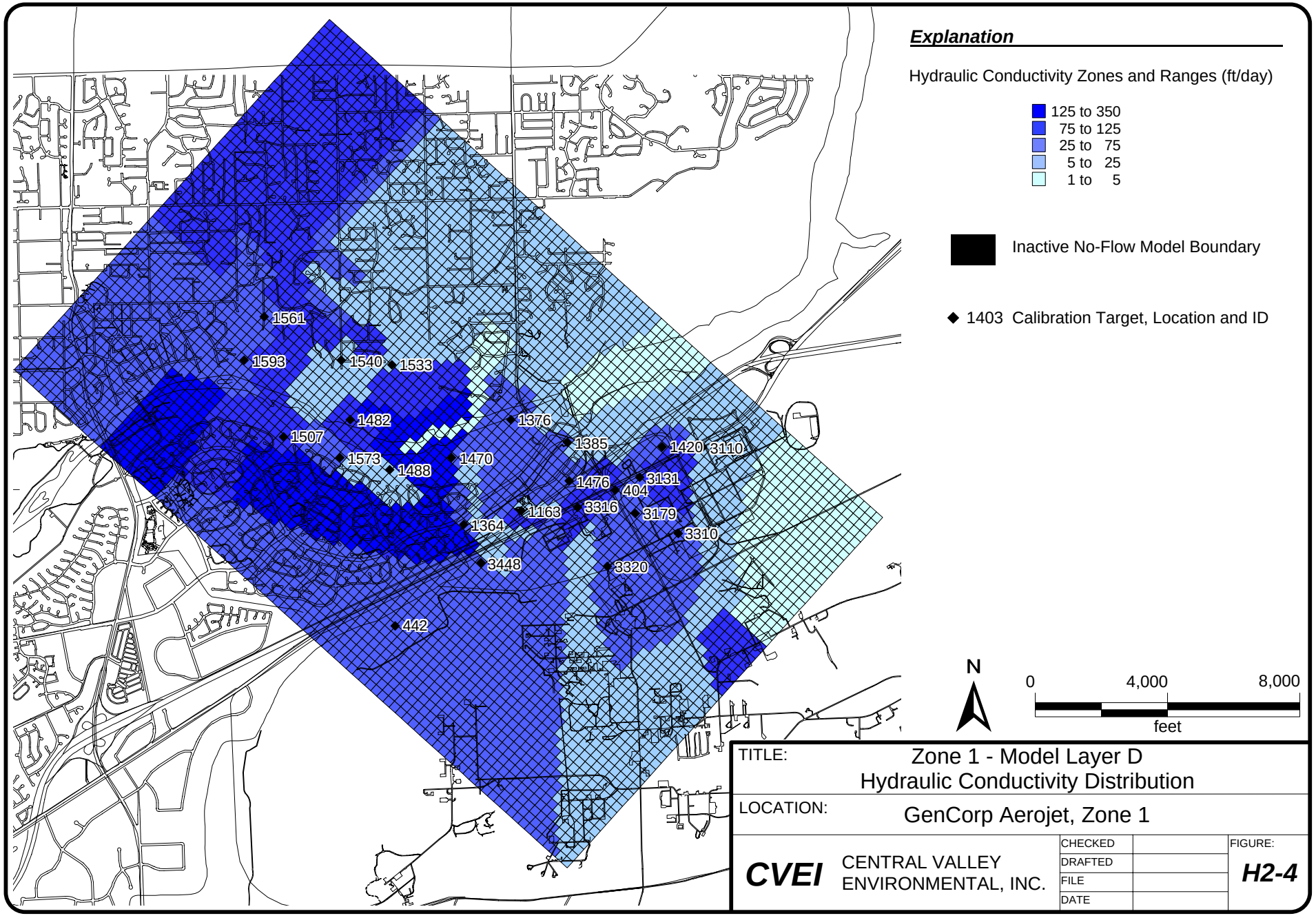
SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Kzones.WOR



SR10114570

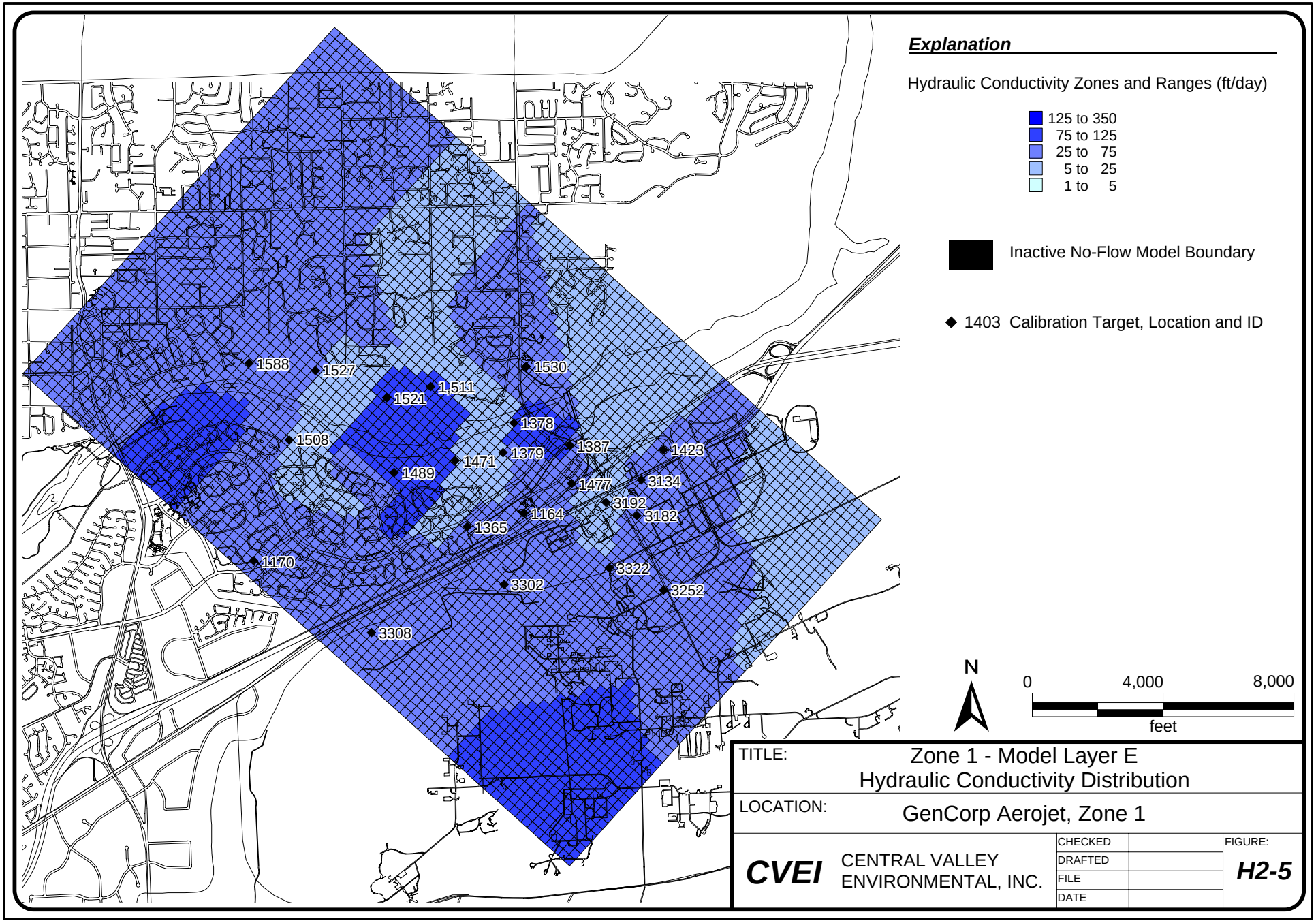
C:\AEROJET\ZONE 1\GIS\Z1-Kzones.WOR



TITLE:	Zone 1 - Model Layer D Hydraulic Conductivity Distribution		
LOCATION:	GenCorp Aerojet, Zone 1		
CVEI	CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED DRAFTED FILE DATE	FIGURE: H2-4

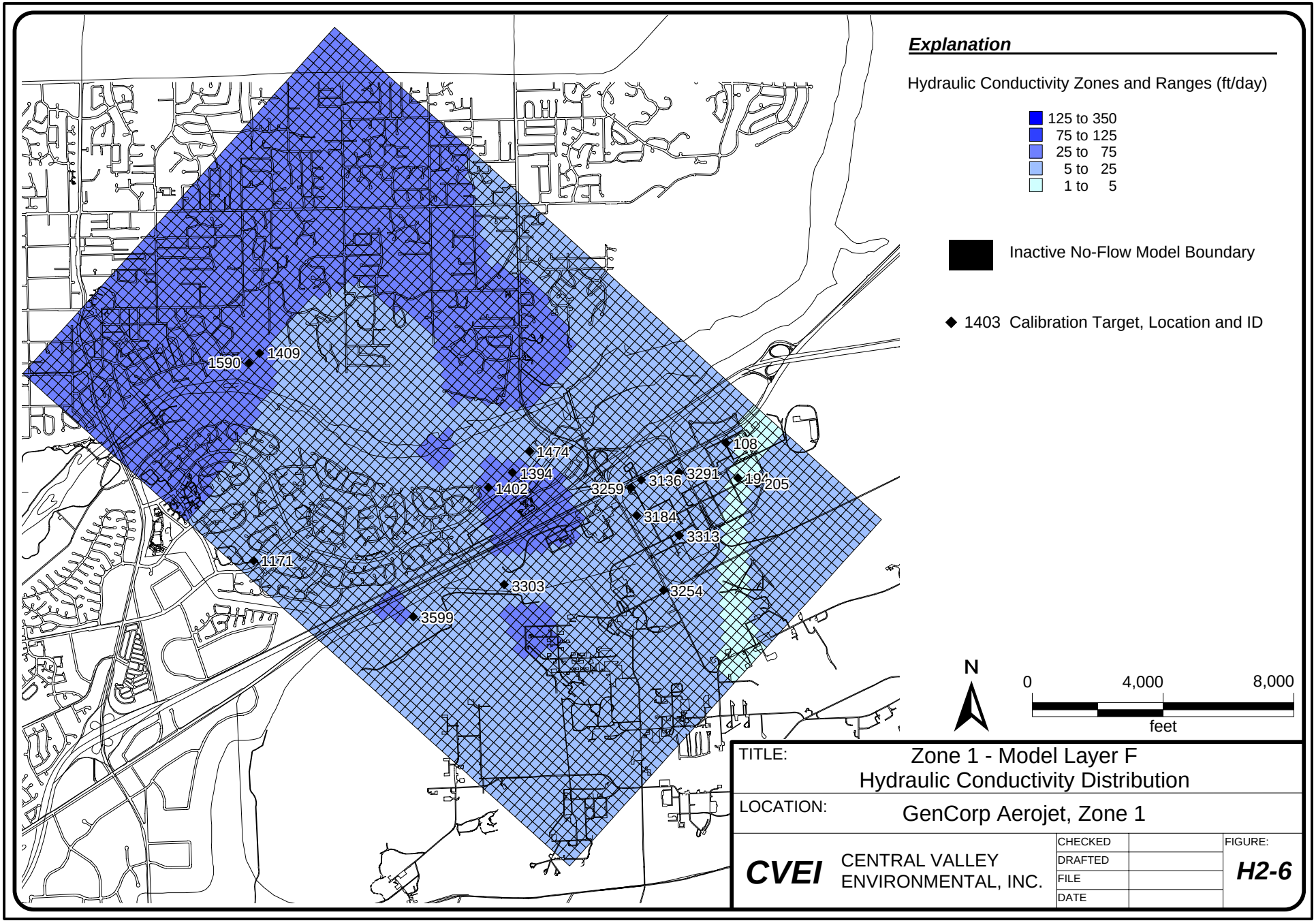
SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Kzones.WOR



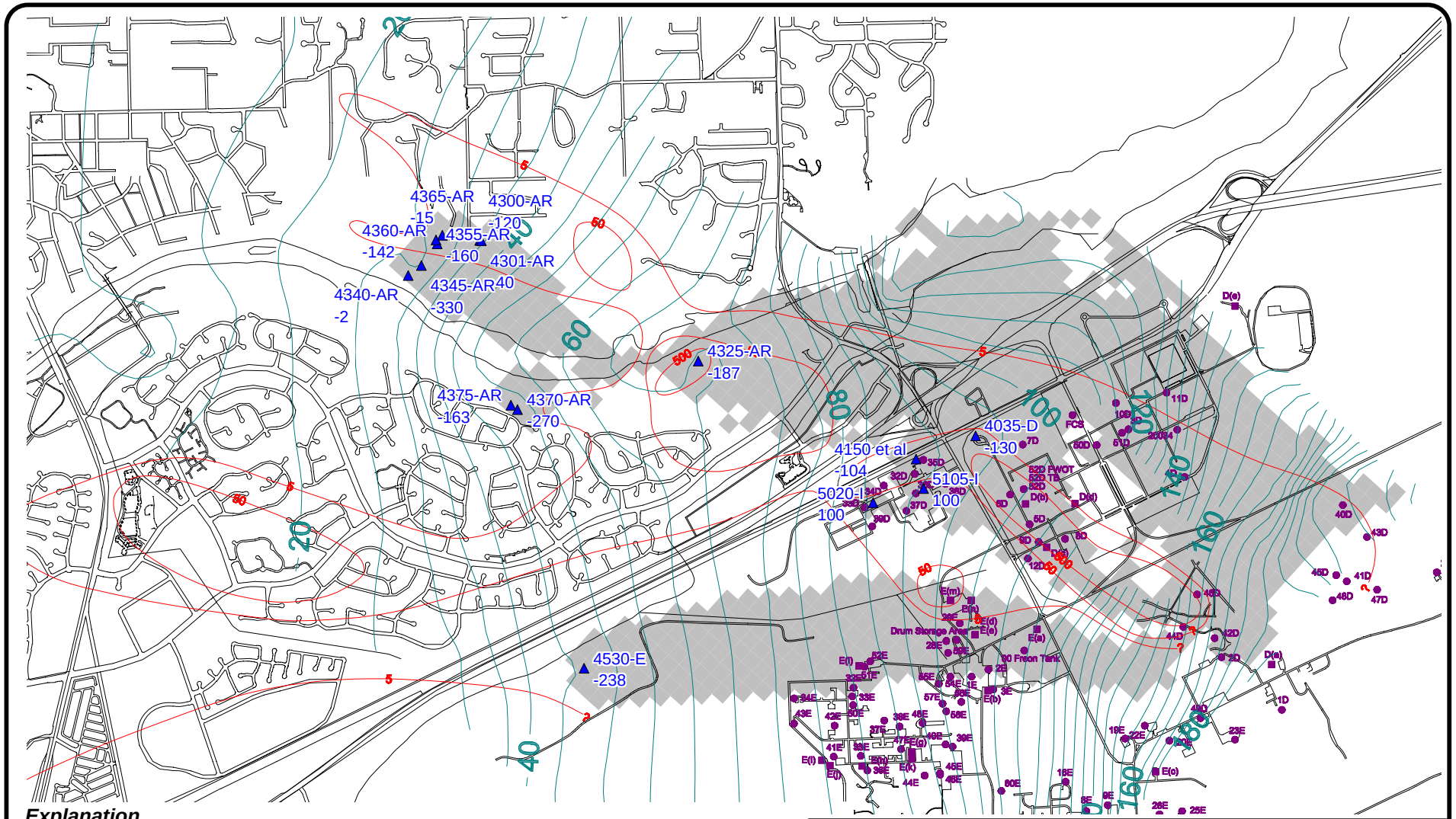
SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Kzones.WOR



SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Existing.WOR



Explanation

- ▲ 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- ▼ 5020-I 200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown.

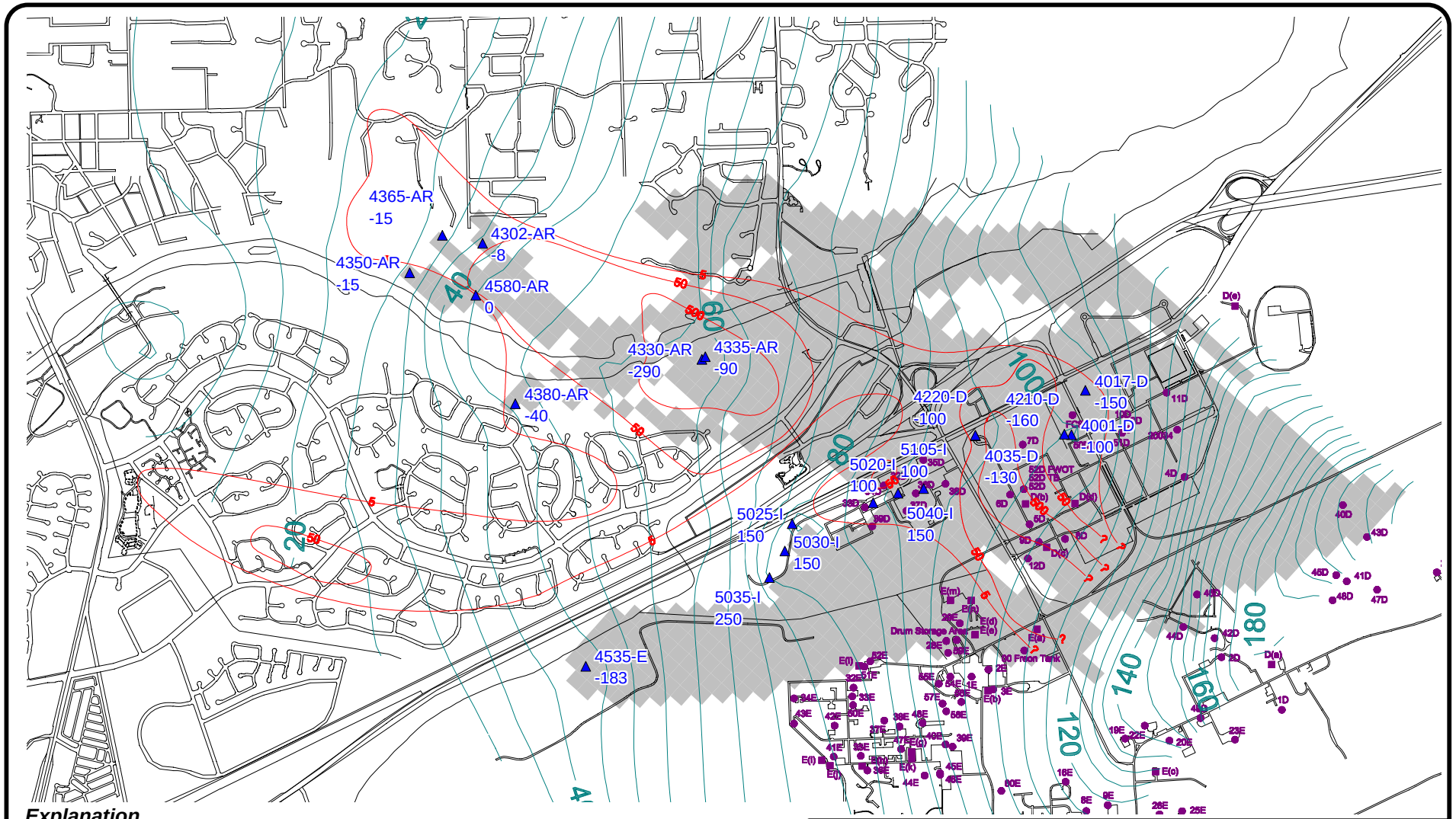
TITLE:	Existing Hydraulic Containment ARGET and GET D, Layer C
LOCATION:	GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-7**
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Existing.WOR



Explanation

- ▲ 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- ▼ 5020-I 200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

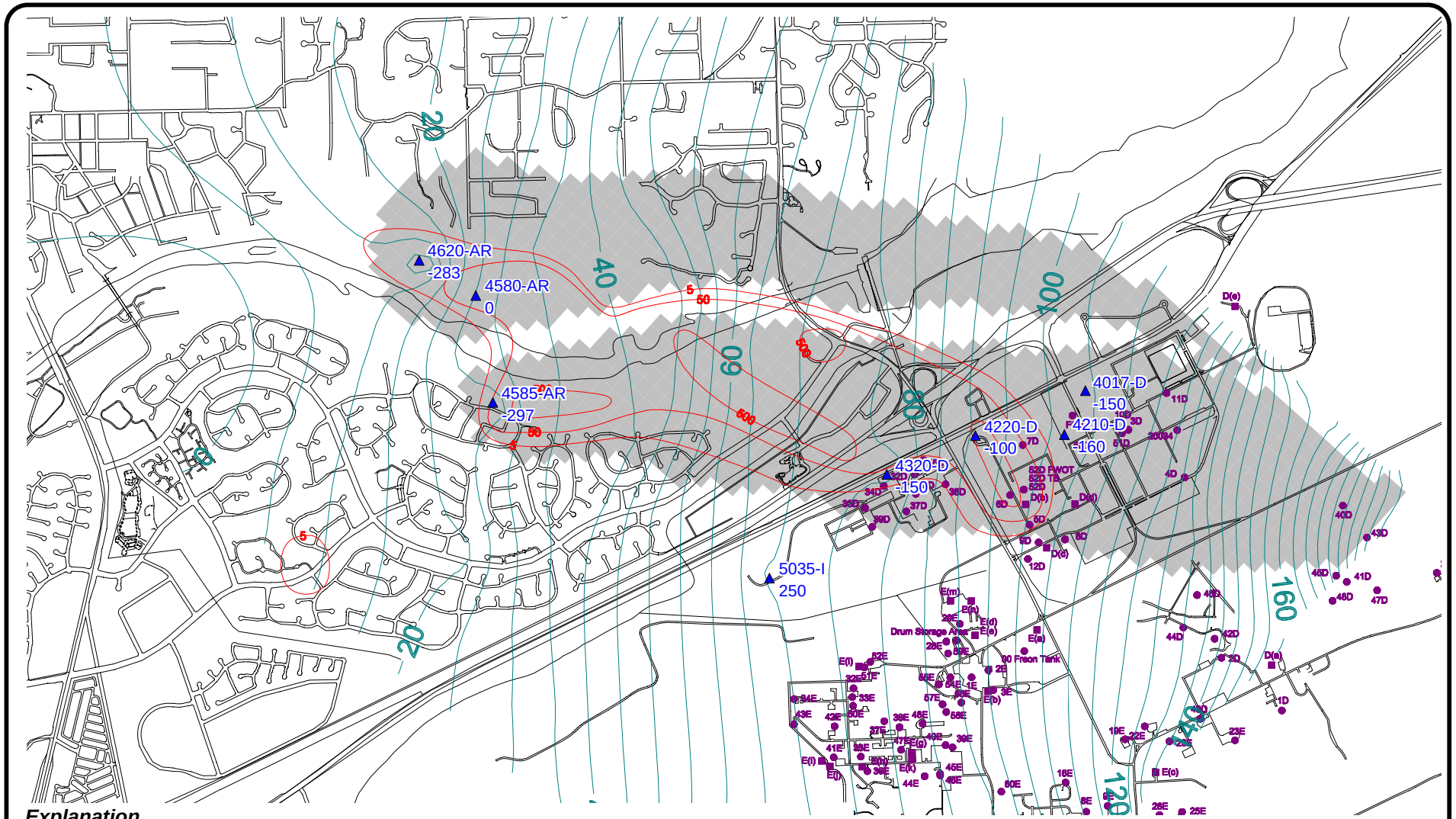
N

0 2,500 5,000
feet

TITLE:	Existing Hydraulic Containment ARGET and GET D, Layer D
LOCATION:	GenCorp Aerojet, Zone 1
CVEI	CENTRAL VALLEY ENVIRONMENTAL, INC.
CHECKED	
DRAFTED	
FILE	
DATE	
FIGURE:	H2-8

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Existing.WOR



Explanation

- ▲ 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- ▼ 5020-I 200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

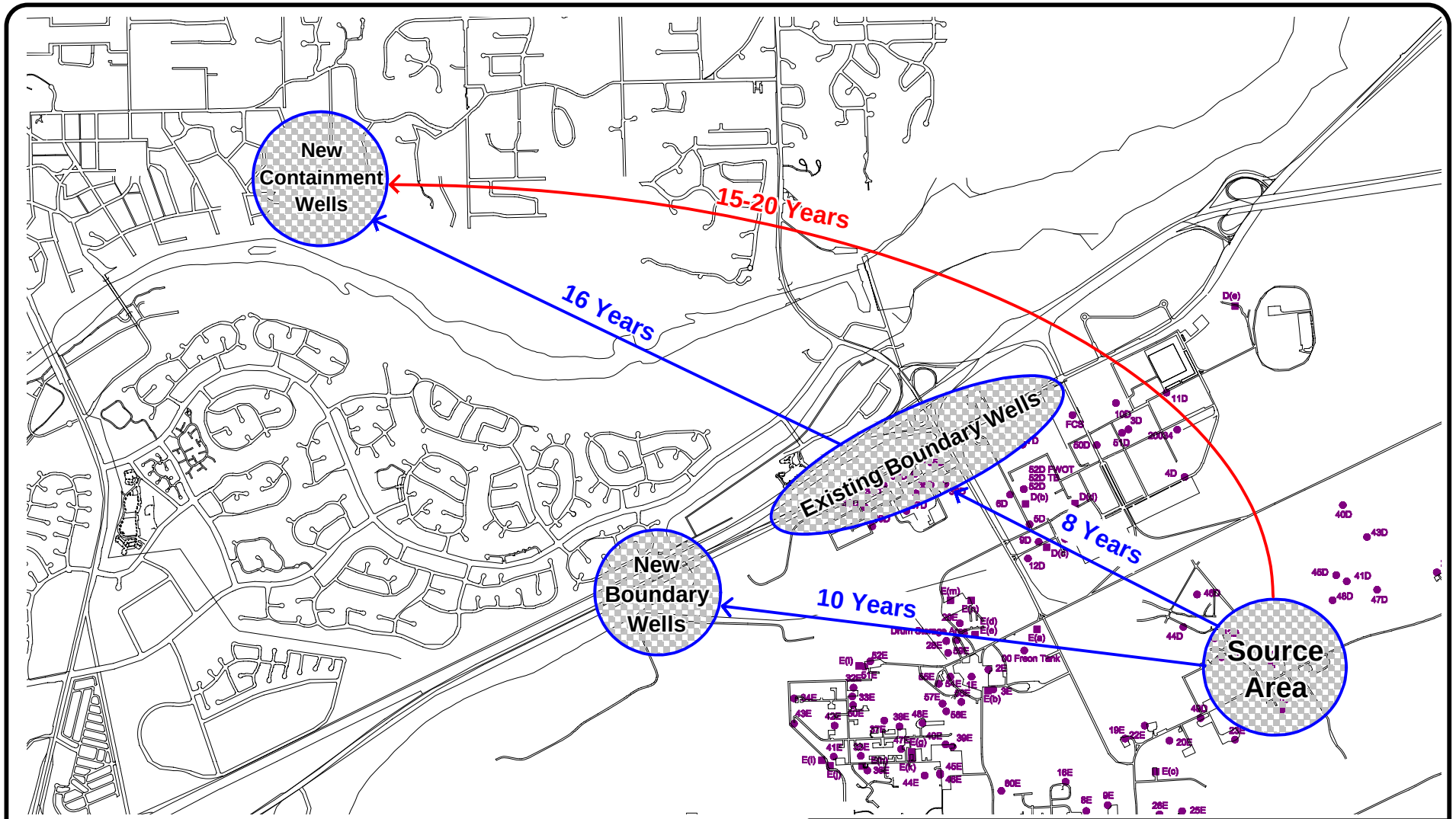
N

0 2,500 5,000
feet

TITLE:	Existing Hydraulic Containment ARGET and GET D, Layer E		
LOCATION:	GenCorp Aerojet, Zone 1		
CVEI	CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED / DRAFTED / FILE / DATE	FIGURE: H2-9

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-TravelTimes.WOR



Explanation

Travel times (in blue) are shown for both layers C and D. Layer E times are shown in red. Travel times, locations, and flow directions are for display only. Stagnation zones are not accounted for in the time estimates.

N

0 2,500 5,000

feet

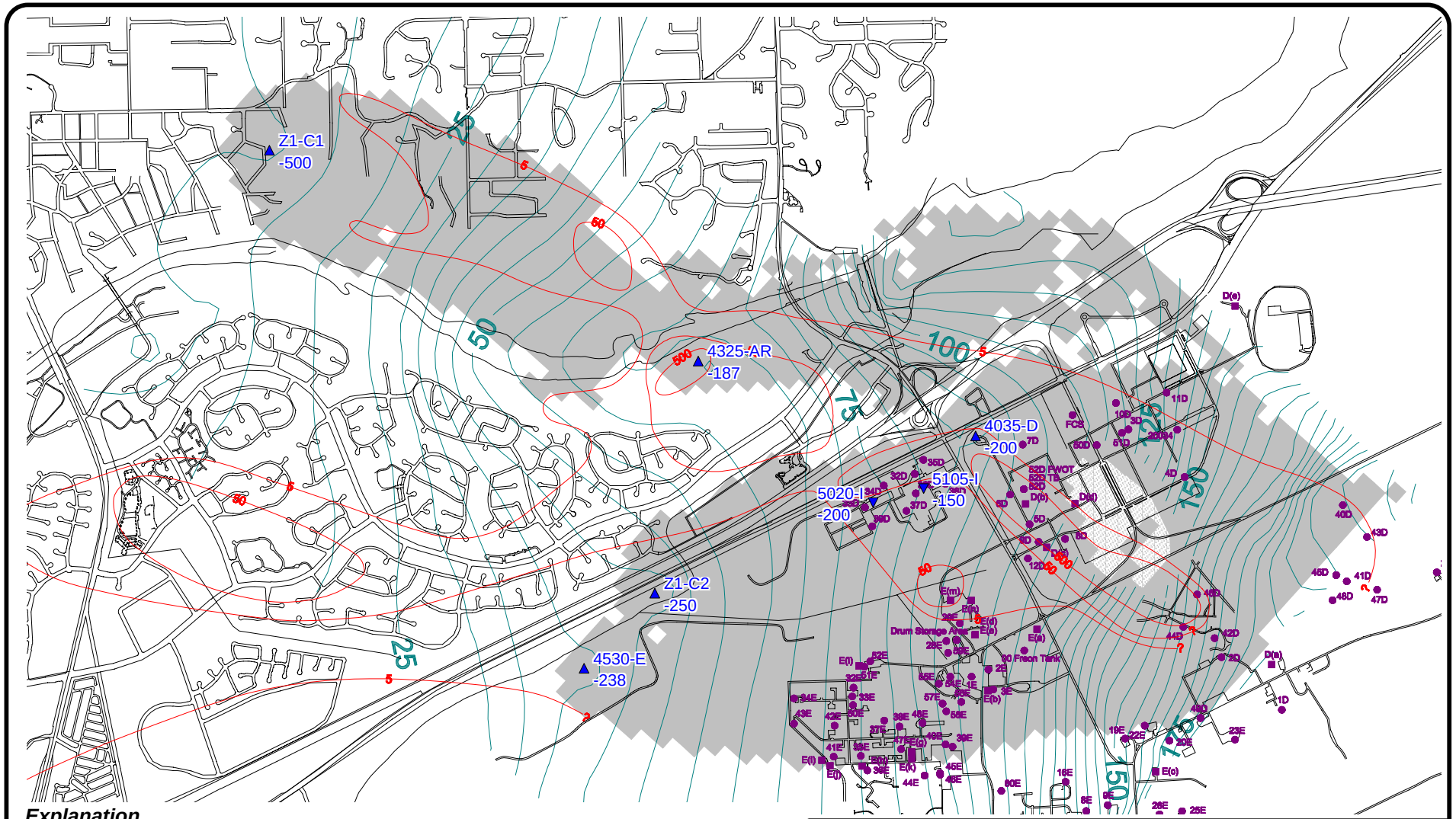
TITLE:	Approximate Travel Times for Zone 1 Remedial Alternatives
LOCATION:	GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		***H2-10***
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt2.WOR



Explanation

- ▲ 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- ▼ 5020-I -200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

TITLE: Remedial Alternative Z1-2 Hydraulic Containment ARGET and GET D, Layer C

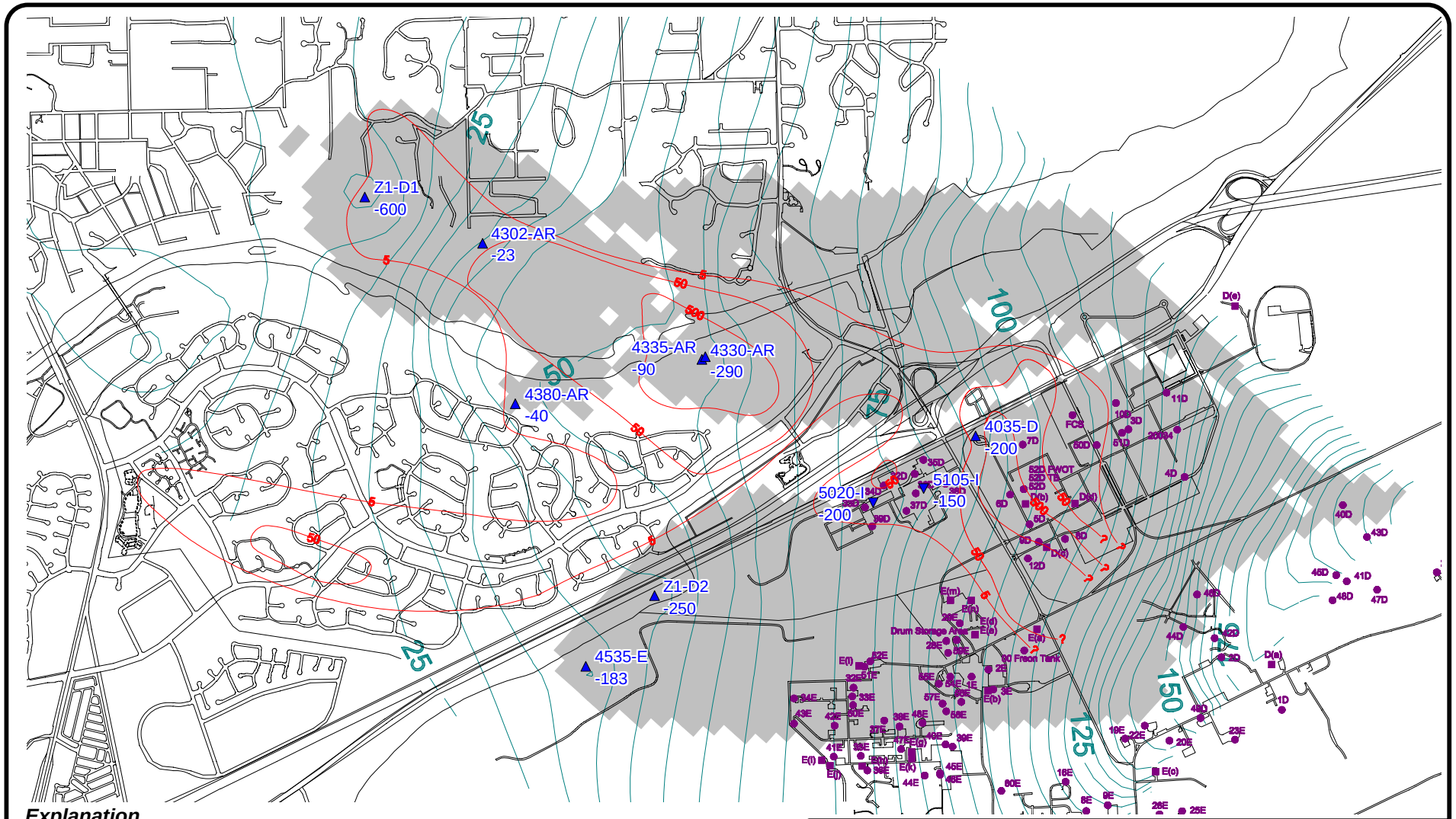
LOCATION: GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-11**
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt2.WOR



Explanation

- ▲ 4585-AR -297 Extraction Well Location, ID, and Rate (gpm)
- ▼ 5020-I -200 Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

TITLE: Remedial Alternative Z1-2 Hydraulic Containment ARGET and GET D, Layer D

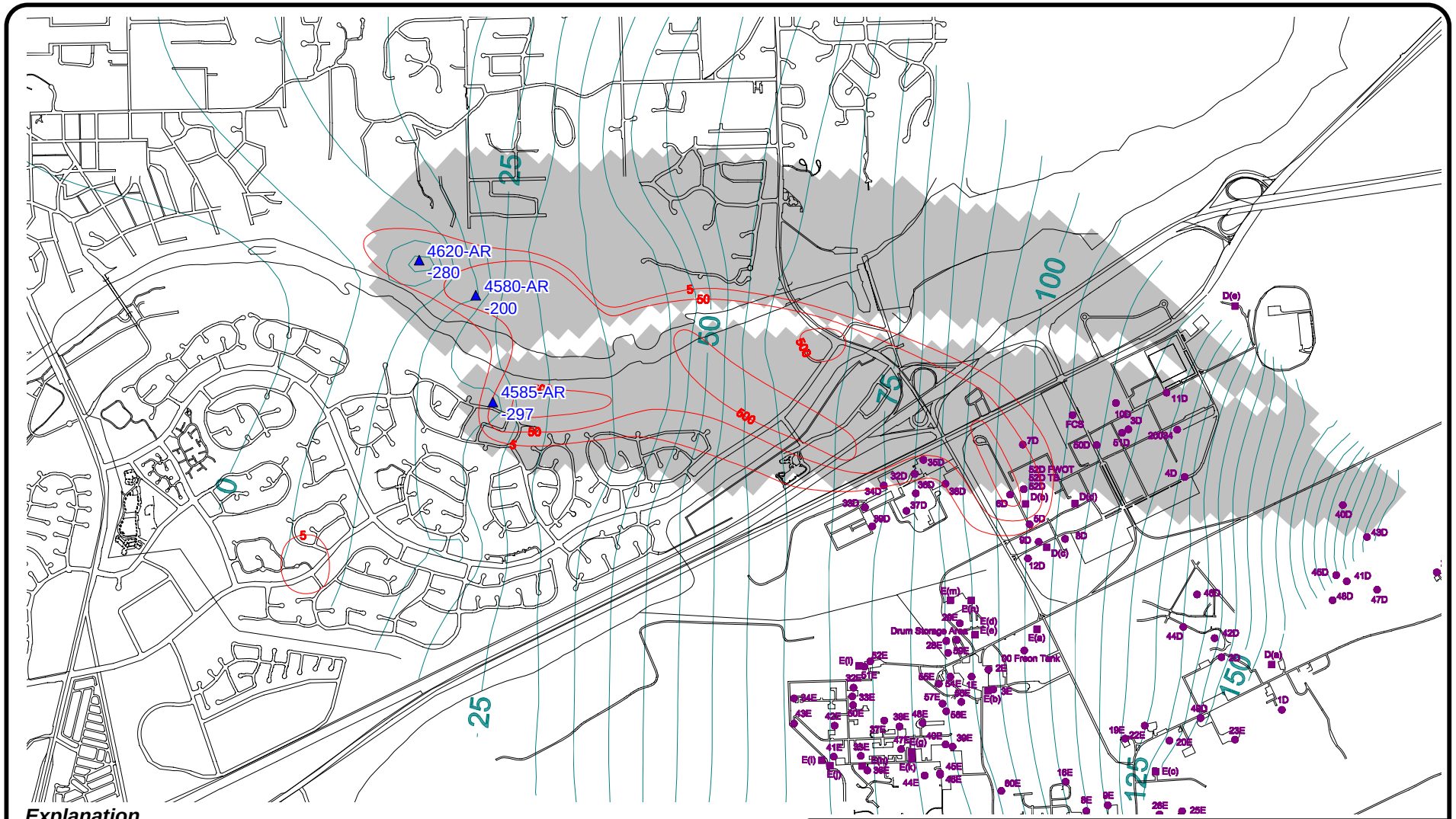
LOCATION: GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-12**
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt2.WOR



Explanation

- 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- 5020-I -200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

TITLE: Remedial Alternative Z1-2 Hydraulic Containment ARGET and GET D, Layer E

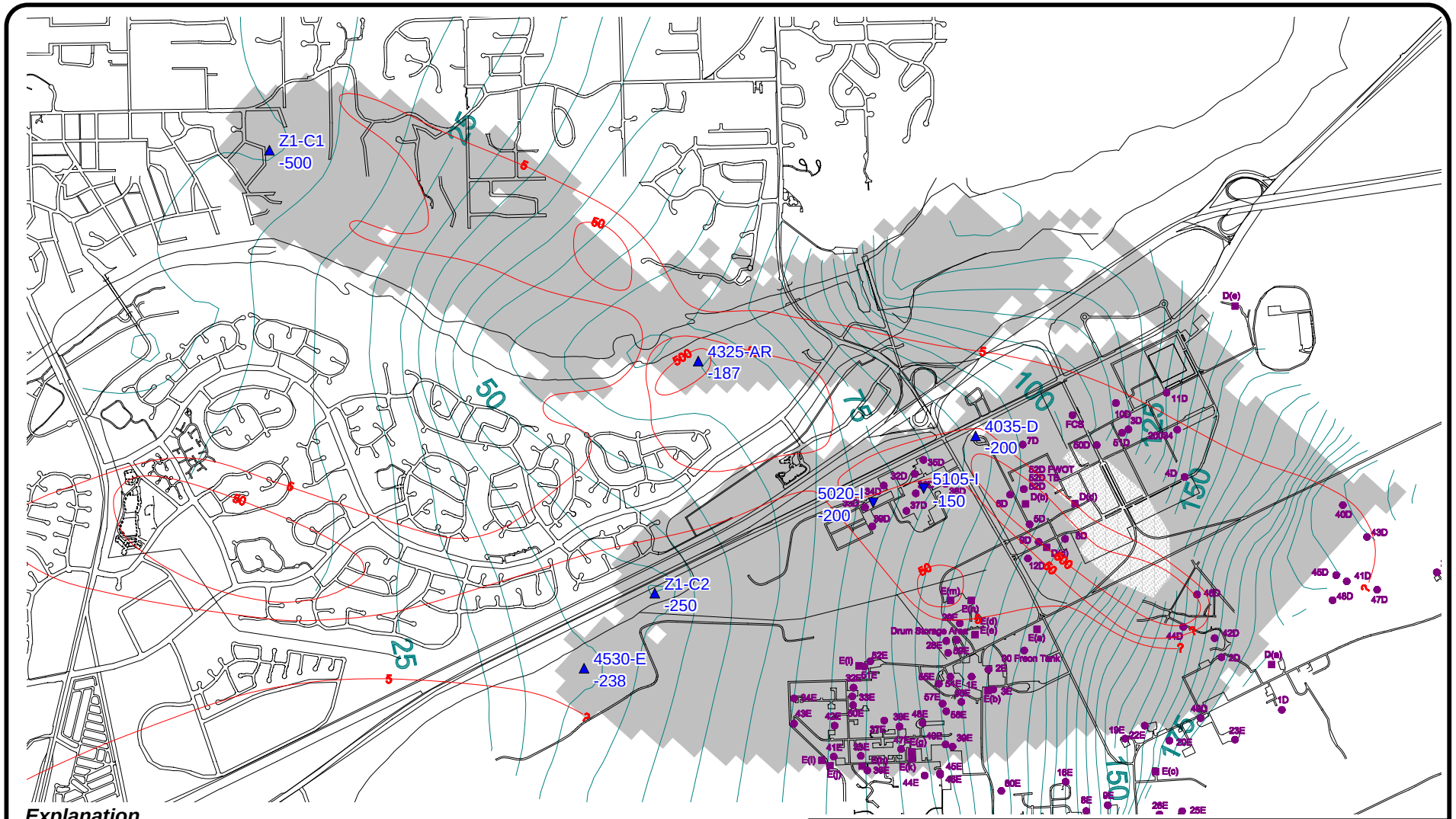
LOCATION: GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-13**
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt3.WOR



Explanation

- ▲ 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- ▼ 5020-I -200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

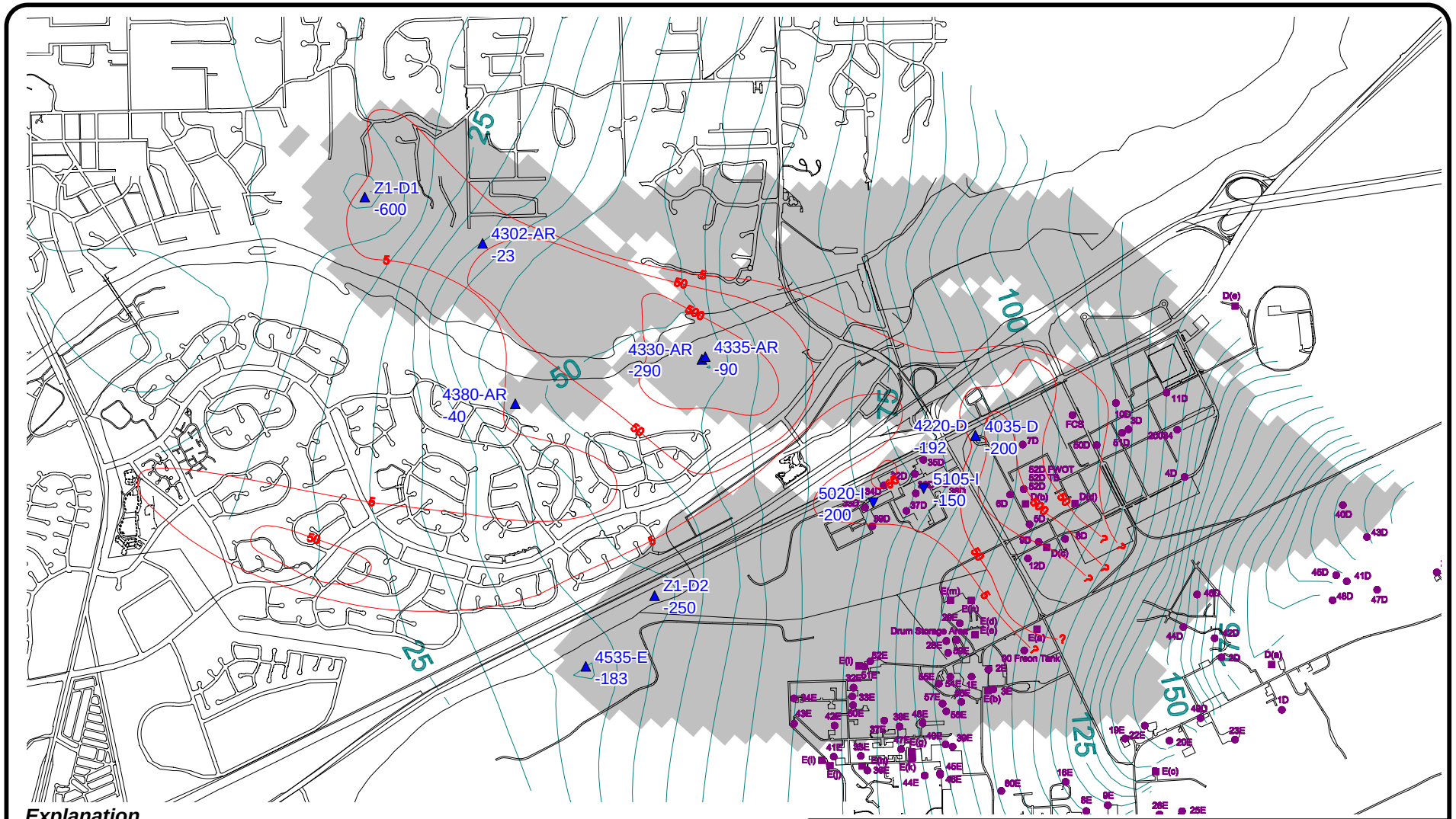
TITLE:	Remedial Alternative Z1-3 Hydraulic Containment ARGET and GET D, Layer C
LOCATION:	GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-14**
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt3.WOR



Explanation

- 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- 5020-I -200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

TITLE: Remedial Alternative Z1-3 Hydraulic Containment ARGET and GET D, Layer D

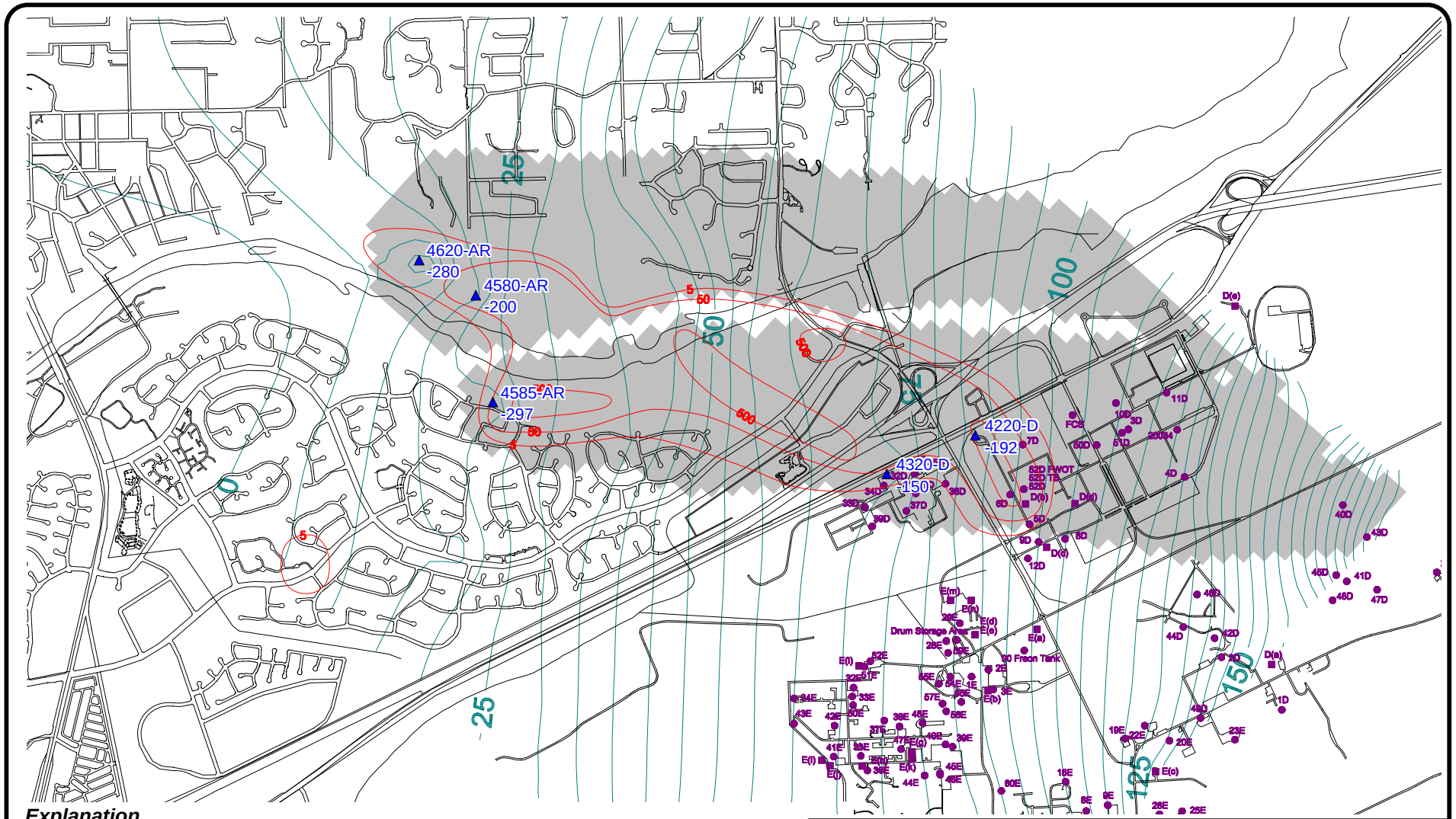
LOCATION: GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		H2-15
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt3.WOR



Explanation

- 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- 5020-I -200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

TITLE: Remedial Alternative Z1-3 Hydraulic Containment ARGET and GET D, Layer E

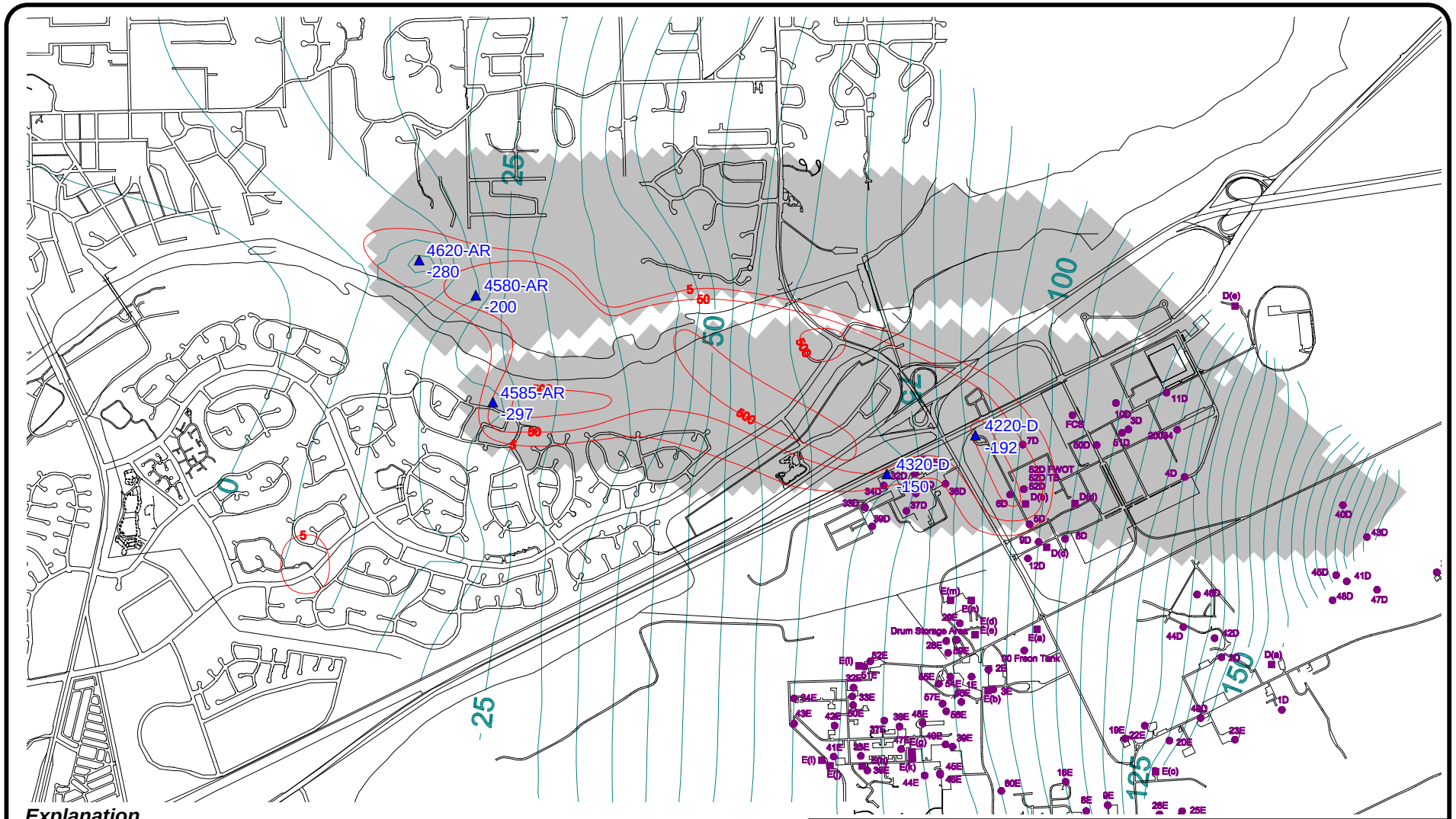
LOCATION: GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-16**
FILE		
DATE		

SR10114570

C:\AEROJET\ZONE 1\GIS\Z1-Alt3.WOR



Explanation

- 4585-AR -297 — Extraction Well Location, ID, and Rate (gpm)
- 5020-I -200 — Recharge Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Maximum Extent of Impacts (TCE concentration posted in µg/L)
- Computed Water Levels (ft. msl)
- Model Generated Dry Area

N

0 2,500 5,000
feet

Note: Only wells operating in this layer and alternative are shown. Recharge well rates posted are extraction rates.

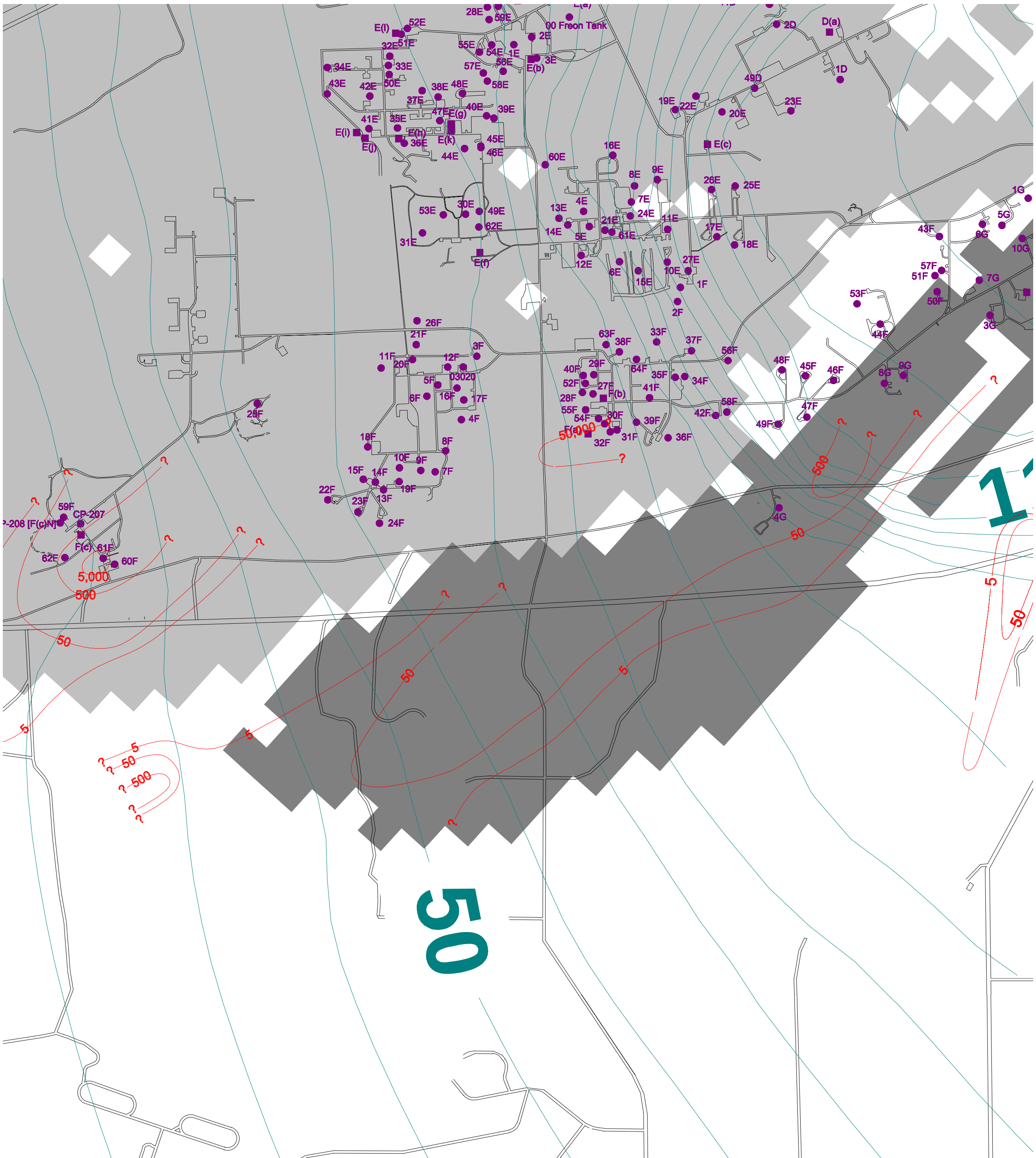
TITLE: Remedial Alternative Z1-3 Hydraulic Containment ARGET and GET D, Layer E

LOCATION: GenCorp Aerojet, Zone 1

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H2-16**
FILE		
DATE		

SR10114570



Explanation

Model Generated Containment Area

Containment Area for GET E/F

Maximum Extent of Impacts (TCE concentrations are shown in µg/L)

Computed Water Levels (ft. msl)

Note: Containment for Layer B is due to downward migration to Layer C extraction wells.

N

0 2,500 5,000

feet

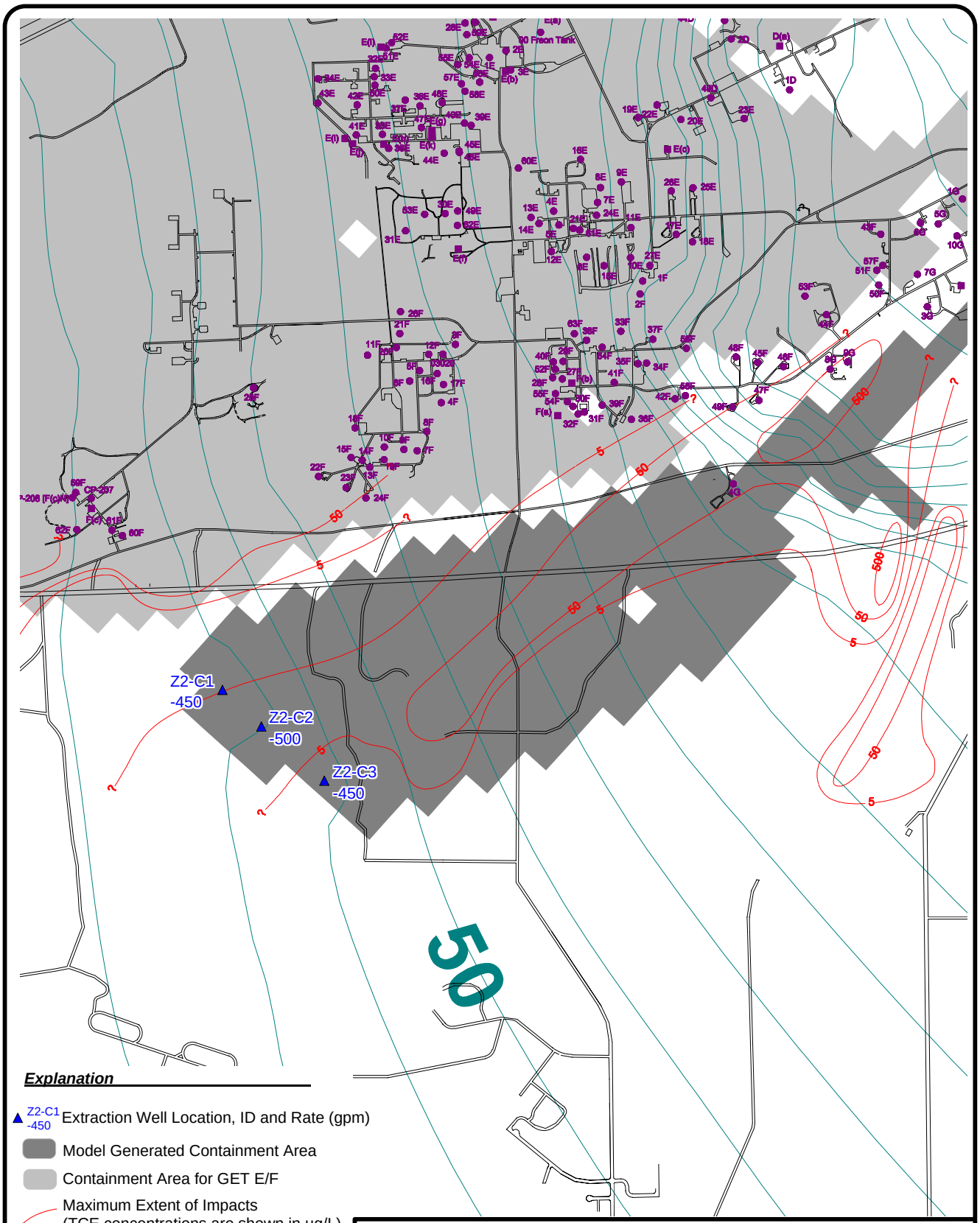
TITLE: Remedial Alternative Z2-2 Hydraulic Containment GET G, Layer B

LOCATION: GenCorp Aerojet, Zone 2

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		H3-1
FILE		
DATE		

C:\AEROJET\ZONE 2\GIS\Z2-Alt2.WOR



Explanation

- Z2-C1 -450 Extraction Well Location, ID and Rate (gpm)
- Model Generated Containment Area
- Containment Area for GET E/F
- Maximum Extent of Impacts (TCE concentrations are shown in µg/L)
- Computed Water Levels (ft. msl)

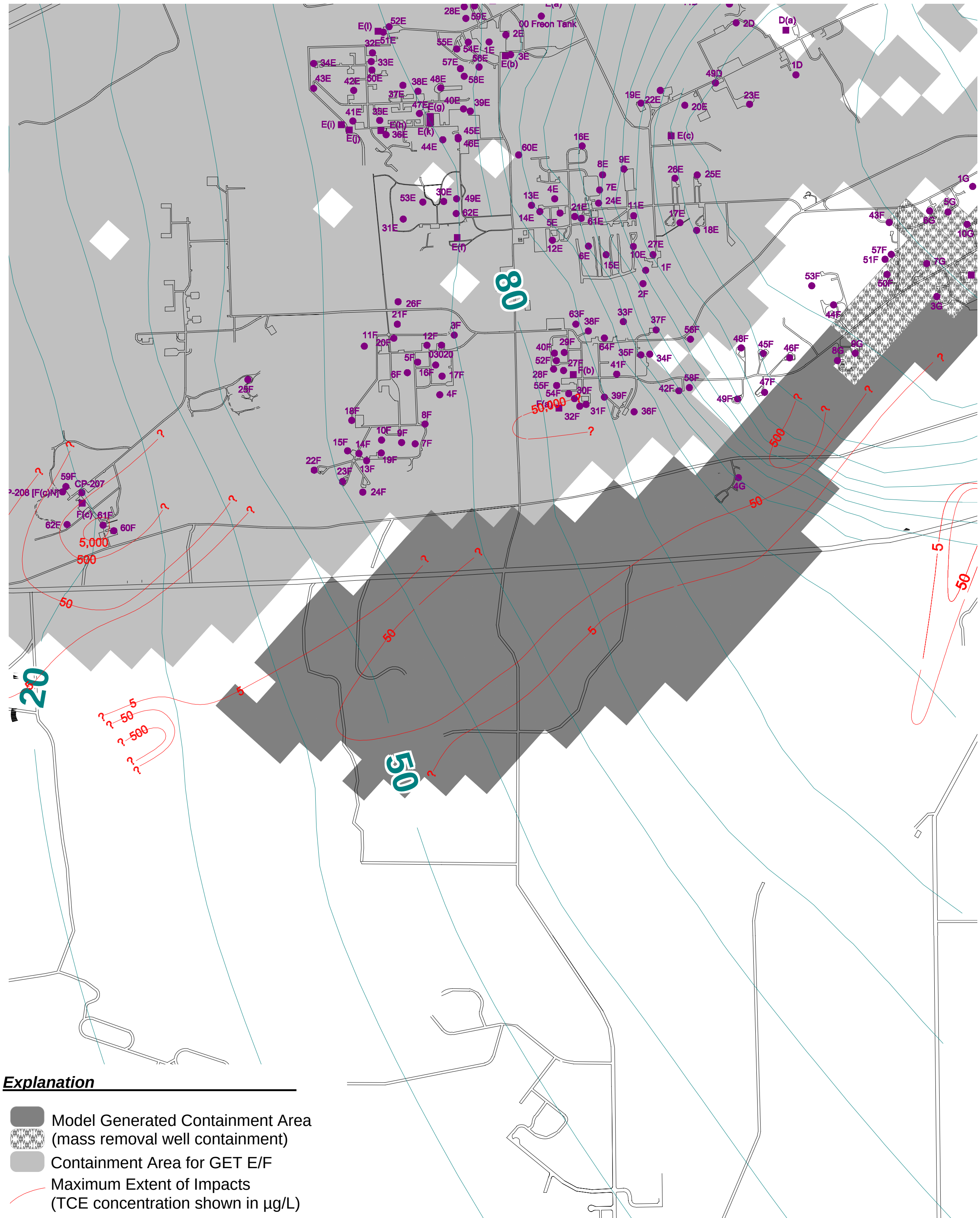
N

0 2,500 5,000
feet

TITLE:	Remedial Alternative Z2-2 Hydraulic Containment GET G, Layer C		
LOCATION:	GenCorp Aerojet, Zone 2		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H3-2**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 2\GIS\Z2-Alt2.WOR

SR10114570



Explanation

- Model Generated Containment Area (mass removal well containment)
- Containment Area for GET E/F
- Maximum Extent of Impacts (TCE concentration shown in µg/L)
- Computed Water Levels (ft. msl)

Note: Containment in Layer B is due to downward migration to Layer C extraction wells.

N

0 2,500 5,000
feet

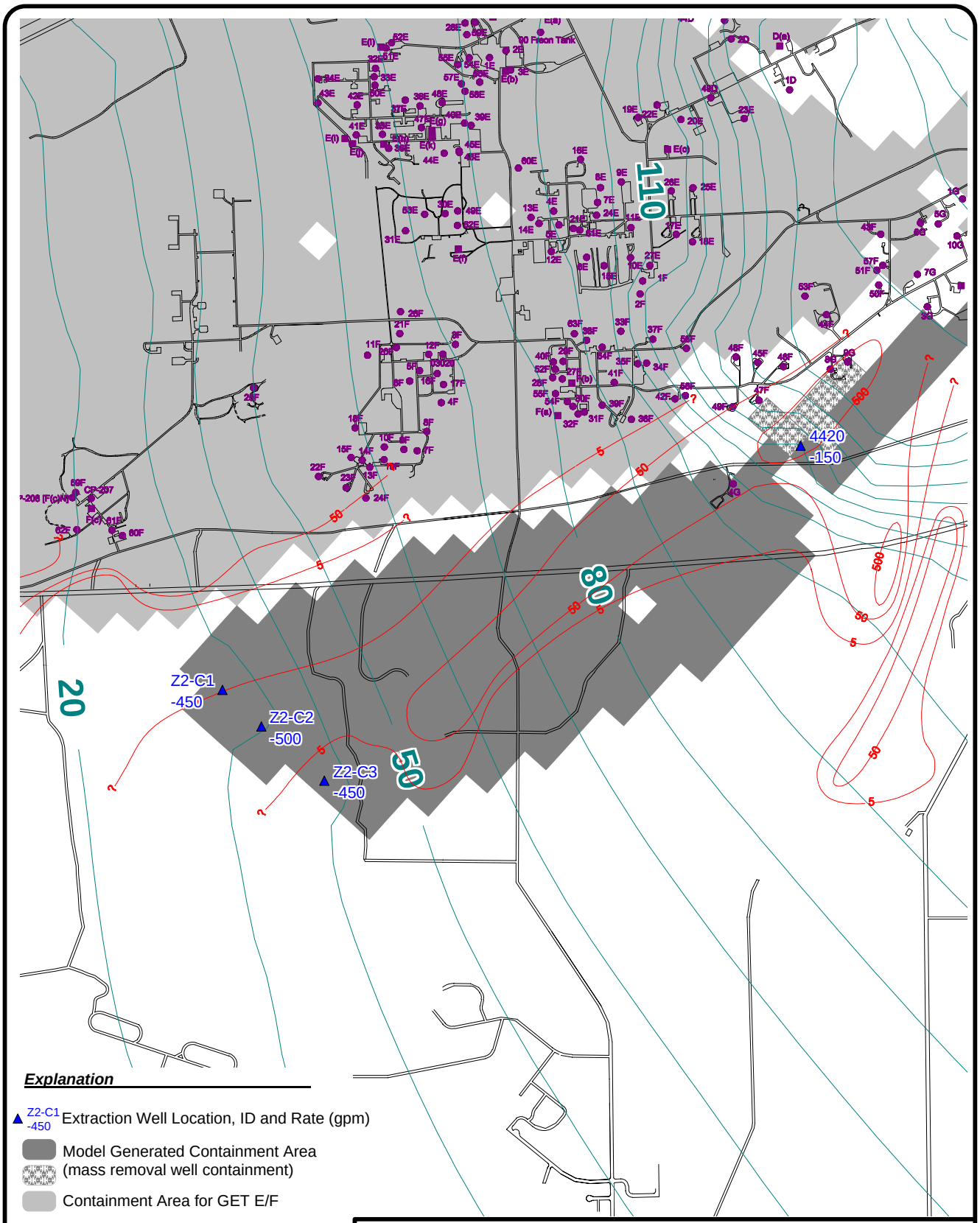
TITLE: Remedial Alternative Z2-3 Hydraulic Containment GET G, Layer B

LOCATION: GenCorp Aerojet, Zone 2

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H3-3**
FILE		
DATE		

C:\AEROJET\ZONE 2\GIS\Z2-Alt3.WOR



Explanation

- Z2-C1 -450 Extraction Well Location, ID and Rate (gpm)
- Model Generated Containment Area (mass removal well containment)
- Containment Area for GET E/F
- Approximate Extent of Impacts
- Computed Water Levels (ft. msl)

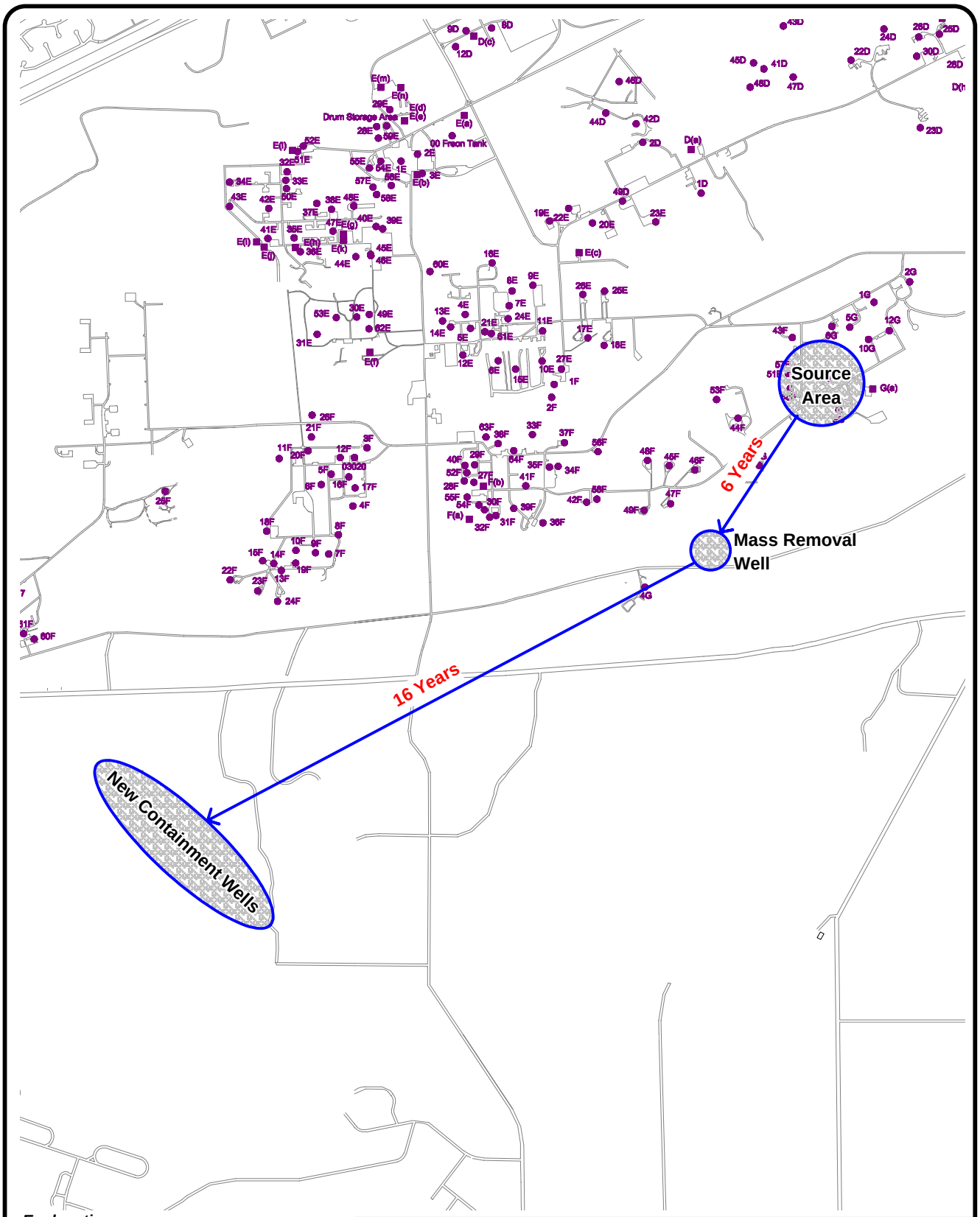
N

0 2,500 5,000
feet

TITLE: Remedial Alternative Z2-3 Hydraulic Containment GET G, Layer C			
LOCATION: GenCorp Aerojet, Zone 2			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H3-4**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 2\GIS\Z2-Alt3.WOR

SR10114570



Explanation

Travel times shown are for both layers B and C. Travel times, locations, and flow directions are approximate.

N

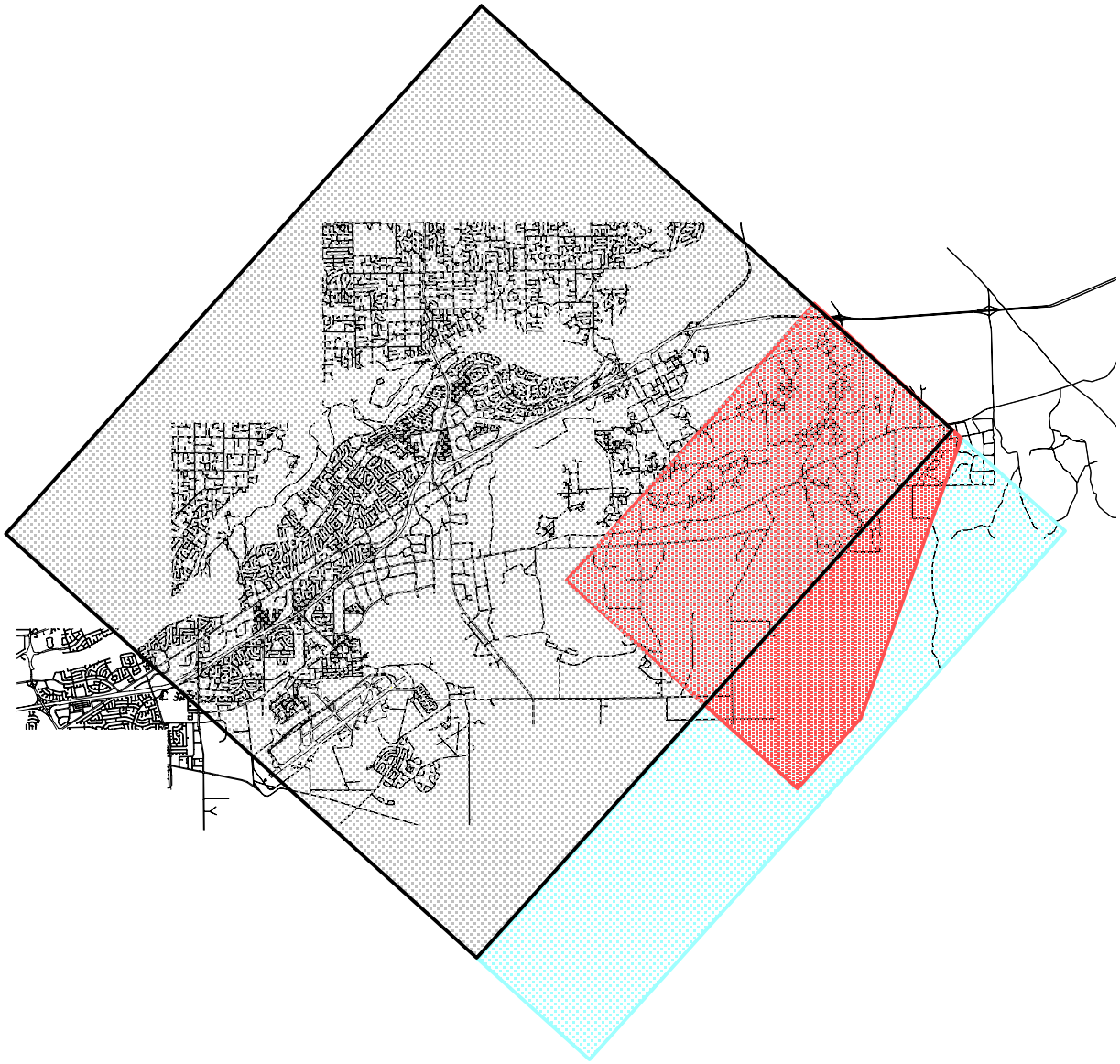
0 2,500 5,000

feet

TITLE:	Approximate Travel Times for Zone 2 Remedial Alternatives		
LOCATION:	GenCorp Aerojet, Zone 2		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H3-5**
	FILE		
	DATE		

C:\AEROJET\ZONE 2\GIS\Z2-TravelTimes.WOR

SR10114570



Explanation

Original Regional Model Grid

Expanded Regional Model Grid Area

Zone 3 Model Subregional Area

Note: North is towards the top of the page.

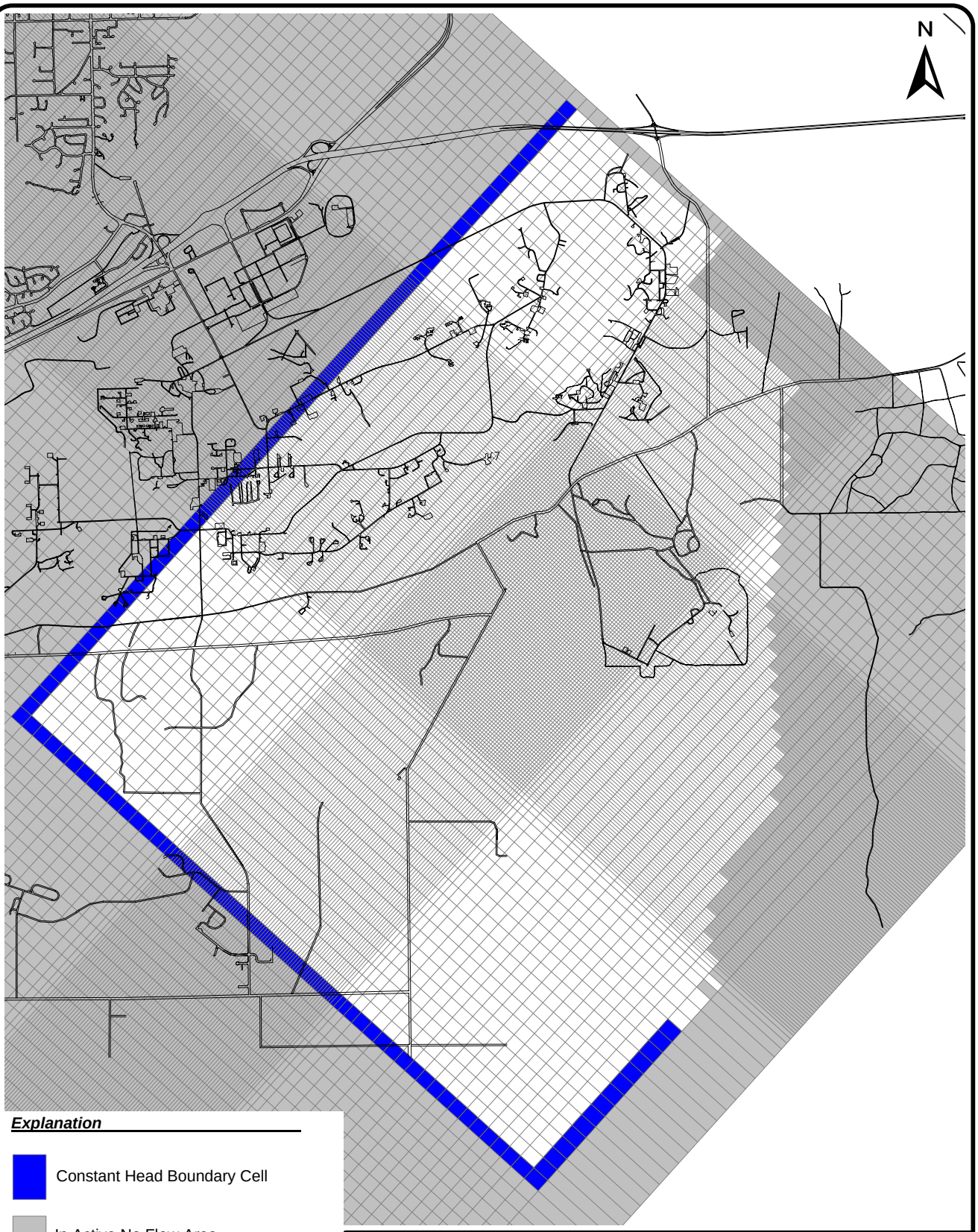
0 14,000 28,000

feet

TITLE:	Subregional Model Delineation		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-1**
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Grids.WOR

SR10114570



Explanation

Constant Head Boundary Cell

In Active No Flow Area

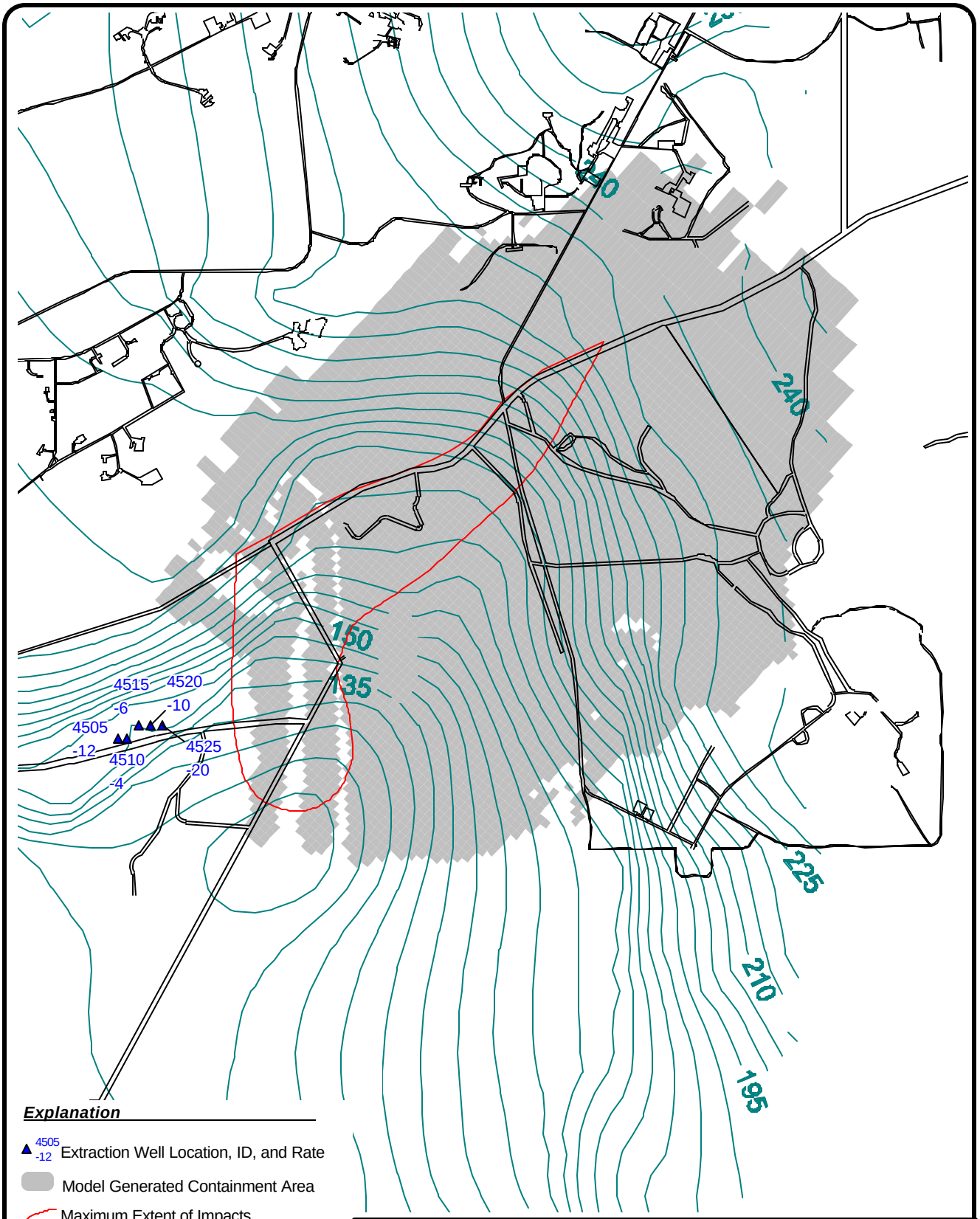
0 2,000 4,000

feet

TITLE:	Subregional Model Grid		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-2**
	FILE		
	DATE		

C:\AEROJET\ZONE 3\Grids.WOR

SR10114570



Explanation

- 4505 / -12 Extraction Well Location, ID, and Rate
- Model Generated Containment Area
- Maximum Extent of Impacts
- Computed Water Levels (ft. msl)

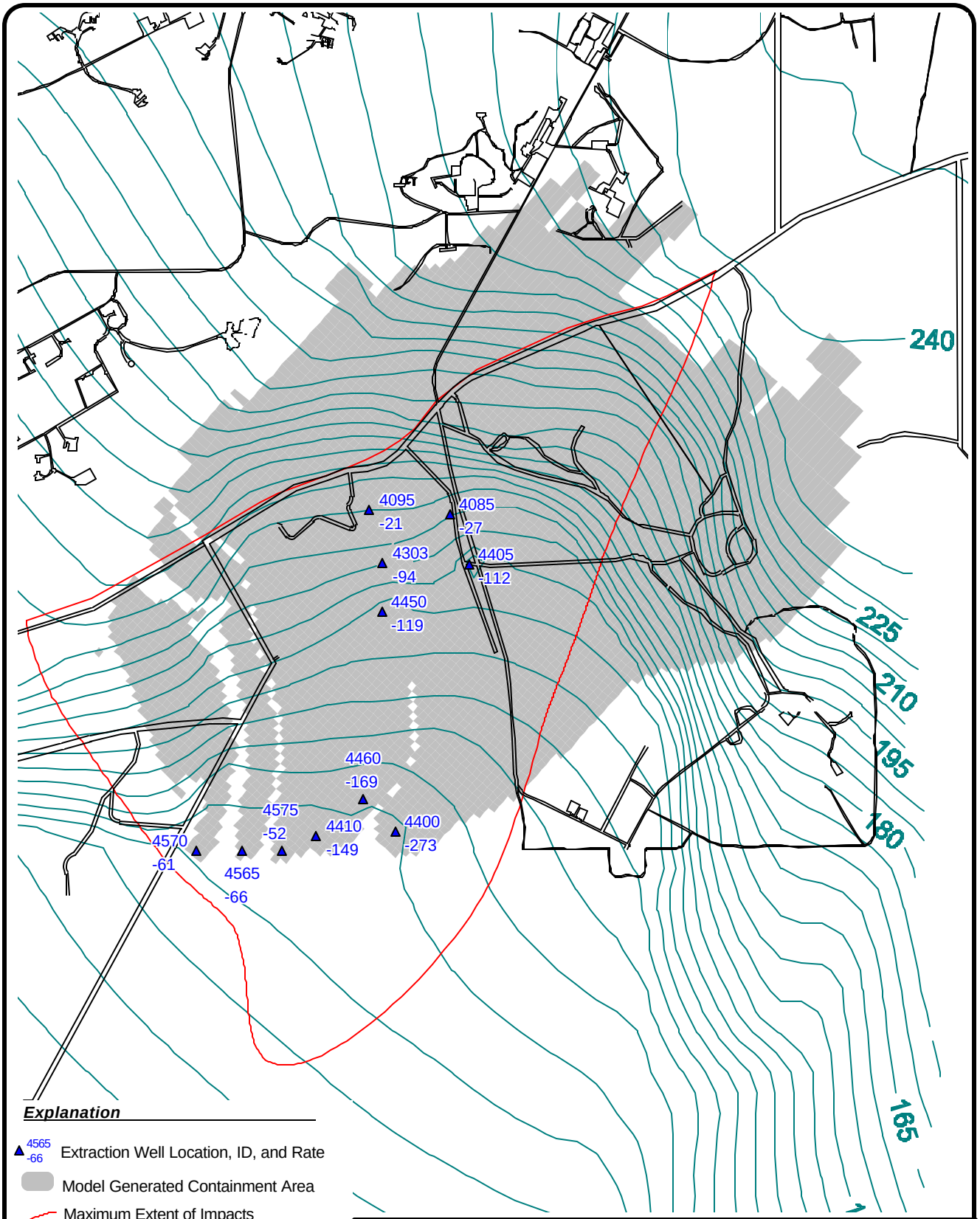
Note: Only wells operating in this layer are shown.

0 2,000 4,000
feet

TITLE:	Existing Hydraulic Containment GET B, Layer B		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-3**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-All1.WOR

SR10114570



Explanation

4565 -66 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

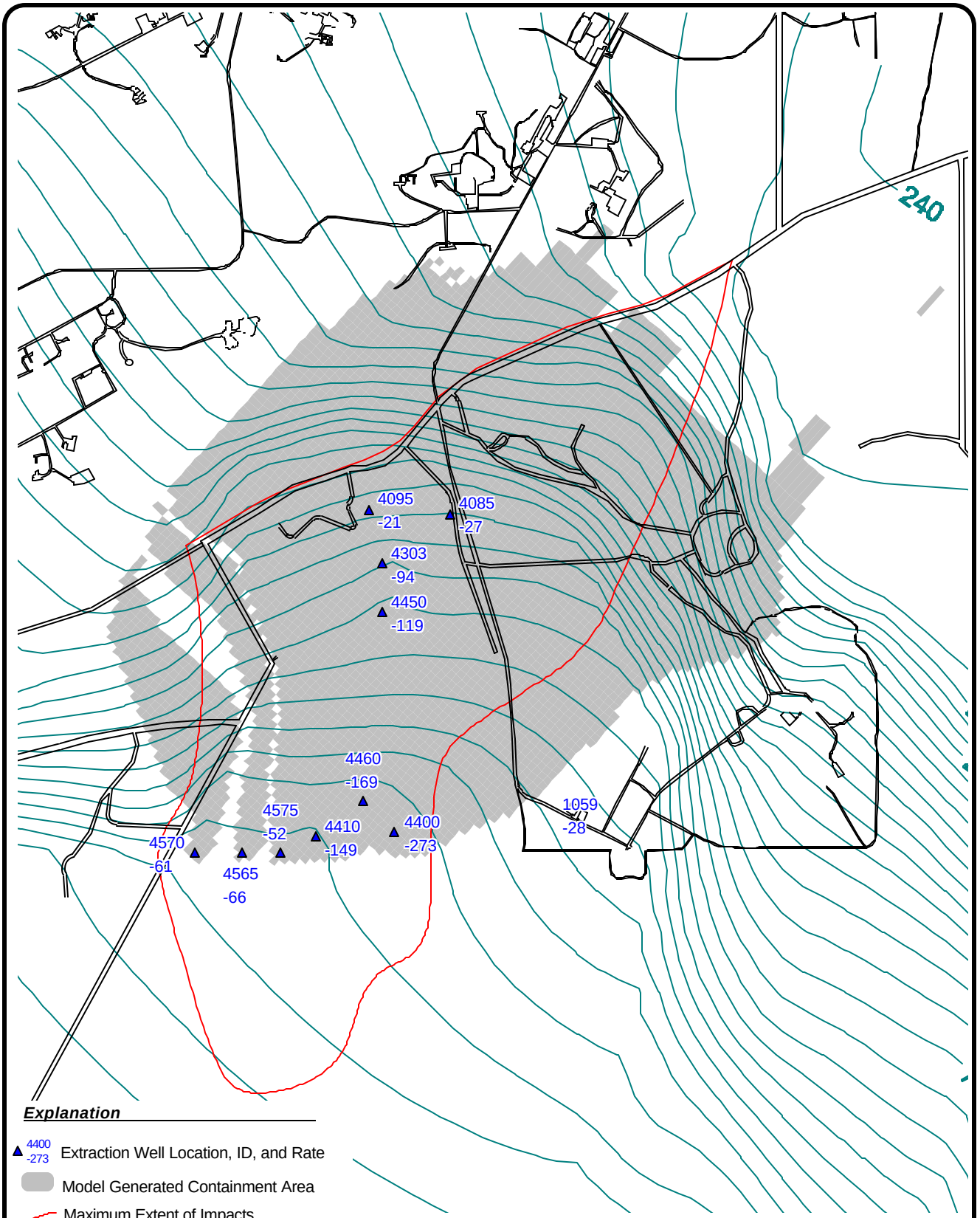
0 2,000 4,000

feet

TITLE:	Existing Hydraulic Containment GET B, Layer C		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-4**
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-All1.WOR

SR10114570



Explanation

4400 -273 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

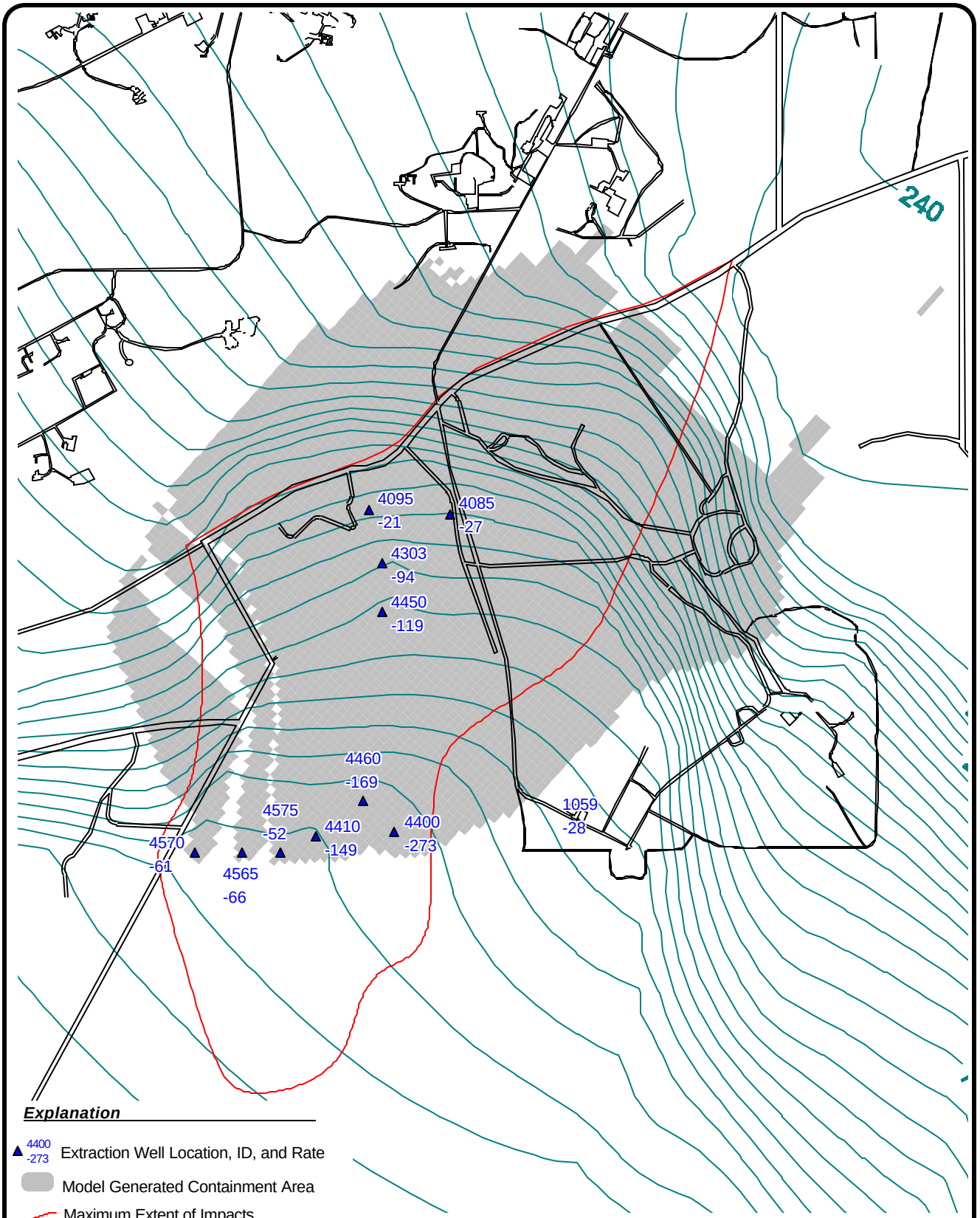
0 2,000 4,000

feet

TITLE:	Existing Hydraulic Containment GET B, Layer D		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-5**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-All1.WOR

SR10114570



Explanation

4400 -273 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

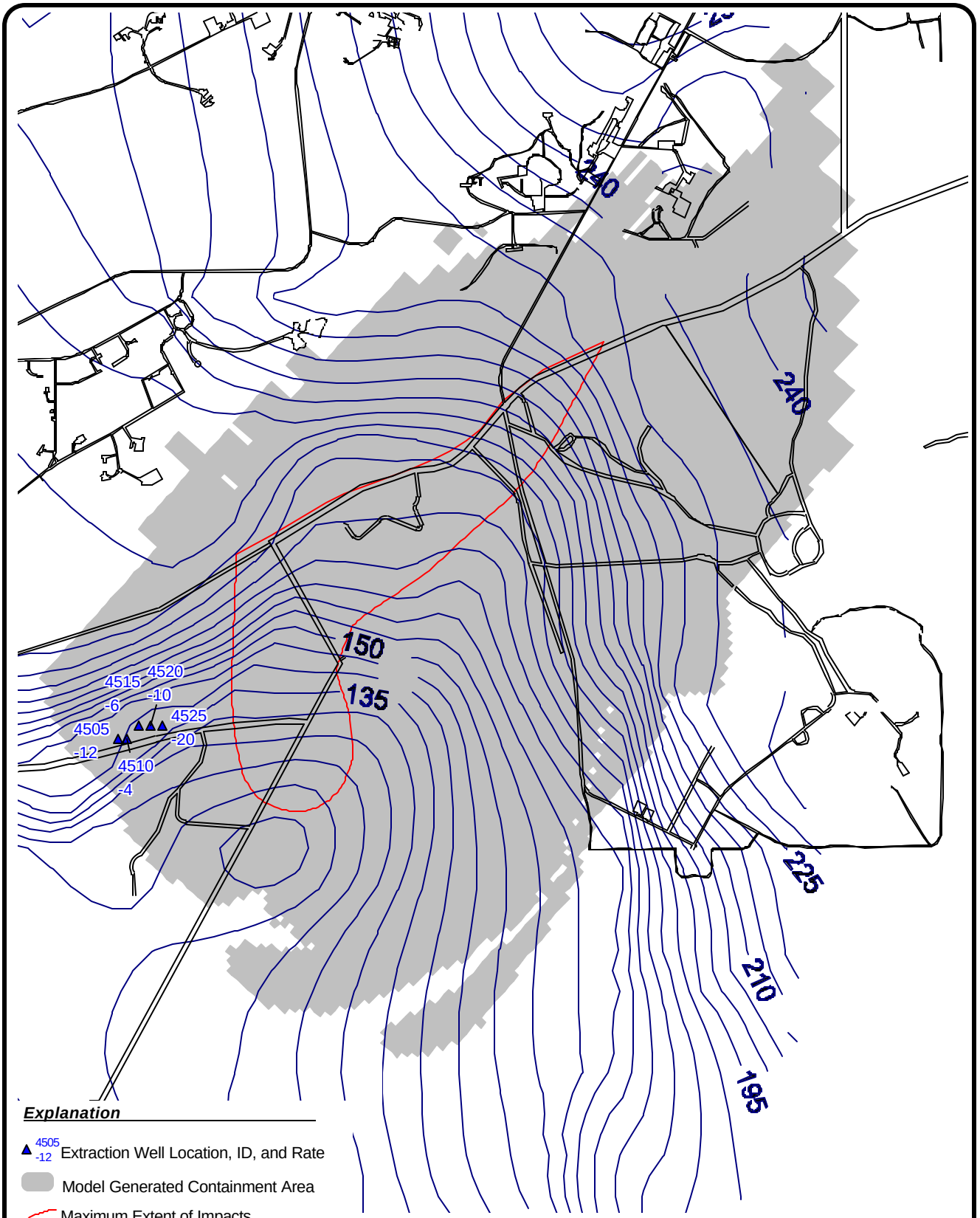
0 2,000 4,000

feet

TITLE:	Existing Hydraulic Containment GET B, Layer D		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-5**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-All1.WOR

SR10114570



Explanation

4505 -12 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

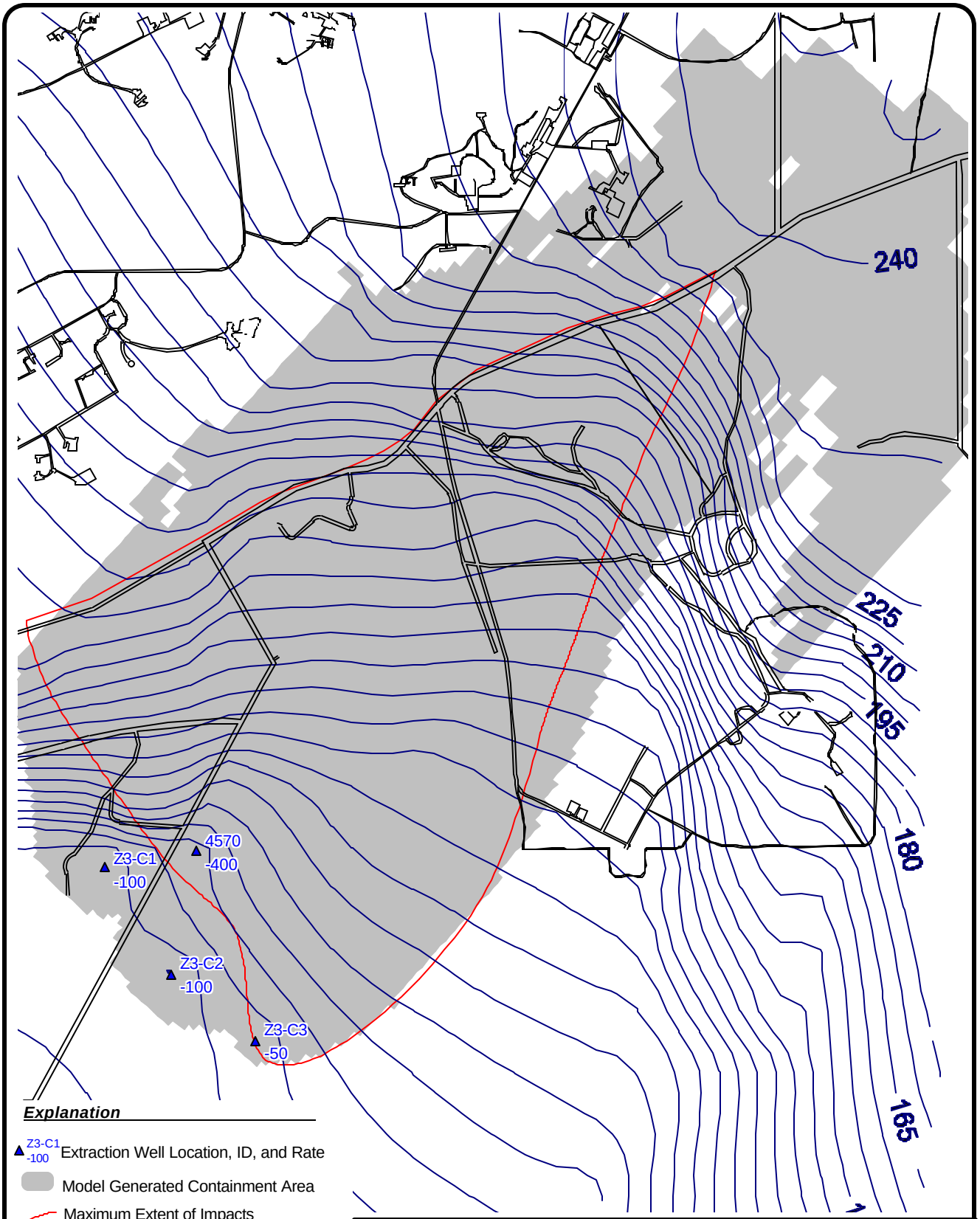
0 2,000 4,000

feet

TITLE: Remedial Alternative Z3-2 Hydraulic Containment GET B, Layer B			
LOCATION: GenCorp Aerojet, Zone 3			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-6**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-All2.WOR

SR10114570



Explanation

Z3-C1 -100 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

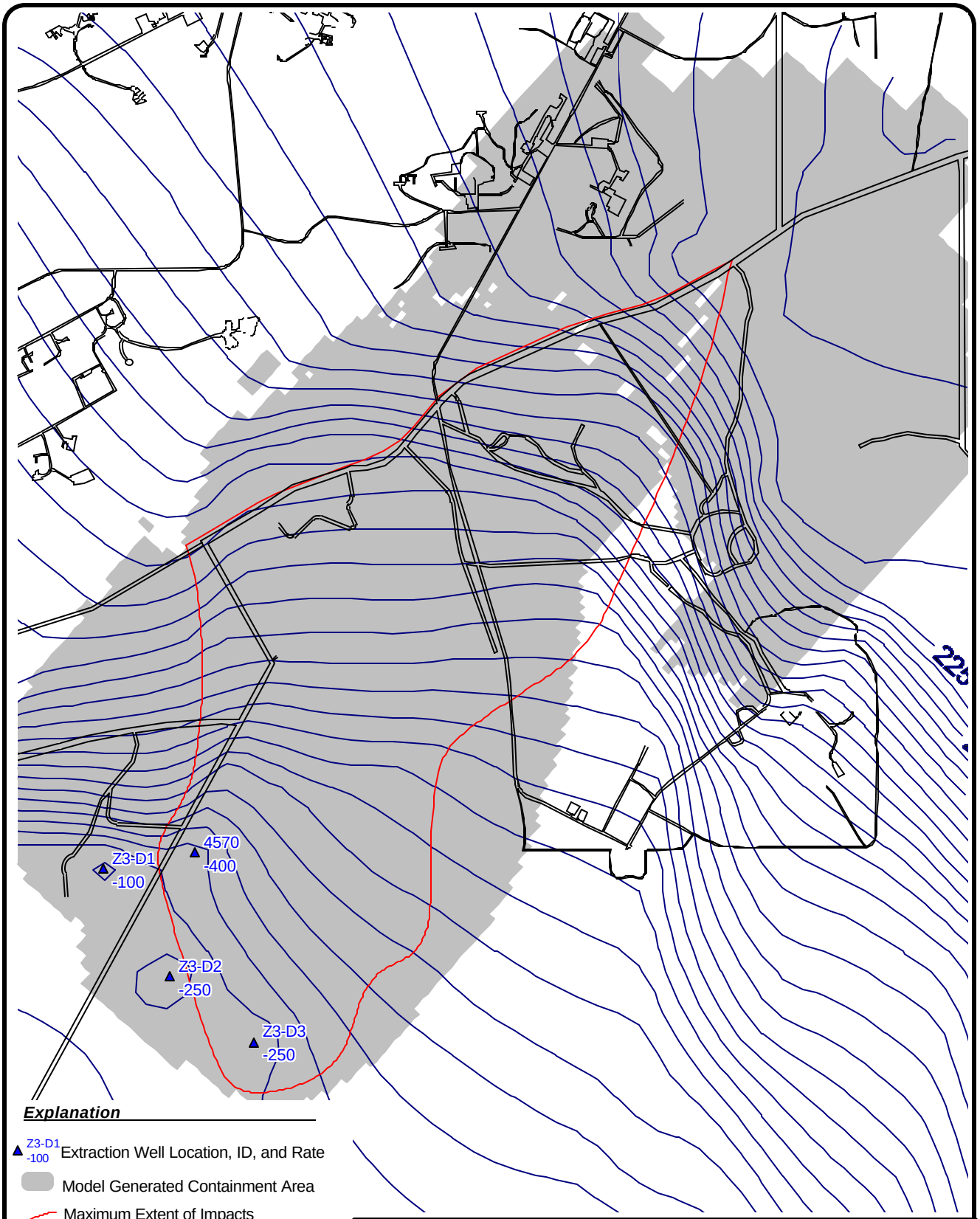
0 2,000 4,000

feet

C:\AEROJET\ZONE 3\GIS\Z3-All2.WOR

TITLE: Remedial Alternative Z3-2 Hydraulic Containment GET B, Layer C			
LOCATION: GenCorp Aerojet, Zone 3			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-7**
	FILE		
	DATE		

SR10114570



Explanation

Z3-D1 -100 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

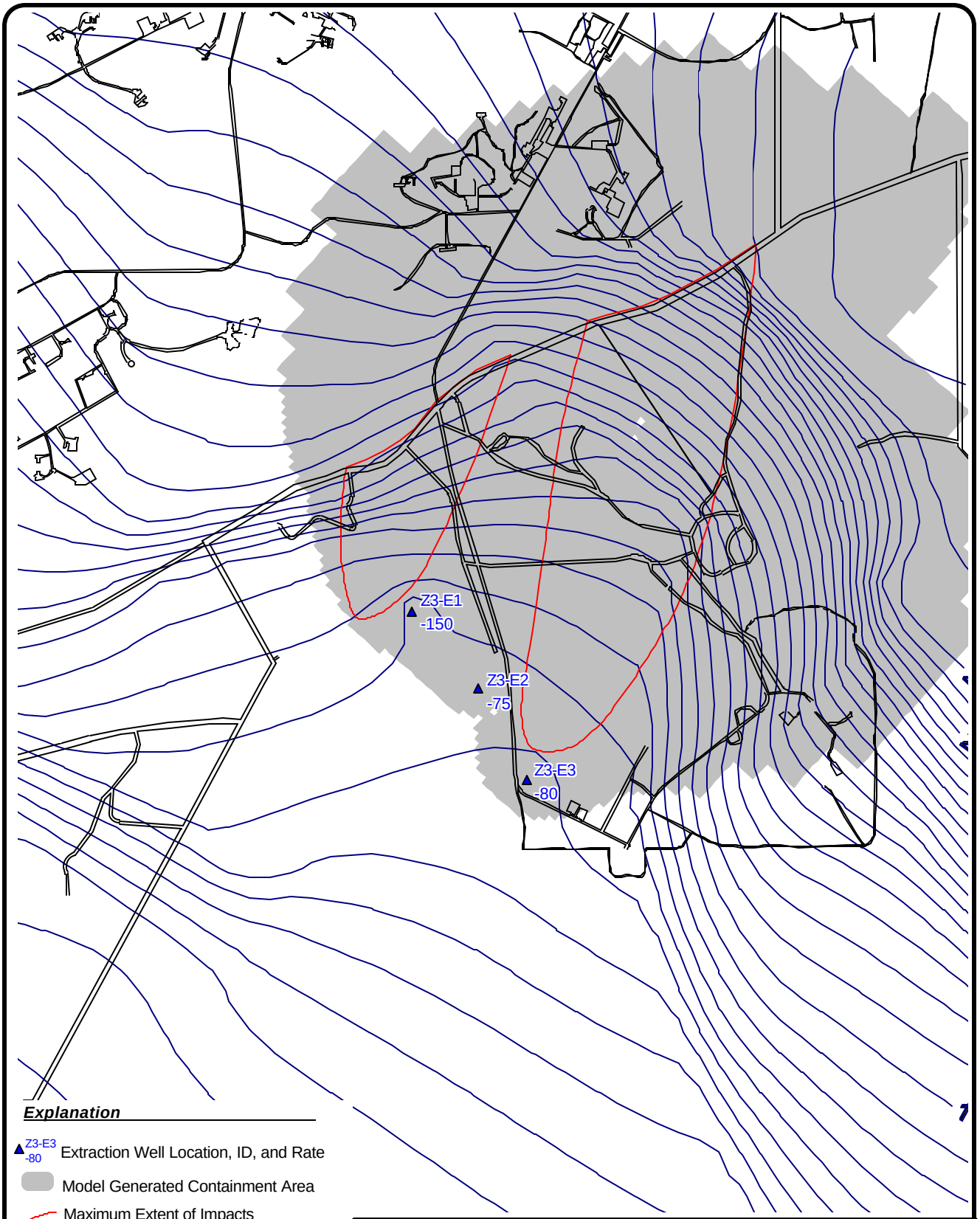
0 2,000 4,000

feet

TITLE: Remedial Alternative Z3-2 Hydraulic Containment GET B, Layer D			
LOCATION: GenCorp Aerojet, Zone 3			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-8**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-Alt2.WOR

SR10114570



Explanation

Z3-E3 -80 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

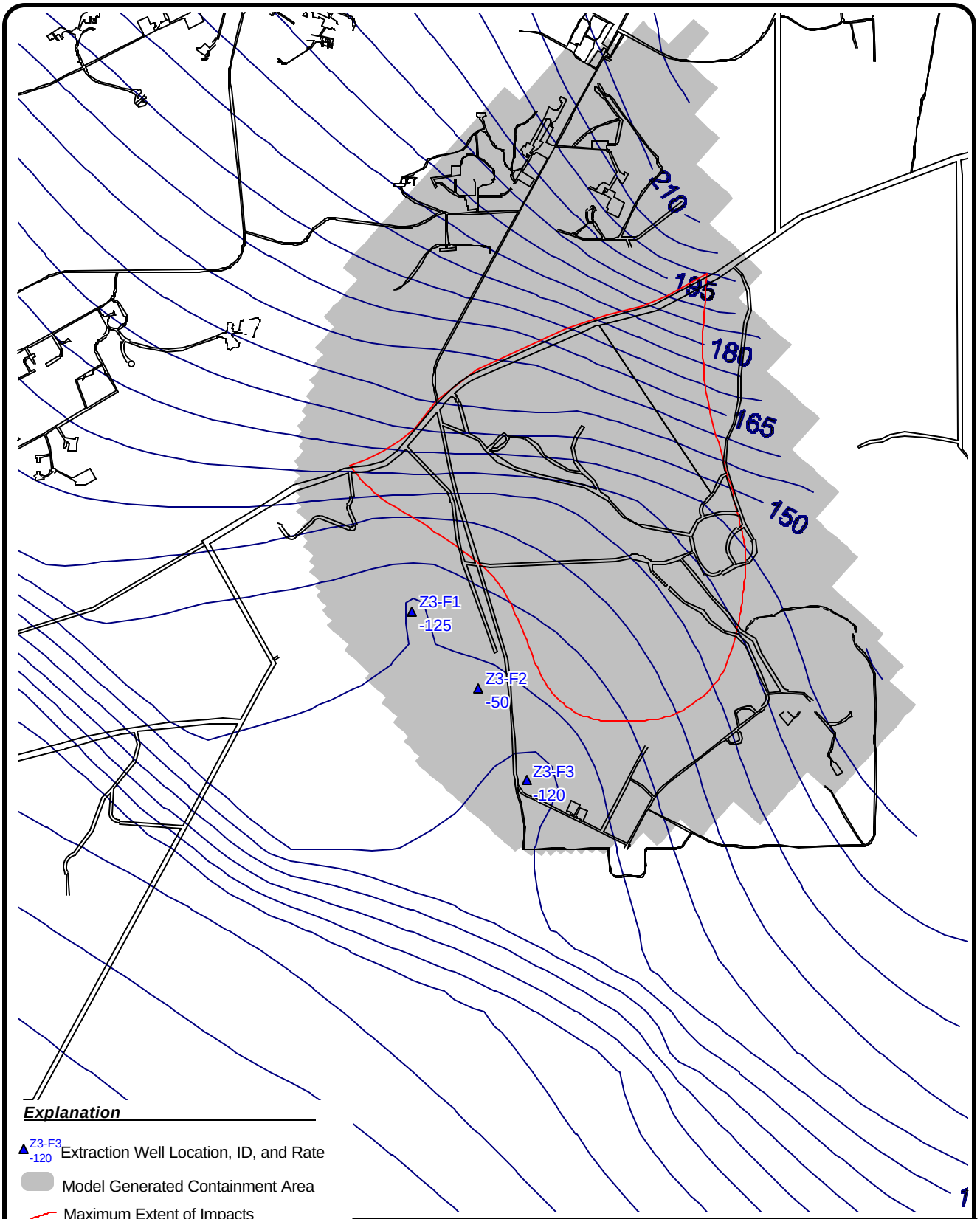
0 2,000 4,000

feet

TITLE: Remedial Alternative Z3-2 Hydraulic Containment GET B, Layer E			
LOCATION: GenCorp Aerojet, Zone 3			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-9**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-Alt2.WOR

SR10114570



Explanation

Z3-F3 -120 Extraction Well Location, ID, and Rate

Model Generated Containment Area

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

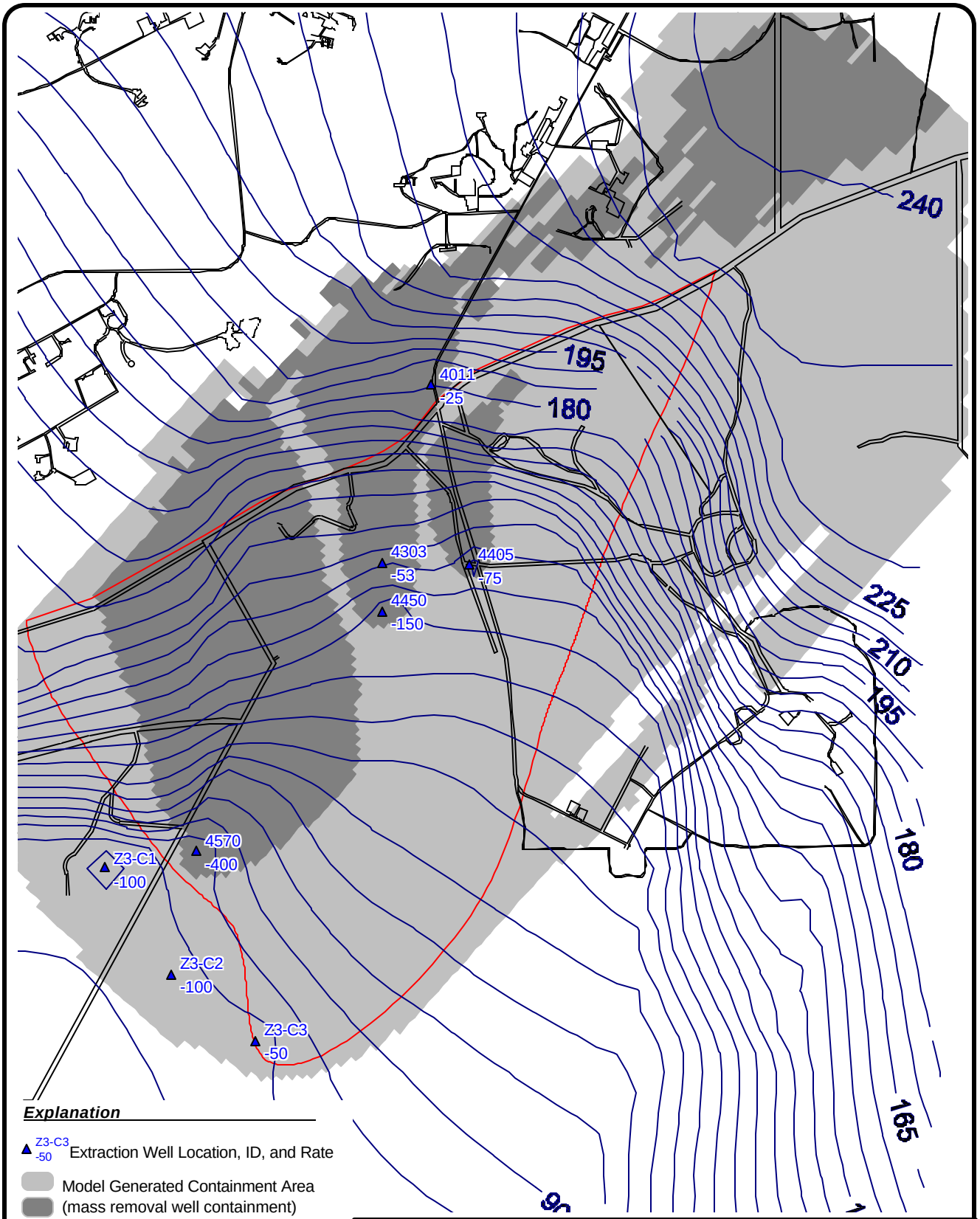
0 2,000 4,000

feet

TITLE:	Remedial Alternative Z3-2 Hydraulic Containment GET B, Layer F		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-10**
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-All2.WOR

SR10114570



Explanation

Z3-C3 -50 Extraction Well Location, ID, and Rate

Model Generated Containment Area (mass removal well containment)

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

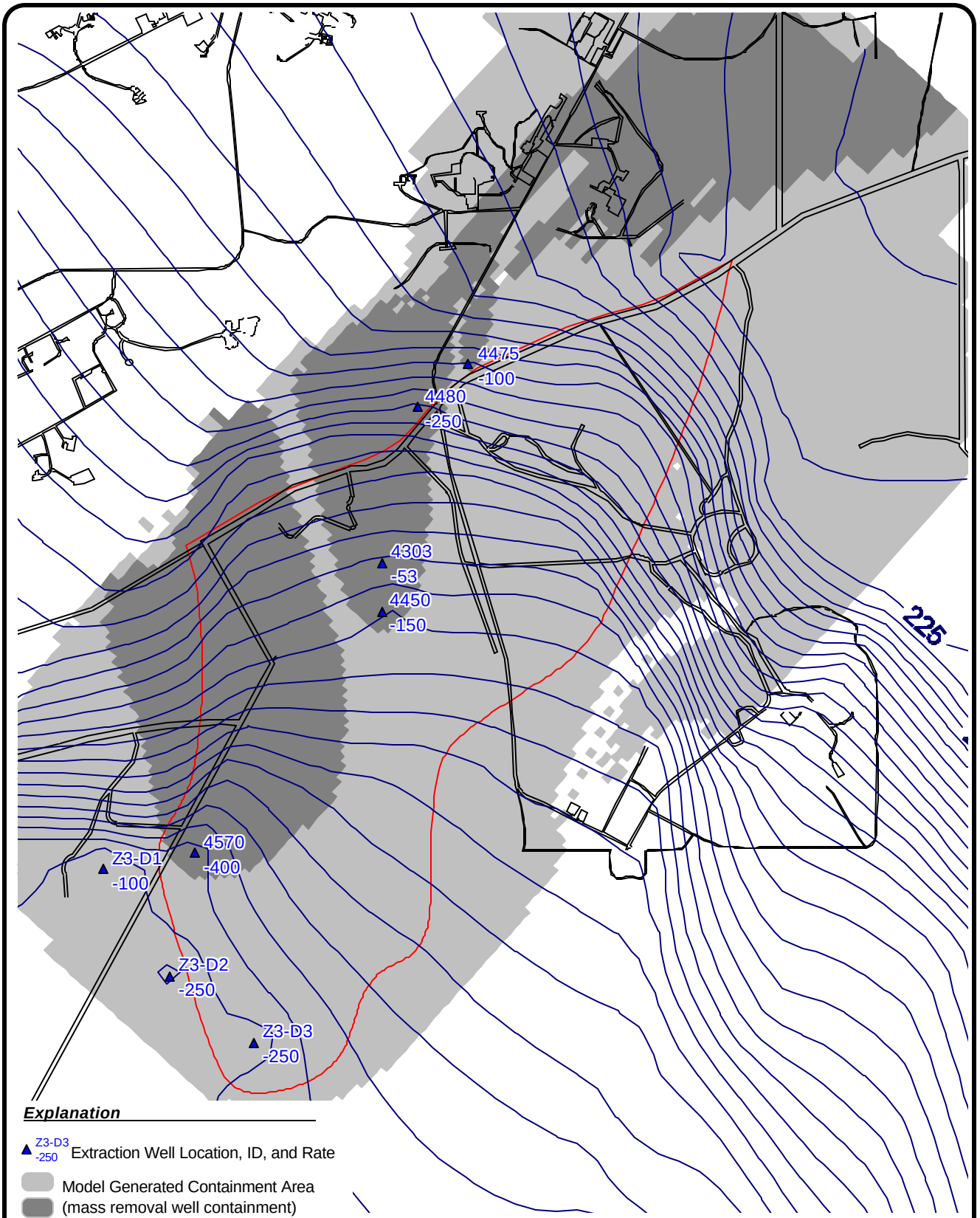
0 2,000 4,000

feet

C:\AEROJET\ZONE 3\GIS\Z3-Alt3.WOR

TITLE: Remedial Alternative Z3-3 Hydraulic Containment GET B, Layer C			
LOCATION: GenCorp Aerojet, Zone 3			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-12**
	FILE		
	DATE		

SR10114570



Explanation

Z3-D3 -250 Extraction Well Location, ID, and Rate

Model Generated Containment Area (mass removal well containment)

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

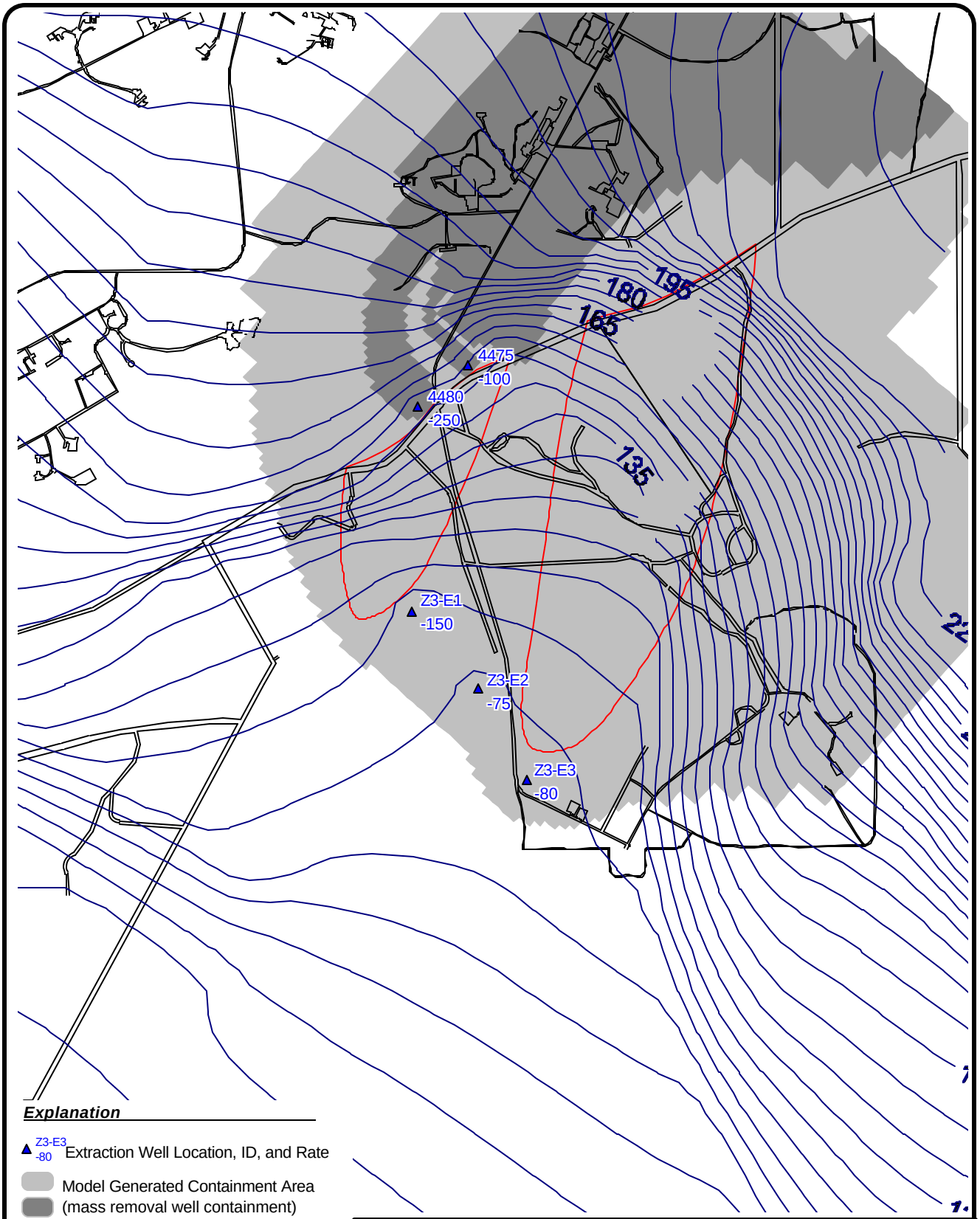
0 2,000 4,000

feet

C:\AEROJET\ZONE 3\GIS\Z3-Alt3.WOR

TITLE:	Remedial Alternative Z3-3 Hydraulic Containment GET B, Layer D		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-13**
	FILE		
	DATE		

SR10114570



Explanation

Z3-E3 -80 Extraction Well Location, ID, and Rate

Model Generated Containment Area (mass removal well containment)

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

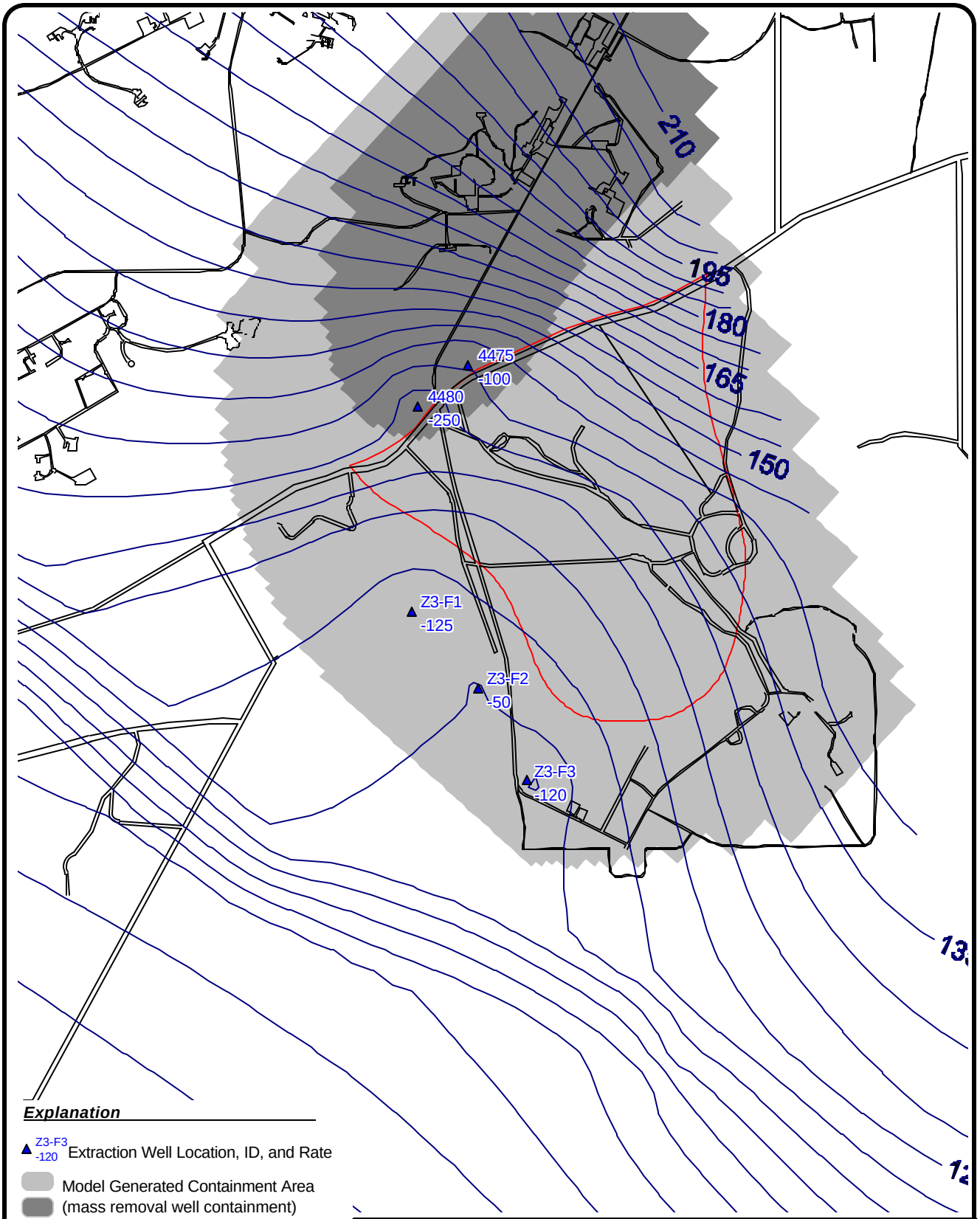
0 2,000 4,000

feet

TITLE: Remedial Alternative Z3-3 Hydraulic Containment GET B, Layer E			
LOCATION: GenCorp Aerojet, Zone 3			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H4-14**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-Alt3.WOR

SR10114570



Explanation

Z3-F3 -120 Extraction Well Location, ID, and Rate

Model Generated Containment Area (mass removal well containment)

Maximum Extent of Impacts

Computed Water Levels (ft. msl)

Note: Only wells operating in this layer are shown.

0 2,000 4,000

feet

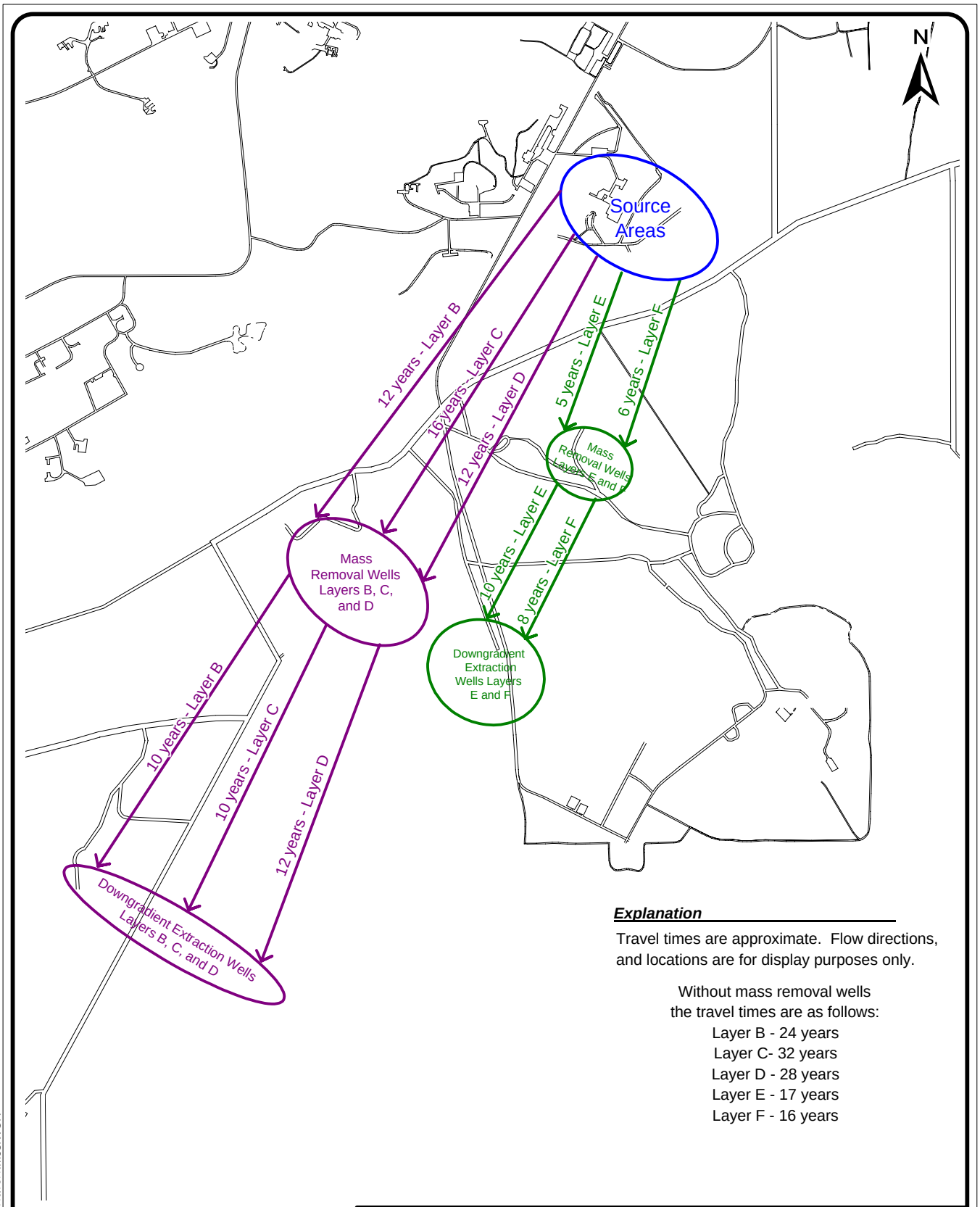
TITLE:	Remedial Alternative Z3-3 Hydraulic Containment GET B, Layer F
LOCATION:	GenCorp Aerojet, Zone 3

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		***H4-15***
FILE		
DATE		

C:\AEROJET\ZONE 3\GIS\Z3-Alt3.WOR

SR10114570



Explanation

Travel times are approximate. Flow directions, and locations are for display purposes only.

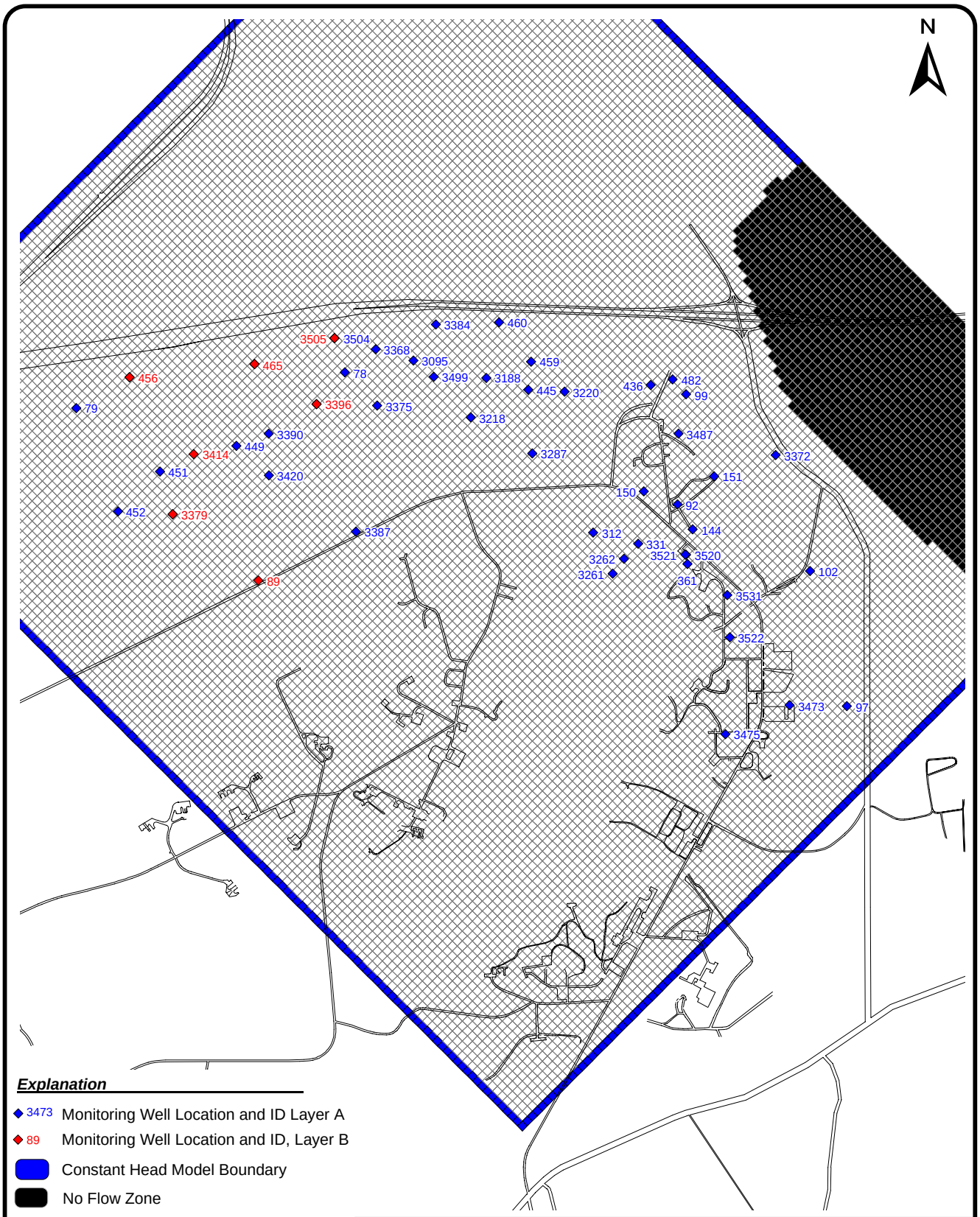
Without mass removal wells
the travel times are as follows:
Layer B - 24 years
Layer C- 32 years
Layer D - 28 years
Layer E - 17 years
Layer F - 16 years

0 2,000 4,000
feet

TITLE:	Approximate Travel Times For Zone 3 Remedial Alternatives		
LOCATION:	GenCorp Aerojet, Zone 3		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H4-16**
	FILE		
	DATE		

C:\AEROJET\ZONE 3\GIS\Z3-TravelTimes.WOR

SR10114570



Explanation

- 3473 Monitoring Well Location and ID Layer A
- 89 Monitoring Well Location and ID, Layer B
- Constant Head Model Boundary
- No Flow Zone

Note: Only Layer A no flow boundary is shown

0 2,000 4,000
feet

TITLE: Groundwater Model Grid and Calibration Targets GET A

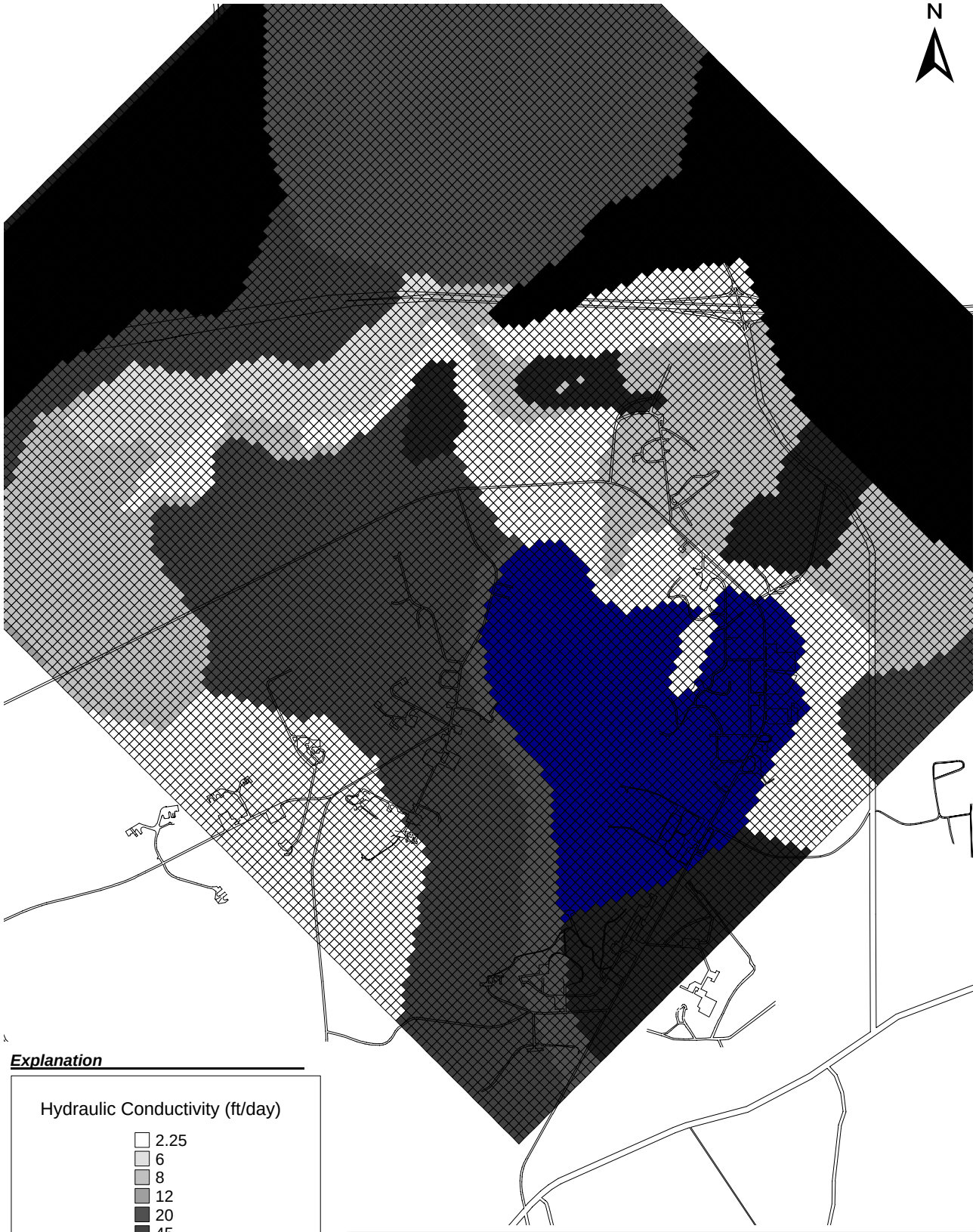
LOCATION: GenCorp Aerojet, Zone 4

CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.

CHECKED		FIGURE:
DRAFTED		**H5-1**
FILE		
DATE		

C:\AEROJET\ZONE 4\GIS\Z4-Grid.WOR

SR10114570



Explanation

Hydraulic Conductivity (ft/day)

- 2.25
- 6
- 8
- 12
- 20
- 45
- 135
- 175
- 300

0 2,000 4,000

feet

TITLE:	Hydraulic Conductivity Distribution GET A, Layer A		
LOCATION:	GenCorp Aerojet, Zone 4		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H5-2**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-HydK.WOR

SR10114570

Explanation

Hydraulic Conductivity (ft/day)

- 8
- 20
- 45
- 200

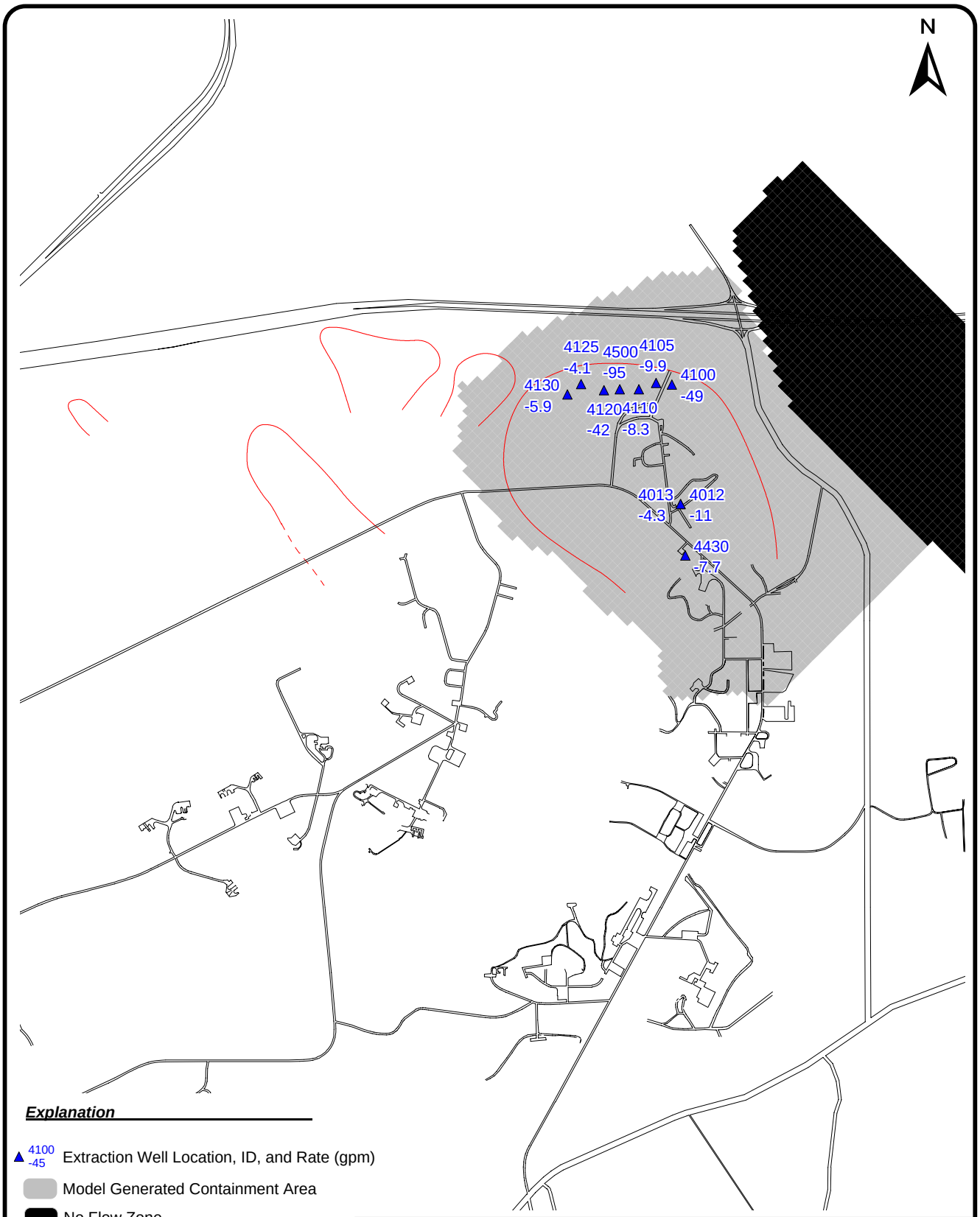
0 2,000 4,000

feet

TITLE:	Hydraulic Conductivity Distribution GET A, Layer B		
LOCATION:	GenCorp Aerojet, Zone 4		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H5-3**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-HydK.WOR

SR10114570



Explanation

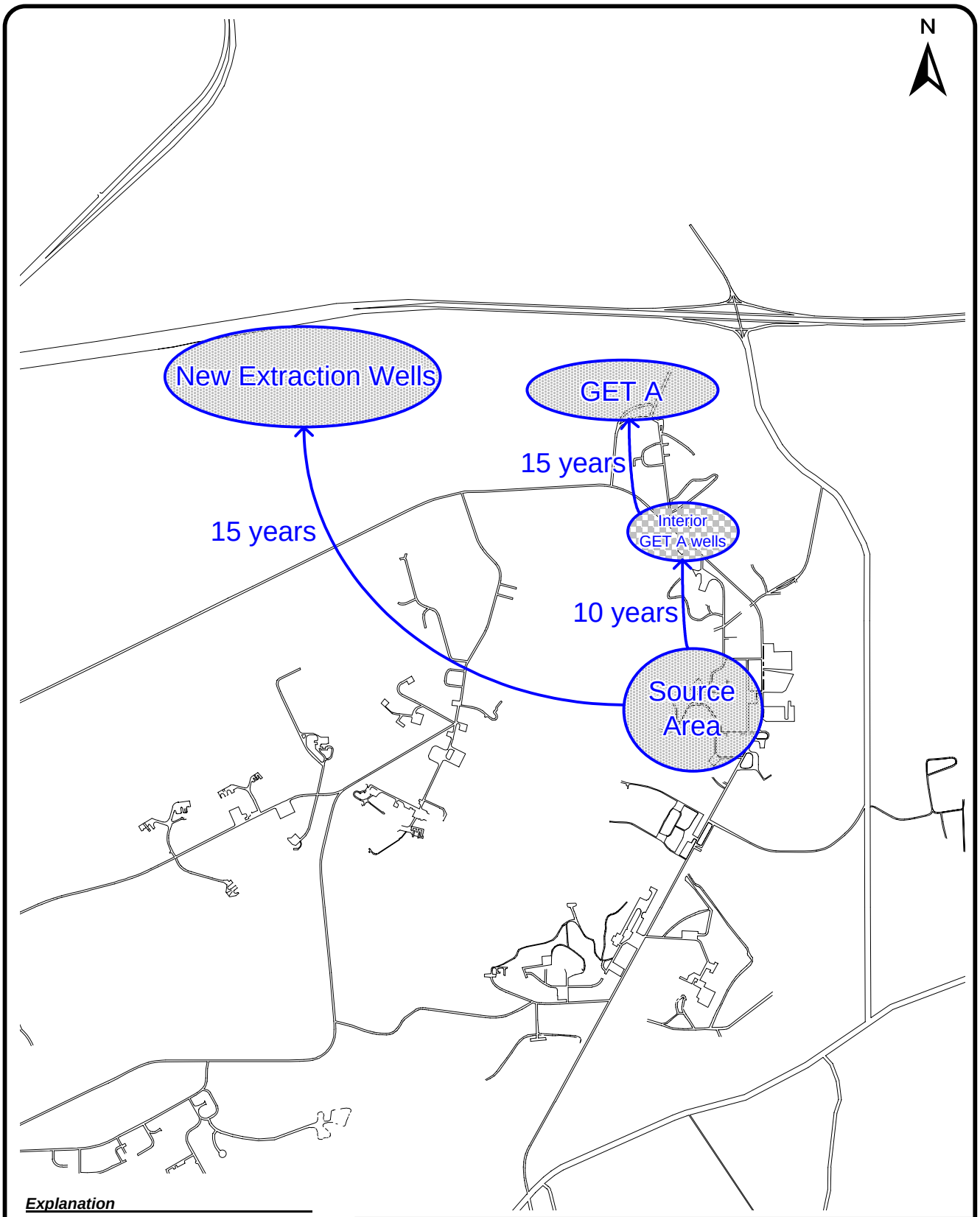
- 4100 -45 Extraction Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- No Flow Zone
- Maximum Extent of Impacts
- Computed Water Levels (ft. msl)

0 2,000 4,000
feet

TITLE:	Existing Hydraulic Containment GET A, Layer A		
LOCATION:	GenCorp Aerojet, Zone 4		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H5-4**
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-Alt1.WOR

SR10114570



Explanation

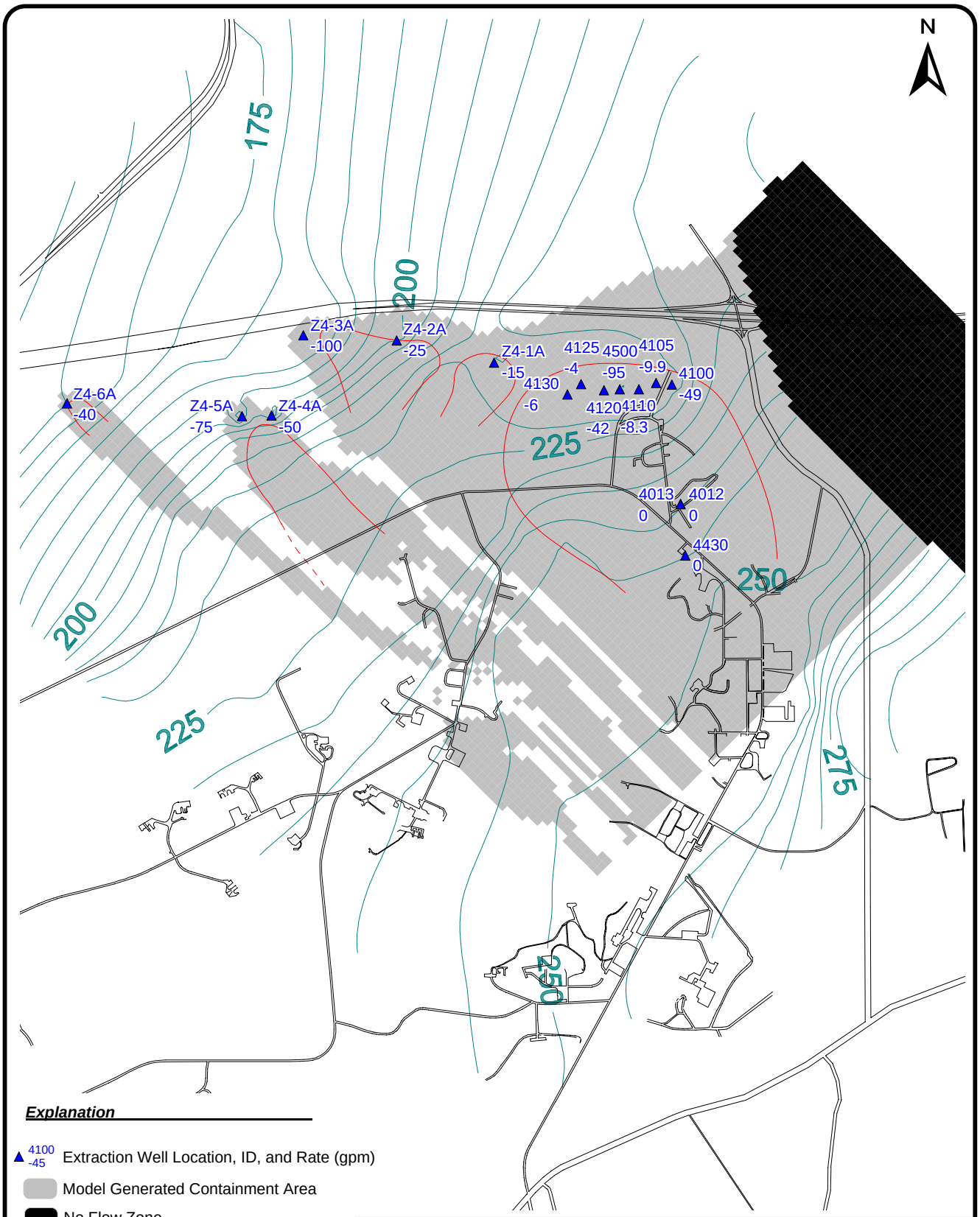
Travel times are shown for both Layers A and B. Travel times, locations, and flow directions are for display only. Stagnation zones are not accounted for in the time estimates

0 2,000 4,000
feet

TITLE:	Approximate Travel Times for Zone 4 Remedial Alternatives		
LOCATION:	GenCorp Aerojet, Zone 4		
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE:
	DRAFTED		**H5-5**
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-TravelTimes.WOR

SR10114570



Explanation

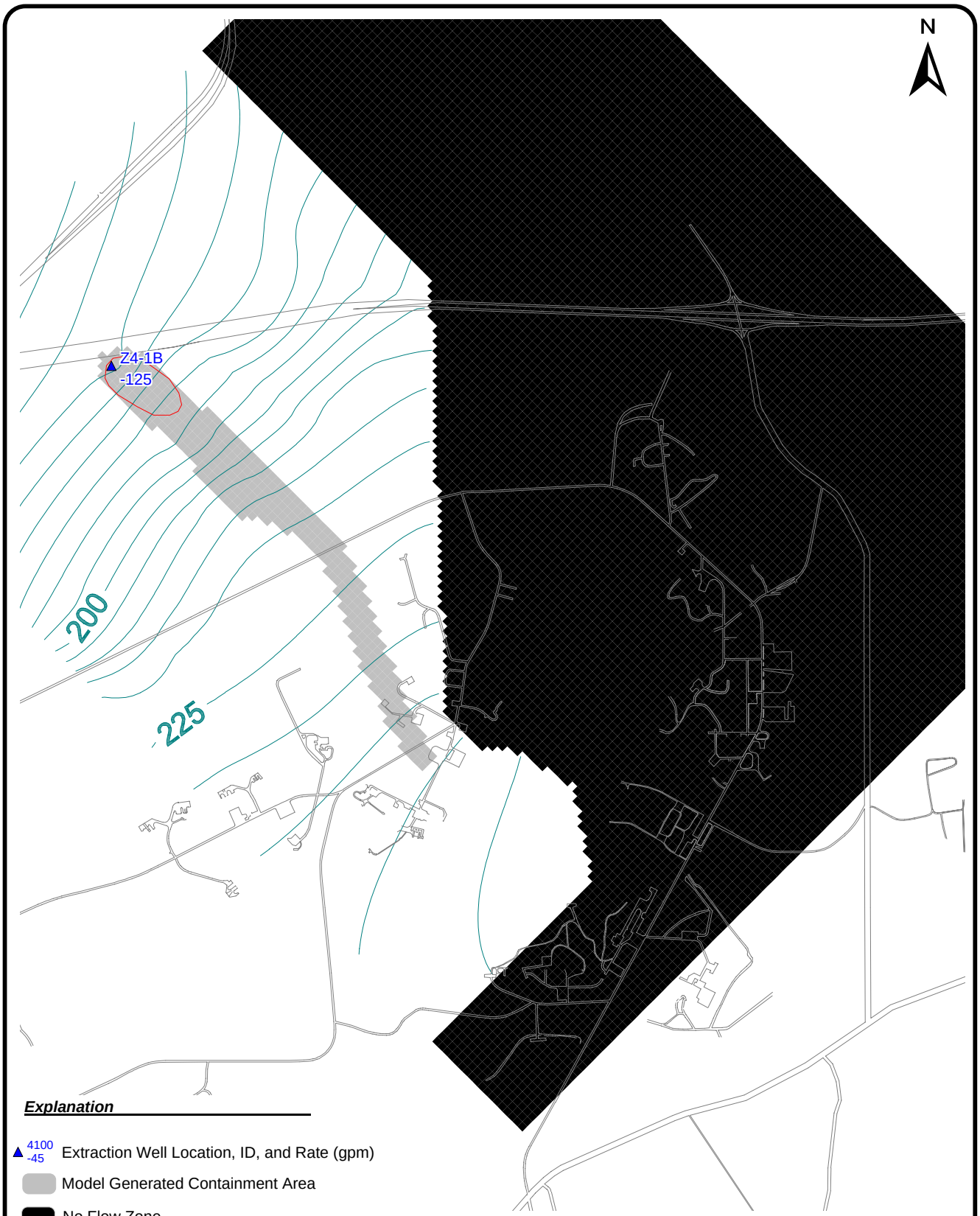
- 4100 -45 Extraction Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- No Flow Zone
- Maximum Extent of Impacts
- Computed Water Levels (ft. msl)

0 2,000 4,000
feet

TITLE: Remedial Alternative Z4-2 Hydraulic Containment GET A, Layer A			
LOCATION: GenCorp Aerojet, Zone 4			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H5-6**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-Alt2.WOR

SR10114570



Explanation

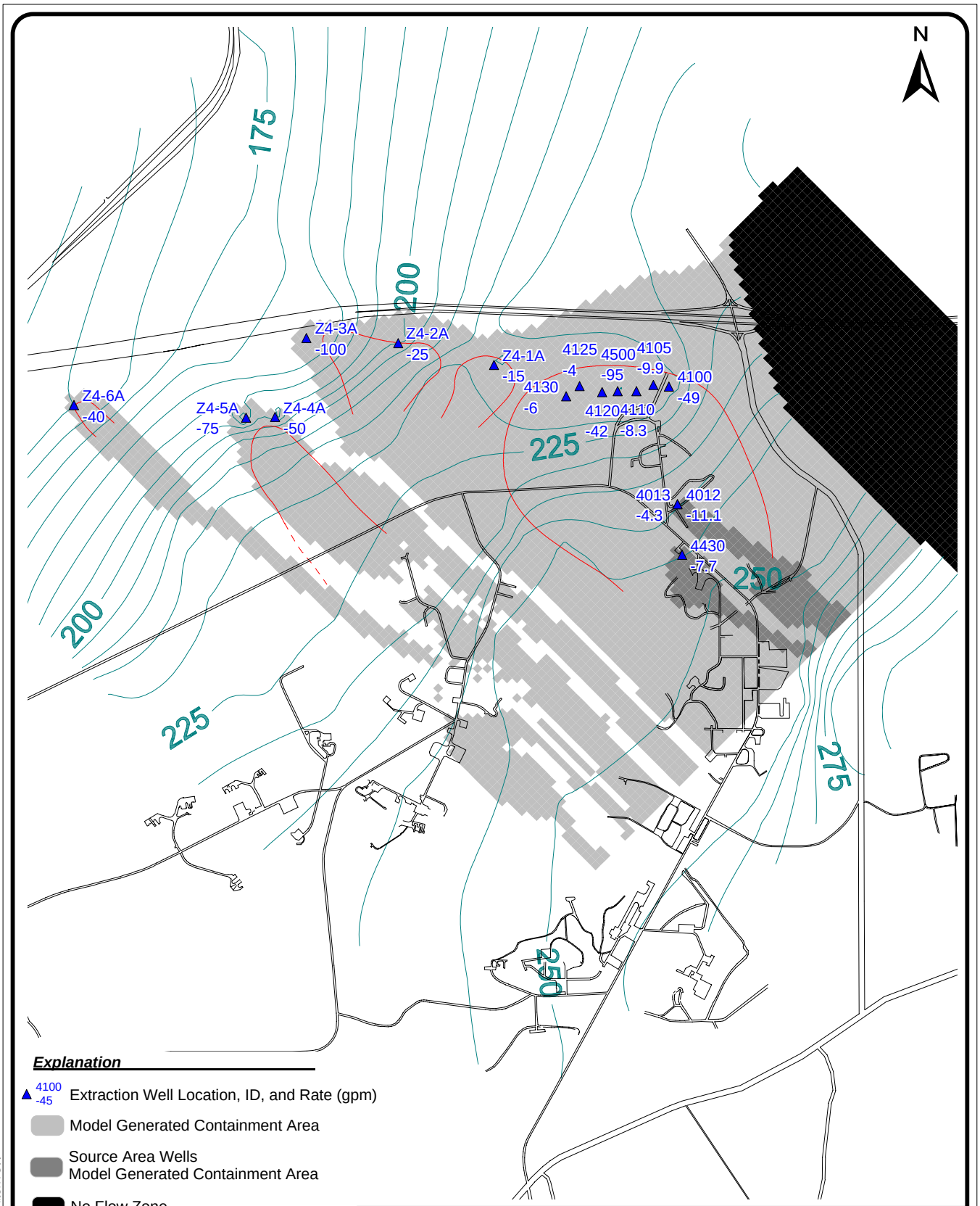
- 4100 -45 Extraction Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- No Flow Zone
- Maximum Extent of Impacts
- Computed Water Levels (ft. msl)

0 2,000 4,000
feet

TITLE: Remedial Alternative Z4-2 Hydraulic Containment GET A, Layer B			
LOCATION: GenCorp Aerojet, Zone 4			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H5-7**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-Alt2.WOR

SR10114570



Explanation

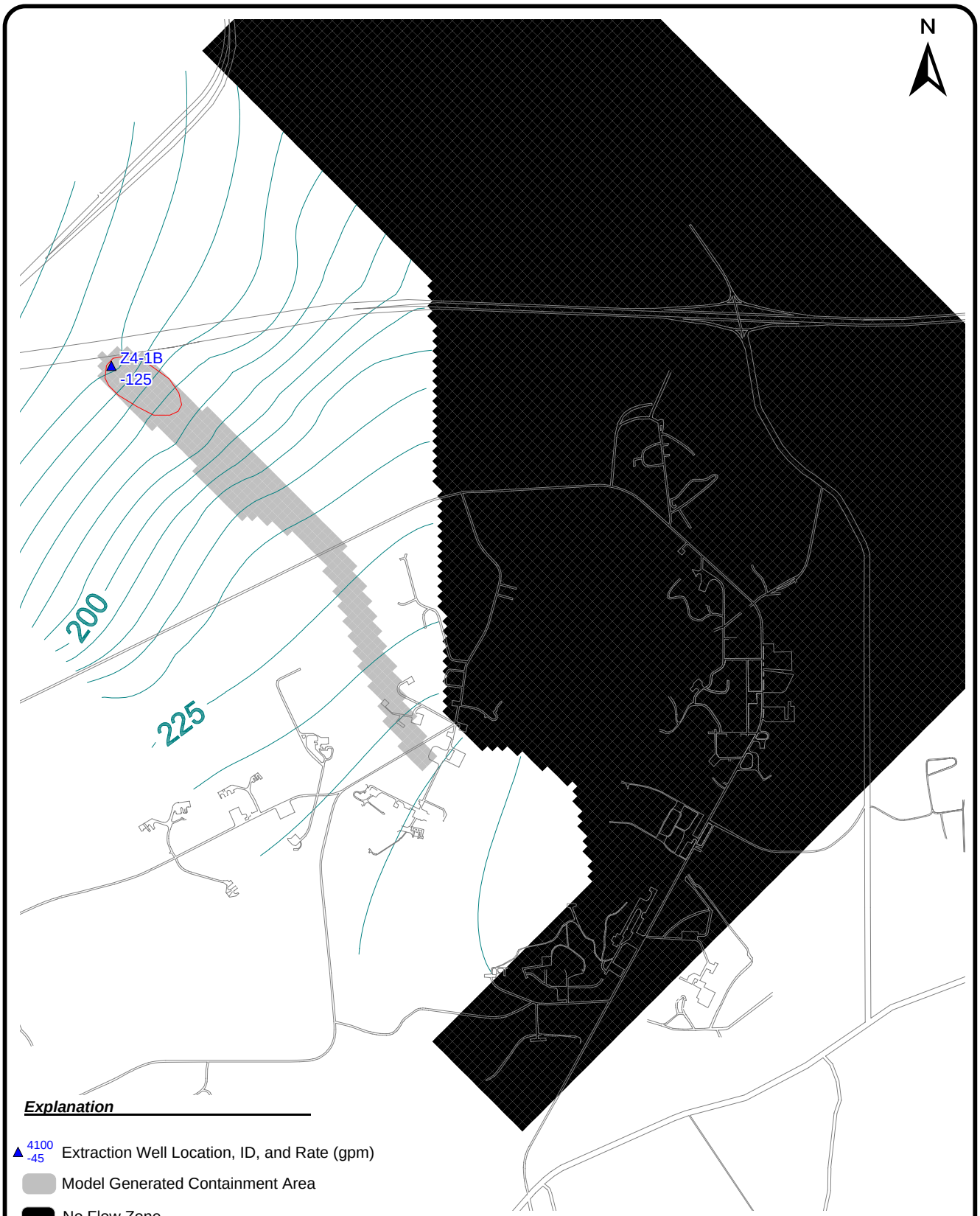
- 4100 -45 — Extraction Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- Source Area Wells Model Generated Containment Area
- No Flow Zone
- Maximum Extent of Impacts
- Computed Water Levels (ft. msl)

0 2,000 4,000
feet

TITLE: Remedial Alternative Z4-3 Hydraulic Containment GET A, Layer A			
LOCATION: GenCorp Aerojet, Zone 4			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H5-8**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-Alt3.WOR

SR10114570



Explanation

- 4100 -45 Extraction Well Location, ID, and Rate (gpm)
- Model Generated Containment Area
- No Flow Zone
- Maximum Extent of Impacts
- Computed Water Levels (ft. msl)

0 2,000 4,000
feet

TITLE: Remedial Alternative Z4-3 Hydraulic Containment GET A, Layer B			
LOCATION: GenCorp Aerojet, Zone 4			
CVEI CENTRAL VALLEY ENVIRONMENTAL, INC.	CHECKED		FIGURE: **H5-9**
	DRAFTED		
	FILE		
	DATE		

C:\AEROJET\ZONE 4\GIS\Z4-Alt3.WOR

SR10114570

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1567	7/19/1994	1	57.4	60.7	-3.2
1567	11/28/1994	1	57.0	60.0	-3.1
1567	4/24/1995	1	64.8	61.3	3.5
1567	12/8/1995	1	58.6	62.5	-3.9
1567	3/17/1997	1	63.4	61.6	1.8
1567	4/20/1998	1	63.3	59.8	3.4
1567	10/19/1999	1	50.2	49.4	0.8
1567	4/19/2000	1	54.6	50.3	4.3
1567	10/23/2000	1	51.8	51.0	0.8
1567	4/23/2001	1	51.9	50.7	1.2
1567	10/9/2001	1	50.2	49.6	0.6
1567	4/16/2002	1	53.0	47.9	5.0
1567	10/21/2002	1	49.0	46.5	2.5
62	9/23/1986	2	92.2	96.3	-4.2
62	9/1/1987	2	88.3	94.4	-6.0
62	11/13/1987	2	86.6	94.1	-7.5
62	7/12/1988	2	86.5	91.6	-5.1
62	12/8/1988	2	83.3	90.3	-7.0
62	3/30/1989	2	86.0	90.4	-4.3
62	10/25/1989	2	83.4	89.6	-6.2
62	4/18/1990	2	88.8	88.9	-0.1
62	10/8/1990	2	84.2	87.9	-3.7
62	4/24/1991	2	84.0	87.8	-3.7
62	10/16/1991	2	81.1	88.0	-6.9
62	1/10/1992	2	81.0	88.0	-7.1
62	4/14/1992	2	83.8	87.9	-4.1
62	7/2/1992	2	83.2	87.8	-4.6
62	10/16/1992	2	81.5	87.8	-6.3
62	1/12/1993	2	80.9	87.8	-6.9
62	4/21/1993	2	87.1	88.3	-1.2
62	10/18/1993	2	83.0	88.8	-5.8
62	4/20/1994	2	82.5	87.4	-4.8
62	10/27/1994	2	80.1	85.6	-5.5
62	4/25/1995	2	89.4	87.8	1.6
62	10/26/1995	2	87.2	90.4	-3.2
62	4/16/1996	2	90.3	91.8	-1.5
62	10/22/1996	2	86.0	92.4	-6.4
62	4/15/1997	2	92.8	91.1	1.7
62	10/8/1997	2	85.9	89.7	-3.8
62	4/21/1998	2	94.7	91.7	3.0
62	10/20/1998	2	92.1	94.7	-2.6
62	4/5/1999	2	92.9	92.1	0.8
62	10/19/1999	2	85.9	87.6	-1.7
62	10/23/2000	2	86.9	87.1	-0.2
62	4/23/2001	2	86.6	87.0	-0.4
62	4/15/2002	2	84.7	82.8	2.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
62	10/28/2002	2	80.8	80.6	0.2
441	4/23/1986	2	80.7	73.9	6.7
441	9/23/1986	2	75.6	73.7	1.8
441	6/17/1987	2	73.6	72.7	0.9
441	9/1/1987	2	70.7	72.5	-1.8
441	11/13/1987	2	70.1	72.2	-2.1
441	2/16/1988	2	70.2	71.5	-1.2
441	7/12/1988	2	68.7	69.7	-1.1
441	12/7/1988	2	66.7	68.1	-1.4
441	3/22/1989	2	67.6	67.5	0.0
441	10/25/1989	2	65.9	66.5	-0.6
441	4/20/1990	2	67.5	65.5	2.0
441	10/9/1990	2	64.6	64.5	0.1
441	4/24/1991	2	64.0	64.5	-0.5
441	12/18/1991	2	63.0	65.0	-2.0
441	6/3/1992	2	63.7	65.1	-1.4
441	11/8/1992	2	62.7	65.0	-2.2
441	4/22/1993	2	66.3	65.4	0.9
441	10/19/1993	2	63.8	66.1	-2.3
441	4/18/1994	2	63.5	64.9	-1.4
441	10/24/1994	2	59.9	62.8	-3.0
441	6/27/1995	2	68.9	65.4	3.5
441	10/23/1995	2	65.5	67.2	-1.8
441	4/15/1996	2	67.9	68.5	-0.6
441	10/21/1996	2	63.8	69.0	-5.2
441	4/14/1997	2	69.2	67.9	1.3
441	10/6/1997	2	65.0	66.4	-1.3
441	5/22/1998	2	72.3	68.6	3.6
441	10/21/1998	2	70.1	71.2	-1.0
441	4/6/1999	2	70.6	69.4	1.2
441	10/18/1999	2	65.0	64.9	0.1
441	4/17/2000	2	65.7	63.9	1.8
441	7/12/2000	2	66.1	64.1	1.9
441	10/23/2000	2	64.4	64.5	0.0
441	1/10/2001	2	63.9	64.5	-0.6
441	4/24/2001	2	63.5	63.4	0.1
441	10/9/2001	2	60.7	61.6	-0.9
441	4/16/2002	2	62.9	55.0	8.0
441	10/21/2002	2	59.6	52.8	6.8
1169	10/4/1983	2	57.4	61.2	-3.9
1169	11/20/1984	2	54.4	53.5	0.9
1169	6/17/1987	2	47.9	45.8	2.1
1169	9/3/1987	2	45.6	45.6	0.0
1169	2/16/1988	2	48.0	44.7	3.3
1169	7/12/1988	2	45.1	43.1	2.0
1169	12/12/1988	2	45.2	41.4	3.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1169	8/13/1991	2	41.8	38.8	3.0
1169	11/12/1991	2	41.8	38.9	2.8
1169	1/28/1992	2	43.2	39.0	4.3
1169	4/29/1992	2	42.8	38.9	3.9
1169	9/28/1992	2	40.8	38.7	2.1
1169	4/21/1993	2	44.3	38.9	5.4
1169	7/29/1993	2	39.9	39.1	0.8
1169	10/20/1993	2	39.1	39.3	-0.2
1169	4/18/1994	2	39.6	38.4	1.2
1169	8/17/1994	2	35.0	37.1	-2.1
1169	10/27/1994	2	35.6	36.4	-0.8
1169	4/25/1995	2	41.5	37.1	4.4
1169	7/5/1995	2	40.7	37.9	2.8
1169	10/25/1995	2	38.4	39.1	-0.7
1169	1/9/1996	2	41.0	39.9	1.1
1169	4/16/1996	2	41.7	39.9	1.8
1169	7/2/1996	2	38.5	39.9	-1.5
1169	10/22/1996	2	37.8	39.9	-2.1
1169	4/16/1997	2	41.8	39.2	2.6
1169	10/7/1997	2	37.8	38.2	-0.3
1169	1/19/1998	2	39.9	37.9	2.0
1169	4/29/1998	2	43.3	38.9	4.4
1169	7/17/1998	2	42.0	39.7	2.3
1169	10/20/1998	2	41.1	40.7	0.3
1169	1/4/1999	2	40.9	41.4	-0.5
1169	4/26/1999	2	40.7	38.9	1.9
1169	6/16/2000	2	36.7	33.9	2.8
1169	12/11/2000	2	37.7	34.5	3.3
1169	4/3/2001	2	35.8	33.3	2.4
1169	6/20/2002	2	35.9	28.0	7.8
1169	12/3/2002	2	35.2	26.3	8.9
1361	9/23/1986	2	81.8	85.9	-4.0
1361	6/17/1987	2	80.1	84.6	-4.5
1361	9/2/1987	2	79.1	84.3	-5.2
1361	11/16/1987	2	77.1	84.1	-7.0
1361	2/16/1988	2	76.7	83.3	-6.7
1361	5/3/1988	2	76.2	82.6	-6.4
1361	12/7/1988	2	76.2	80.9	-4.8
1361	3/23/1989	2	74.8	80.8	-6.1
1361	7/20/1990	2	74.8	79.0	-4.2
1361	10/8/1990	2	74.1	78.7	-4.6
1361	7/30/1991	2	73.5	78.9	-5.4
1361	4/14/1992	2	73.0	79.0	-6.1
1361	7/22/1992	2	73.2	79.0	-5.9
1361	10/19/1992	2	72.1	79.0	-6.9
1361	2/3/1993	2	72.3	79.1	-6.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1361	7/29/1993	2	76.3	79.7	-3.4
1361	10/20/1993	2	73.9	79.8	-5.9
1361	2/1/1994	2	72.9	79.5	-6.6
1361	4/18/1994	2	72.7	78.6	-5.9
1361	7/18/1994	2	71.5	77.8	-6.3
1361	4/25/1995	2	76.6	79.0	-2.4
1361	1/23/1996	2	75.3	81.7	-6.5
1361	4/16/1996	2	77.6	81.8	-4.1
1361	7/15/1996	2	77.6	81.9	-4.4
1361	10/21/1996	2	75.1	82.1	-7.0
1361	1/9/1997	2	75.6	82.1	-6.5
1361	4/16/1997	2	79.6	80.8	-1.2
1361	7/24/1997	2	78.0	80.1	-2.0
1361	10/31/1997	2	75.2	79.5	-4.2
1361	4/21/1998	2	80.8	81.2	-0.4
1361	7/23/1998	2	82.6	82.4	0.2
1361	10/21/1998	2	79.7	83.4	-3.7
1361	1/19/1999	2	77.9	82.7	-4.8
1361	4/19/1999	2	79.5	79.1	0.3
1361	7/29/1999	2	77.1	76.8	0.2
1361	10/19/1999	2	75.1	75.3	-0.2
1361	1/10/2000	2	73.7	74.2	-0.4
1361	4/25/2000	2	76.1	74.7	1.4
1361	7/5/2000	2	76.7	75.0	1.8
1361	10/24/2000	2	75.1	75.3	-0.3
1361	1/22/2001	2	73.7	75.5	-1.8
1361	4/24/2001	2	74.1	74.9	-0.8
1361	7/22/2001	2	73.3	74.2	-0.9
1361	10/9/2001	2	71.7	73.6	-1.9
1361	1/28/2002	2	71.9	72.0	0.0
1361	5/1/2002	2	73.0	70.5	2.5
1361	7/11/2002	2	72.2	69.6	2.5
1361	10/22/2002	2	66.0	68.7	-2.7
1403	9/23/1986	2	82.9	87.5	-4.6
1403	9/1/1987	2	81.6	86.4	-4.8
1403	11/17/1987	2	80.5	86.2	-5.7
1403	2/16/1988	2	80.1	85.6	-5.6
1403	8/17/1988	2	80.1	84.6	-4.6
1403	12/7/1988	2	78.9	84.1	-5.2
1403	10/25/1989	2	80.7	83.6	-2.9
1403	5/24/1990	2	79.5	82.8	-3.2
1403	11/13/1990	2	78.8	82.3	-3.4
1403	11/4/1991	2	78.6	82.7	-4.1
1403	1/23/1992	2	78.1	82.8	-4.7
1403	4/14/1992	2	78.7	82.8	-4.1
1403	10/21/1992	2	77.8	82.8	-5.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1403	7/29/1993	2	80.8	83.3	-2.5
1403	10/18/1993	2	79.9	83.4	-3.6
1403	4/19/1994	2	78.4	82.4	-4.0
1403	7/19/1994	2	78.5	81.9	-3.3
1403	10/24/1994	2	77.5	81.4	-3.9
1403	4/24/1995	2	82.7	83.2	-0.5
1403	7/18/1995	2	83.4	83.9	-0.5
1403	10/24/1995	2	80.4	84.6	-4.2
1403	4/16/1996	2	81.5	84.8	-3.4
1403	7/15/1996	2	81.0	84.9	-3.9
1403	10/22/1996	2	79.4	85.0	-5.6
1403	1/9/1997	2	85.1	84.9	0.1
1403	4/15/1997	2	81.9	83.9	-2.0
1403	10/7/1997	2	79.4	83.0	-3.6
1403	1/14/1998	2	79.5	82.8	-3.3
1403	4/21/1998	2	83.6	83.8	-0.3
1403	8/5/1998	2	82.8	84.7	-1.9
1403	10/21/1998	2	79.7	85.3	-5.6
1403	1/19/1999	2	78.7	83.4	-4.7
1403	4/6/1999	2	79.7	79.8	-0.1
1403	8/4/1999	2	78.6	77.5	1.1
1403	10/20/1999	2	77.5	76.5	1.0
1403	1/11/2000	2	76.7	75.8	0.9
1403	4/18/2000	2	79.0	76.6	2.4
1403	10/24/2000	2	77.8	77.1	0.6
1403	1/22/2001	2	77.1	77.3	-0.2
1403	4/24/2001	2	77.0	76.9	0.1
1403	10/8/2001	2	76.1	76.0	0.0
1403	1/15/2002	2	76.0	75.2	0.8
1403	4/15/2002	2	77.0	73.9	3.1
1403	7/17/2002	2	76.8	73.2	3.6
1403	10/21/2002	2	75.7	72.6	3.2
1475	8/6/1991	2	99.3	99.3	0.0
1475	11/8/1991	2	97.3	99.3	-2.1
1475	4/27/1992	2	98.8	99.2	-0.5
1475	1/28/1993	2	97.8	99.2	-1.4
1475	7/29/1993	2	100.6	99.6	1.0
1475	10/20/1993	2	99.3	99.8	-0.6
1475	2/3/1994	2	98.3	99.7	-1.4
1475	4/18/1994	2	98.2	99.1	-0.9
1475	7/18/1994	2	97.2	98.5	-1.3
1475	10/26/1994	2	96.1	97.8	-1.8
1475	4/24/1995	2	102.9	98.5	4.4
1475	10/25/1995	2	100.3	100.5	-0.1
1475	1/22/1996	2	98.5	101.2	-2.8
1475	10/22/1996	2	98.9	102.2	-3.3

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1475	1/16/1997	2	100.9	102.3	-1.4
1475	4/16/1997	2	97.4	101.4	-4.1
1475	10/7/1997	2	99.3	100.3	-0.9
1475	4/21/1998	2	105.2	100.4	4.9
1475	10/21/1998	2	102.5	102.7	-0.3
1475	1/19/1999	2	100.2	102.6	-2.4
1475	10/20/1999	2	97.7	96.1	1.6
1475	1/11/2000	2	96.8	94.9	1.8
1475	4/18/2000	2	101.2	95.0	6.2
1475	10/24/2000	2	98.1	95.5	2.5
1475	1/22/2001	2	96.4	95.5	0.9
1475	4/24/2001	2	95.9	94.9	1.1
1475	10/8/2001	2	94.9	93.8	1.1
1475	1/15/2002	2	95.5	93.4	2.1
1475	4/15/2002	2	95.8	93.3	2.5
1475	10/21/2002	2	93.9	91.6	2.3
1487	7/7/1991	2	69.6	69.8	-0.3
1487	11/6/1991	2	68.8	69.9	-1.1
1487	1/21/1992	2	68.4	70.0	-1.6
1487	4/22/1992	2	68.7	70.0	-1.3
1487	10/21/1992	2	68.3	70.0	-1.7
1487	7/29/1993	2	70.5	70.4	0.1
1487	10/20/1993	2	69.7	70.4	-0.8
1487	4/18/1994	2	68.6	69.7	-1.2
1487	8/15/1994	2	68.4	69.2	-0.8
1487	10/27/1994	2	63.4	68.8	-5.4
1487	4/25/1995	2	71.8	69.9	1.9
1487	12/6/1995	2	69.6	71.3	-1.7
1487	4/21/1998	2	72.0	69.8	2.2
1487	6/4/2002	2	66.6	59.7	6.9
1487	12/2/2002	2	65.6	58.6	7.0
1506	1/15/1992	2	49.6	47.7	1.9
1506	4/14/1992	2	50.3	47.7	2.6
1506	6/30/1992	2	50.0	47.7	2.3
1506	1/18/1993	2	49.1	47.6	1.5
1506	7/29/1993	2	50.1	48.1	2.0
1506	10/20/1993	2	48.4	48.2	0.2
1506	4/18/1994	2	48.0	47.3	0.7
1506	8/18/1994	2	45.6	46.3	-0.7
1506	2/1/1995	2	48.2	45.7	2.5
1506	4/25/1995	2	52.0	46.5	5.5
1506	12/7/1995	2	47.9	48.4	-0.5
1506	1/9/1997	2	51.6	48.2	3.4
1506	6/1/1998	2	51.3	46.3	5.0
1506	10/20/1999	2	41.1	39.0	2.1
1506	6/26/2000	2	41.8	38.5	3.3

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1506	10/24/2000	2	43.1	38.9	4.2
1506	4/24/2001	2	40.1	38.0	2.1
1506	10/8/2001	2	40.0	36.3	3.7
1506	4/16/2002	2	42.5	33.9	8.6
1506	10/21/2002	2	37.0	31.8	5.2
1509	1/14/1992	2	66.9	70.2	-3.2
1509	4/14/1992	2	63.9	70.3	-6.4
1509	7/7/1992	2	67.5	70.3	-2.8
1509	10/19/1992	2	66.5	70.3	-3.7
1509	1/14/1993	2	66.4	70.3	-3.9
1509	4/22/1993	2	69.1	70.6	-1.6
1509	7/29/1993	2	68.2	70.7	-2.5
1509	10/18/1993	2	67.3	70.8	-3.5
1509	4/18/1994	2	66.7	69.7	-2.9
1509	10/24/1994	2	65.8	68.8	-3.0
1509	2/2/1995	2	68.1	69.9	-1.8
1509	4/24/1995	2	70.5	70.8	-0.3
1509	12/8/1995	2	67.3	72.1	-4.8
1509	10/6/1997	2	66.6	69.5	-2.9
1509	4/20/1998	2	70.2	70.6	-0.4
1509	7/26/1999	2	64.3	63.4	0.9
1509	6/25/2000	2	64.4	63.6	0.8
1509	6/5/2002	2	63.0	59.8	3.3
1509	12/12/2002	2	61.5	58.6	2.9
1519	1/8/1993	2	62.5	64.8	-2.3
1519	4/23/1993	2	65.1	65.0	0.0
1519	7/30/1993	2	62.8	65.2	-2.4
1519	10/18/1993	2	62.3	65.2	-3.0
1519	4/18/1994	2	63.5	64.3	-0.9
1519	8/12/1994	2	62.6	63.7	-1.1
1519	10/27/1994	2	62.2	63.4	-1.2
1519	4/24/1995	2	68.3	64.9	3.4
1519	10/23/1995	2	62.1	65.9	-3.8
1519	4/15/1996	2	67.1	65.9	1.2
1519	8/2/1996	2	64.0	65.8	-1.9
1519	10/21/1996	2	62.6	65.8	-3.2
1519	1/9/1997	2	69.2	65.6	3.5
1519	4/14/1997	2	66.1	64.6	1.4
1519	10/6/1997	2	62.9	64.0	-1.1
1519	1/13/1998	2	63.8	63.7	0.0
1519	4/20/1998	2	67.6	63.9	3.7
1519	7/28/1998	2	65.7	64.2	1.5
1519	10/20/1998	2	61.4	64.5	-3.1
1519	1/18/1999	2	60.1	62.5	-2.3
1519	4/5/1999	2	61.2	57.9	3.3
1519	7/26/1999	2	59.0	55.4	3.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1519	10/19/1999	2	57.8	54.2	3.6
1519	1/10/2000	2	58.1	53.7	4.4
1519	4/19/2000	2	61.1	55.2	5.8
1519	10/23/2000	2	58.4	55.8	2.5
1519	1/23/2001	2	58.4	55.8	2.6
1519	4/23/2001	2	58.8	55.3	3.5
1519	10/8/2001	2	57.3	54.4	2.9
1519	1/14/2002	2	58.5	53.6	4.9
1519	4/16/2002	2	59.3	52.5	6.8
1519	10/21/2002	2	56.8	51.1	5.6
1526	1/8/1993	2	48.3	50.3	-2.0
1526	4/23/1993	2	50.9	50.6	0.4
1526	7/30/1993	2	49.9	50.7	-0.8
1526	10/18/1993	2	48.2	50.8	-2.5
1526	4/18/1994	2	47.7	50.0	-2.2
1526	10/27/1994	2	45.7	48.6	-2.9
1526	4/24/1995	2	52.4	49.4	2.9
1526	7/11/1995	2	50.6	50.0	0.6
1526	1/3/1996	2	47.1	51.0	-4.0
1526	4/1/1996	2	49.5	50.9	-1.4
1526	7/15/1996	2	48.7	50.8	-2.1
1526	10/21/1996	2	46.0	50.8	-4.7
1526	4/14/1997	2	50.1	49.8	0.4
1526	10/8/1997	2	45.4	48.9	-3.5
1526	1/20/1998	2	46.8	47.6	-0.8
1526	4/20/1998	2	50.5	46.9	3.6
1526	7/15/1998	2	49.3	47.2	2.1
1526	10/20/1998	2	38.4	47.6	-9.2
1526	1/18/1999	2	37.3	44.0	-6.8
1526	4/15/1999	2	37.5	38.3	-0.7
1526	7/26/1999	2	34.9	35.5	-0.6
1526	10/18/1999	2	33.8	33.7	0.1
1526	1/10/2000	2	34.8	32.9	1.9
1526	4/20/2000	2	37.5	34.8	2.8
1526	7/7/2000	2	36.6	35.1	1.5
1526	10/23/2000	2	36.7	35.5	1.2
1526	1/23/2001	2	36.2	35.7	0.5
1526	4/23/2001	2	35.9	35.1	0.9
1526	10/8/2001	2	34.5	33.5	1.0
1526	1/14/2002	2	35.2	32.4	2.8
1526	4/16/2002	2	36.7	31.1	5.6
1526	7/16/2002	2	35.5	30.0	5.5
1526	10/21/2002	2	32.5	29.0	3.5
1539	7/30/1993	2	52.1	54.9	-2.8
1539	10/18/1993	2	50.7	55.0	-4.3
1539	1/12/1994	2	50.4	54.9	-4.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1539	4/18/1994	2	50.6	54.1	-3.5
1539	7/7/1994	2	48.8	53.6	-4.8
1539	10/27/1994	2	48.2	52.9	-4.7
1539	4/25/1995	2	54.5	54.0	0.6
1539	11/28/1995	2	49.9	55.3	-5.5
1539	6/15/1998	2	53.4	51.6	1.7
1539	11/6/1998	2	41.9	52.2	-10.3
1539	5/10/2000	2	40.8	39.5	1.3
1539	5/9/2002	2	40.3	35.9	4.4
1539	11/15/2002	2	36.5	34.0	2.5
1560	11/22/1993	2	41.0	42.1	-1.1
1560	4/18/1994	2	41.1	41.4	-0.3
1560	10/27/1994	2	38.7	40.0	-1.3
1560	6/12/1998	2	42.1	39.6	2.5
1560	7/27/1999	2	33.7	34.6	-0.9
1560	10/18/1999	2	32.3	33.0	-0.7
1560	4/17/2000	2	33.6	32.1	1.6
1560	10/23/2000	2	32.5	32.6	-0.1
1560	4/23/2001	2	32.5	31.9	0.7
1560	10/9/2001	2	30.8	30.1	0.8
1560	4/15/2002	2	33.0	27.6	5.4
1560	10/21/2002	2	27.4	25.3	2.1
1570	7/19/1994	2	57.6	59.7	-2.1
1570	11/28/1994	2	57.1	59.0	-1.9
1570	4/25/1995	2	64.6	60.3	4.4
1570	12/7/1995	2	58.8	61.6	-2.7
1570	4/15/1996	2	62.3	61.4	0.9
1570	6/8/1998	2	62.4	58.6	3.8
1570	10/19/1999	2	50.7	47.2	3.5
1570	4/19/2000	2	54.8	48.3	6.5
1570	10/23/2000	2	52.1	49.0	3.2
1570	4/23/2001	2	52.0	48.7	3.4
1570	10/9/2001	2	50.6	47.5	3.1
1570	4/16/2002	2	53.5	45.7	7.7
1570	10/21/2002	2	49.3	44.2	5.1
1572	5/26/1993	2	61.3	63.4	-2.1
1572	11/28/1994	2	61.0	61.7	-0.7
1572	4/25/1995	2	65.9	62.8	3.1
1572	12/14/1995	2	61.6	64.2	-2.6
1572	9/17/1996	2	61.0	64.1	-3.0
1572	1/9/1997	2	68.8	64.0	4.8
1572	6/2/1998	2	66.0	62.7	3.3
1572	10/20/1999	2	58.7	55.5	3.3
1572	4/18/2000	2	60.3	55.3	5.0
1572	10/24/2000	2	59.4	55.8	3.6
1572	4/24/2001	2	57.9	55.3	2.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1572	10/8/2001	2	57.6	54.2	3.3
1572	4/16/2002	2	59.0	52.4	6.7
1572	10/21/2002	2	56.7	51.0	5.7
1586	6/20/1995	2	49.2	45.5	3.6
1586	11/30/1995	2	44.9	46.6	-1.7
1586	7/14/1997	2	44.8	45.1	-0.3
1586	5/4/2000	2	38.0	34.7	3.3
1586	2/2/2001	2	36.1	35.3	0.9
1586	5/9/2002	2	37.5	30.1	7.4
1586	11/20/2002	2	32.7	27.9	4.8
1592	6/5/1995	2	45.9	41.4	4.5
1592	12/1/1995	2	41.3	42.6	-1.3
1592	11/6/1998	2	38.2	41.0	-2.8
1592	10/19/1999	2	33.8	33.4	0.5
1592	1/28/2000	2	33.6	32.2	1.4
1592	4/19/2000	2	35.7	32.5	3.2
1592	10/23/2000	2	35.3	33.1	2.2
1592	4/23/2001	2	33.7	32.2	1.5
1592	10/8/2001	2	32.8	30.4	2.5
1592	4/16/2002	2	36.1	27.9	8.2
1592	10/21/2002	2	29.6	25.6	4.0
3179	12/7/1988	2	111.8	115.1	-3.2
3179	8/2/1989	2	112.3	111.7	0.6
3179	10/25/1989	2	111.0	111.2	-0.2
3179	4/18/1990	2	108.8	109.8	-1.1
3179	10/11/1990	2	107.1	108.7	-1.6
3179	4/24/1991	2	107.5	108.1	-0.7
3179	7/15/1991	2	107.2	108.1	-0.9
3179	10/16/1991	2	106.2	108.1	-1.8
3179	1/8/1992	2	105.5	108.1	-2.5
3179	6/23/1992	2	106.1	108.0	-1.9
3179	10/19/1992	2	104.4	107.9	-3.5
3179	1/21/1993	2	104.8	107.9	-3.0
3179	4/22/1993	2	108.6	108.0	0.6
3179	10/19/1993	2	107.1	108.4	-1.4
3179	2/1/1994	2	106.3	108.6	-2.3
3179	4/18/1994	2	106.1	108.3	-2.2
3179	10/26/1994	2	103.8	107.1	-3.3
3179	4/27/1995	2	111.2	106.8	4.4
3179	10/26/1995	2	110.1	108.8	1.3
3179	4/17/1996	2	109.5	110.0	-0.5
3179	10/21/1996	2	107.9	111.0	-3.1
3179	1/13/1997	2	108.7	111.2	-2.5
3179	4/16/1997	2	111.4	110.5	0.9
3179	10/9/1997	2	108.9	109.3	-0.4
3179	6/5/1998	2	115.3	110.1	5.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3179	10/21/1998	2	112.2	112.1	0.1
3179	4/6/1999	2	110.8	110.6	0.2
3179	10/19/1999	2	107.1	107.0	0.1
3179	2/1/2000	2	105.9	105.5	0.3
3179	4/18/2000	2	110.4	105.5	4.8
3179	10/24/2000	2	107.2	106.0	1.1
3179	1/16/2001	2	105.6	106.2	-0.6
3179	4/24/2001	2	105.1	105.8	-0.7
3179	10/10/2001	2	103.7	104.8	-1.1
3179	1/31/2002	2	104.3	104.4	-0.1
3179	10/28/2002	2	102.7	102.2	0.5
3189	12/9/1988	2	108.4	109.1	-0.7
3189	3/22/1989	2	110.3	107.5	2.8
3189	6/30/1989	2	110.4	106.7	3.7
3189	10/26/1989	2	108.4	106.0	2.4
3189	10/22/1990	2	104.2	102.5	1.7
3189	2/12/1991	2	103.9	102.0	1.8
3189	8/1/1991	2	106.1	102.1	4.1
3189	10/27/1991	2	103.6	102.1	1.5
3189	4/14/1992	2	104.9	102.0	2.9
3189	8/6/1992	2	103.3	101.9	1.4
3189	10/16/1992	2	103.2	101.9	1.3
3189	7/29/1993	2	107.3	102.3	5.0
3189	10/19/1993	2	105.3	102.5	2.8
3189	2/1/1994	2	104.0	102.5	1.5
3189	4/20/1994	2	105.2	102.0	3.1
3189	1/16/1995	2	103.0	100.3	2.7
3189	4/27/1995	2	109.1	101.0	8.1
3189	7/25/1995	2	109.1	102.0	7.2
3189	10/26/1995	2	107.1	103.0	4.1
3189	1/22/1996	2	105.4	103.9	1.5
3189	4/16/1996	2	107.5	104.2	3.2
3189	7/16/1996	2	107.5	104.6	2.9
3189	10/23/1996	2	106.3	105.1	1.2
3189	1/7/1997	2	106.9	105.3	1.6
3189	4/16/1997	2	108.9	104.4	4.5
3189	7/14/1997	2	107.1	103.8	3.4
3189	10/8/1997	2	107.2	103.2	4.0
3189	1/20/1998	2	106.5	102.2	4.3
3189	6/5/1998	2	112.2	103.3	8.9
3189	10/21/1998	2	109.8	105.3	4.5
3189	1/18/1999	2	106.7	105.5	1.2
3189	4/5/1999	2	113.7	103.1	10.6
3189	7/26/1999	2	105.7	100.7	4.9
3189	10/19/1999	2	104.2	99.1	5.1
3189	1/10/2000	2	103.7	97.9	5.9

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3189	4/17/2000	2	108.2	98.1	10.2
3189	7/5/2000	2	106.8	98.3	8.5
3189	10/23/2000	2	104.3	98.6	5.7
3189	1/22/2001	2	102.2	98.4	3.8
3189	4/24/2001	2	101.4	97.7	3.7
3189	7/23/2001	2	100.9	97.1	3.8
3189	1/14/2002	2	100.4	96.3	4.0
3189	4/15/2002	2	101.3	96.5	4.8
3189	7/15/2002	2	100.4	95.7	4.7
3189	10/28/2002	2	99.6	94.6	5.0
3310	4/18/1990	2	118.7	119.0	-0.3
3310	10/8/1990	2	116.1	117.8	-1.7
3310	4/24/1991	2	116.7	117.1	-0.3
3310	10/15/1991	2	116.0	116.9	-1.0
3310	4/14/1992	2	116.2	116.6	-0.4
3310	8/6/1992	2	114.5	116.5	-2.0
3310	10/19/1992	2	113.5	116.4	-2.9
3310	1/18/1993	2	113.3	116.4	-3.1
3310	6/28/1993	2	116.4	116.7	-0.3
3310	10/19/1993	2	115.1	117.0	-1.9
3310	4/18/1994	2	114.4	116.9	-2.5
3310	10/26/1994	2	112.6	115.7	-3.1
3310	4/27/1995	2	119.2	115.2	3.9
3310	10/25/1995	2	118.4	117.2	1.2
3310	4/15/1996	2	118.8	118.9	-0.1
3310	10/22/1996	2	118.3	120.1	-1.8
3310	1/16/1997	2	118.6	120.4	-1.7
3310	4/16/1997	2	121.8	119.7	2.0
3310	10/9/1997	2	118.7	118.5	0.1
3310	4/22/1998	2	125.2	118.9	6.3
3310	10/21/1998	2	123.3	121.7	1.6
3310	4/6/1999	2	122.2	120.9	1.3
3310	10/19/1999	2	118.5	117.5	1.0
3310	4/18/2000	2	120.5	116.1	4.4
3310	10/24/2000	2	118.5	116.6	1.9
3310	4/23/2001	2	117.4	116.5	0.8
3310	10/10/2001	2	115.5	115.6	-0.1
3310	4/16/2002	2	116.0	114.2	1.7
3310	10/28/2002	2	114.1	112.4	1.7
194	11/20/1984	4	137.6	148.3	-10.7
194	4/11/1985	4	137.3	146.1	-8.8
194	8/28/1985	4	135.2	144.4	-9.2
194	9/23/1986	4	138.4	141.5	-3.1
194	12/10/1986	4	137.0	141.3	-4.4
194	6/17/1987	4	136.9	141.0	-4.1
194	9/1/1987	4	135.9	140.7	-4.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
194	11/12/1987	4	135.8	140.4	-4.7
194	8/18/1988	4	135.2	140.9	-5.7
194	12/7/1988	4	134.5	140.3	-5.8
194	3/23/1989	4	131.2	138.5	-7.3
194	10/26/1989	4	133.5	136.9	-3.5
194	4/20/1990	4	133.1	135.9	-2.9
194	10/11/1990	4	131.7	135.0	-3.2
194	4/25/1991	4	131.5	134.4	-2.9
194	7/9/1991	4	130.6	134.4	-3.8
194	10/16/1991	4	129.7	134.4	-4.6
194	1/9/1992	4	129.1	134.3	-5.2
194	4/14/1992	4	130.3	134.3	-4.0
194	7/6/1992	4	129.6	134.3	-4.6
194	10/20/1992	4	128.6	134.2	-5.7
194	1/14/1993	4	128.6	134.3	-5.7
194	4/23/1993	4	131.4	134.5	-3.1
194	10/19/1993	4	129.1	134.9	-5.8
194	4/20/1994	4	128.7	135.0	-6.3
194	10/26/1994	4	127.9	134.2	-6.2
194	4/28/1995	4	134.0	133.9	0.1
194	10/26/1995	4	132.4	135.6	-3.3
194	4/16/1996	4	133.7	137.1	-3.4
194	10/24/1996	4	132.5	138.3	-5.8
194	4/15/1997	4	135.5	138.2	-2.7
194	10/8/1997	4	133.5	137.1	-3.6
194	4/23/1998	4	138.6	137.5	1.1
194	10/23/1998	4	136.0	139.9	-4.0
194	1/8/1999	4	135.7	140.8	-5.1
194	4/8/1999	4	137.0	139.6	-2.6
194	10/19/1999	4	129.2	136.7	-7.5
194	4/20/2000	4	136.4	135.5	0.9
194	10/25/2000	4	134.5	135.9	-1.4
194	10/9/2001	4	132.8	135.3	-2.5
194	1/15/2002	4	133.8	134.8	-0.9
194	4/16/2002	4	133.3	134.0	-0.8
194	10/28/2002	4	132.1	132.4	-0.4
404	6/17/1987	4	110.5	110.6	-0.1
404	11/12/1987	4	108.0	110.1	-2.2
404	2/16/1988	4	109.4	111.3	-1.9
404	10/28/1988	4	107.3	110.5	-3.2
404	11/10/1989	4	106.5	106.0	0.5
404	1/29/1990	4	102.6	105.5	-2.9
404	4/18/1990	4	100.9	104.9	-4.1
404	10/9/1990	4	98.7	103.9	-5.3
404	4/15/1992	4	99.1	103.5	-4.4
404	7/23/1992	4	97.4	103.4	-6.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
404	10/19/1992	4	96.6	103.4	-6.8
404	2/5/1993	4	98.6	103.4	-4.8
404	7/29/1993	4	100.9	103.8	-2.8
404	10/19/1993	4	100.1	103.9	-3.8
404	2/1/1994	4	98.7	104.0	-5.3
404	4/20/1994	4	98.5	103.6	-5.1
404	2/3/1995	4	98.9	101.8	-2.9
404	7/24/1995	4	103.9	103.2	0.7
404	10/25/1995	4	101.5	104.2	-2.7
404	4/16/1996	4	101.6	105.2	-3.6
404	10/22/1996	4	99.8	105.9	-6.2
404	1/7/1997	4	100.3	106.1	-5.8
404	4/16/1997	4	103.4	105.3	-1.9
404	10/9/1997	4	101.6	104.2	-2.6
404	4/21/1998	4	107.1	104.5	2.5
404	10/21/1998	4	104.0	107.0	-3.0
404	1/18/1999	4	101.5	106.9	-5.4
404	4/5/1999	4	102.6	104.6	-2.0
404	7/26/1999	4	100.6	102.4	-1.8
404	10/19/1999	4	99.6	101.0	-1.4
404	2/7/2000	4	98.2	99.5	-1.3
404	7/5/2000	4	100.4	99.8	0.6
404	10/24/2000	4	98.8	100.1	-1.3
404	1/23/2001	4	97.3	100.1	-2.9
404	4/25/2001	4	96.7	99.7	-3.0
404	7/24/2001	4	95.9	99.1	-3.3
404	10/10/2001	4	95.6	98.6	-3.1
404	1/31/2002	4	95.9	98.8	-2.9
404	4/15/2002	4	96.6	98.4	-1.7
404	7/15/2002	4	95.6	97.5	-1.9
404	10/28/2002	4	94.9	96.6	-1.7
442	4/23/1986	4	80.1	71.4	8.7
442	9/23/1986	4	75.1	71.1	4.0
442	6/17/1987	4	73.2	70.1	3.1
442	9/1/1987	4	70.2	69.9	0.3
442	11/13/1987	4	69.7	69.6	0.0
442	2/16/1988	4	69.8	68.9	0.9
442	7/12/1988	4	68.2	67.3	0.9
442	12/7/1988	4	66.3	65.7	0.6
442	3/22/1989	4	67.2	65.2	2.0
442	10/25/1989	4	64.2	64.1	0.1
442	4/20/1990	4	67.1	63.2	3.9
442	10/9/1990	4	64.0	62.4	1.7
442	4/24/1991	4	63.7	62.3	1.4
442	12/18/1991	4	62.6	62.7	-0.1
442	6/3/1992	4	63.1	62.6	0.5

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
442	11/8/1992	4	62.2	62.5	-0.2
442	4/22/1993	4	65.8	62.8	3.0
442	10/19/1993	4	63.2	63.3	-0.2
442	4/18/1994	4	62.7	62.2	0.5
442	10/24/1994	4	59.2	60.2	-1.0
442	6/27/1995	4	67.1	62.3	4.7
442	10/23/1995	4	64.7	63.9	0.8
442	4/15/1996	4	67.1	64.7	2.4
442	10/21/1996	4	63.1	65.1	-2.0
442	4/14/1997	4	68.5	64.2	4.2
442	10/6/1997	4	64.3	62.9	1.4
442	5/22/1998	4	71.5	64.9	6.6
442	10/21/1998	4	69.5	67.2	2.4
442	4/6/1999	4	70.0	65.3	4.7
442	10/18/1999	4	64.4	61.0	3.4
442	4/17/2000	4	65.1	59.8	5.2
442	7/12/2000	4	65.3	60.0	5.3
442	10/23/2000	4	63.8	60.2	3.5
442	1/10/2001	4	63.3	60.2	3.1
442	4/24/2001	4	62.8	59.1	3.7
442	10/9/2001	4	60.0	57.2	2.8
442	4/16/2002	4	62.4	50.1	12.3
442	10/21/2002	4	58.8	48.1	10.7
1163	2/4/1983	4	92.2	103.7	-11.5
1163	10/4/1983	4	97.0	105.9	-8.9
1163	6/17/1987	4	88.3	95.1	-6.8
1163	9/2/1987	4	86.6	94.8	-8.3
1163	12/3/1987	4	84.8	94.6	-9.8
1163	7/12/1988	4	84.6	92.7	-8.0
1163	3/22/1989	4	83.7	91.8	-8.1
1163	8/16/1989	4	84.6	91.3	-6.6
1163	1/12/1990	4	83.3	90.7	-7.4
1163	4/19/1990	4	84.9	90.3	-5.4
1163	10/9/1990	4	82.7	89.5	-6.8
1163	2/4/1991	4	81.8	89.3	-7.5
1163	7/9/1991	4	79.9	89.5	-9.6
1163	10/29/1991	4	80.7	89.6	-8.9
1163	4/14/1992	4	82.9	89.4	-6.5
1163	7/22/1992	4	83.2	89.4	-6.2
1163	10/19/1992	4	80.6	89.3	-8.7
1163	7/29/1993	4	83.9	90.0	-6.2
1163	10/20/1993	4	82.3	90.2	-7.9
1163	2/1/1994	4	82.3	89.7	-7.4
1163	4/18/1994	4	81.7	88.8	-7.1
1163	7/18/1994	4	80.7	88.1	-7.3
1163	10/26/1994	4	79.7	87.4	-7.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1163	4/24/1995	4	92.1	89.3	2.8
1163	10/25/1995	4	88.1	91.3	-3.2
1163	1/23/1996	4	86.5	92.1	-5.6
1163	5/7/1996	4	90.0	92.3	-2.3
1163	10/22/1996	4	86.9	92.7	-5.8
1163	1/15/1997	4	88.9	92.6	-3.7
1163	4/16/1997	4	91.9	91.5	0.4
1163	10/7/1997	4	87.0	90.4	-3.4
1163	7/21/1998	4	95.3	93.2	2.1
1163	10/21/1998	4	91.4	94.3	-2.9
1163	1/19/1999	4	90.1	93.3	-3.2
1163	4/6/1999	4	92.0	90.2	1.8
1163	7/13/1999	4	89.8	88.0	1.8
1163	10/21/1999	4	86.7	86.2	0.4
1163	1/11/2000	4	85.3	85.0	0.3
1163	4/18/2000	4	89.1	85.2	3.9
1163	10/24/2000	4	87.8	85.8	1.9
1163	1/22/2001	4	86.7	86.2	0.5
1163	4/24/2001	4	86.6	85.6	0.9
1163	10/8/2001	4	84.3	84.5	-0.2
1163	1/15/2002	4	82.7	83.4	-0.7
1163	4/15/2002	4	85.4	82.1	3.4
1163	10/22/2002	4	82.6	80.2	2.3
1364	4/24/1986	4	82.8	82.2	0.7
1364	9/23/1986	4	78.8	82.0	-3.2
1364	12/11/1986	4	77.4	81.9	-4.4
1364	6/17/1987	4	77.6	80.8	-3.2
1364	9/2/1987	4	76.3	80.5	-4.3
1364	11/16/1987	4	75.0	80.3	-5.3
1364	2/16/1988	4	75.4	79.6	-4.2
1364	7/12/1988	4	74.2	78.4	-4.2
1364	12/7/1988	4	72.6	77.2	-4.6
1364	3/23/1989	4	74.0	77.0	-3.0
1364	7/20/1990	4	72.9	75.2	-2.3
1364	10/8/1990	4	72.2	74.9	-2.7
1364	7/30/1991	4	71.3	75.0	-3.7
1364	4/14/1992	4	71.7	75.2	-3.5
1364	7/22/1992	4	71.1	75.1	-4.0
1364	10/19/1992	4	70.1	75.1	-5.0
1364	2/3/1993	4	70.9	75.2	-4.3
1364	7/29/1993	4	72.2	75.7	-3.5
1364	10/20/1993	4	70.7	75.8	-5.1
1364	2/1/1994	4	71.4	75.5	-4.1
1364	4/18/1994	4	70.3	74.7	-4.4
1364	7/18/1994	4	68.9	73.9	-5.0
1364	4/25/1995	4	74.4	74.8	-0.4

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1364	1/23/1996	4	73.6	77.2	-3.6
1364	4/16/1996	4	74.6	77.3	-2.7
1364	7/15/1996	4	70.7	77.4	-6.7
1364	10/21/1996	4	68.9	77.6	-8.7
1364	1/9/1997	4	71.8	77.5	-5.8
1364	4/16/1997	4	73.4	76.4	-3.0
1364	7/24/1997	4	70.8	75.7	-4.9
1364	10/31/1997	4	71.7	75.2	-3.5
1364	1/14/1998	4	71.6	75.1	-3.5
1364	4/21/1998	4	77.8	76.5	1.2
1364	7/23/1998	4	76.3	77.6	-1.4
1364	10/23/1998	4	73.1	78.7	-5.5
1364	1/19/1999	4	73.7	77.7	-4.0
1364	4/19/1999	4	75.3	74.3	1.0
1364	7/29/1999	4	70.7	72.1	-1.5
1364	10/19/1999	4	68.5	70.6	-2.2
1364	1/10/2000	4	69.3	69.5	-0.2
1364	4/25/2000	4	72.4	70.0	2.4
1364	7/5/2000	4	71.7	70.2	1.5
1364	10/24/2000	4	70.6	70.5	0.1
1364	1/22/2001	4	70.0	70.7	-0.7
1364	4/24/2001	4	69.9	70.0	-0.1
1364	7/22/2001	4	66.6	69.4	-2.7
1364	10/9/2001	4	65.4	68.7	-3.4
1364	1/28/2002	4	69.0	66.7	2.3
1364	5/1/2002	4	67.8	65.3	2.5
1364	7/11/2002	4	65.6	64.6	1.0
1364	10/22/2002	4	70.8	63.6	7.2
1376	4/24/1986	4	80.9	90.7	-9.8
1376	6/17/1987	4	78.9	89.6	-10.8
1376	9/1/1987	4	79.4	89.4	-10.0
1376	11/17/1987	4	78.3	89.2	-10.9
1376	2/16/1988	4	78.1	88.8	-10.7
1376	7/12/1988	4	79.1	88.0	-8.9
1376	12/7/1988	4	77.4	87.1	-9.7
1376	4/7/1989	4	78.3	86.7	-8.4
1376	10/25/1989	4	80.0	86.1	-6.1
1376	4/18/1990	4	79.0	85.4	-6.4
1376	10/8/1990	4	77.5	84.7	-7.2
1376	7/3/1991	4	77.0	84.8	-7.8
1376	11/1/1991	4	77.4	84.8	-7.4
1376	1/21/1992	4	77.2	84.9	-7.7
1376	4/14/1992	4	77.1	84.9	-7.8
1376	8/11/1992	4	78.3	84.8	-6.6
1376	11/24/1992	4	76.7	84.8	-8.1
1376	7/29/1993	4	79.3	85.3	-5.9

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1376	10/20/1993	4	78.6	85.4	-6.8
1376	4/19/1994	4	77.1	84.5	-7.4
1376	7/19/1994	4	77.7	83.9	-6.2
1376	10/24/1994	4	76.7	83.4	-6.6
1376	4/25/1995	4	80.8	84.6	-3.8
1376	7/20/1995	4	84.1	85.3	-1.2
1376	10/24/1995	4	78.1	86.1	-8.0
1376	4/16/1996	4	80.3	86.4	-6.1
1376	7/16/1996	4	78.4	86.5	-8.1
1376	10/22/1996	4	77.9	86.6	-8.7
1376	1/9/1997	4	86.1	86.6	-0.5
1376	4/15/1997	4	78.6	85.6	-7.1
1376	10/7/1997	4	77.6	84.8	-7.2
1376	1/14/1998	4	79.9	84.4	-4.5
1376	7/31/1998	4	79.3	86.0	-6.7
1376	10/21/1998	4	77.6	86.8	-9.2
1376	1/19/1999	4	77.5	83.8	-6.3
1376	4/6/1999	4	78.5	80.1	-1.6
1376	7/27/1999	4	78.3	78.1	0.2
1376	10/21/1999	4	77.4	76.8	0.5
1376	1/11/2000	4	76.7	75.9	0.8
1376	4/18/2000	4	78.6	76.2	2.5
1376	7/20/2000	4	78.0	76.4	1.6
1376	10/24/2000	4	77.2	76.7	0.5
1376	1/22/2001	4	76.5	76.8	-0.4
1376	4/24/2001	4	76.4	76.3	0.1
1376	10/8/2001	4	76.1	75.3	0.8
1376	1/15/2002	4	76.2	74.5	1.7
1376	4/15/2002	4	77.8	73.4	4.4
1376	10/21/2002	4	76.2	71.9	4.3
1379	4/24/1986	4	87.6	90.0	-2.4
1379	9/23/1986	4	85.1	89.8	-4.7
1379	12/11/1986	4	83.8	89.7	-5.9
1379	6/17/1987	4	83.6	88.9	-5.3
1379	9/1/1987	4	83.1	88.7	-5.6
1379	11/17/1987	4	82.2	88.5	-6.3
1379	2/16/1988	4	82.0	88.0	-5.9
1379	7/12/1988	4	81.8	87.1	-5.3
1379	12/7/1988	4	80.4	86.2	-5.8
1379	4/7/1989	4	81.0	85.8	-4.8
1379	10/25/1989	4	81.7	85.2	-3.5
1379	4/18/1990	4	81.5	84.5	-3.0
1379	10/8/1990	4	79.9	83.8	-3.8
1379	8/7/1991	4	79.7	83.9	-4.2
1379	11/4/1991	4	79.0	83.9	-5.0
1379	1/22/1992	4	78.7	84.0	-5.3

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1379	4/14/1992	4	79.5	83.9	-4.4
1379	10/19/1992	4	78.5	83.9	-5.3
1379	7/29/1993	4	81.3	84.4	-3.1
1379	10/18/1993	4	80.4	84.5	-4.2
1379	4/19/1994	4	78.9	83.5	-4.6
1379	7/19/1994	4	78.6	82.9	-4.3
1379	10/24/1994	4	77.8	82.3	-4.6
1379	4/24/1995	4	83.2	83.7	-0.5
1379	7/19/1995	4	84.2	84.5	-0.3
1379	10/24/1995	4	81.0	85.3	-4.3
1379	4/16/1996	4	82.0	85.7	-3.7
1379	7/15/1996	4	81.3	85.8	-4.5
1379	10/22/1996	4	79.6	86.0	-6.4
1379	1/9/1997	4	83.9	85.9	-2.0
1379	4/15/1997	4	82.7	84.9	-2.2
1379	10/7/1997	4	79.7	84.0	-4.3
1379	1/14/1998	4	80.2	83.5	-3.3
1379	4/21/1998	4	84.6	84.3	0.3
1379	8/3/1998	4	84.1	85.3	-1.1
1379	10/21/1998	4	79.7	86.0	-6.3
1379	1/19/1999	4	79.6	82.4	-2.8
1379	4/6/1999	4	80.4	78.2	2.2
1379	8/4/1999	4	78.7	75.9	2.8
1379	10/20/1999	4	77.1	74.8	2.3
1379	1/11/2000	4	77.0	73.7	3.3
1379	4/18/2000	4	79.5	73.9	5.6
1379	7/21/2000	4	78.6	74.2	4.4
1379	10/24/2000	4	77.8	74.4	3.3
1379	1/22/2001	4	77.1	74.7	2.5
1379	4/24/2001	4	77.0	74.2	2.8
1379	10/8/2001	4	75.5	73.1	2.4
1379	1/15/2002	4	76.3	72.2	4.1
1379	4/15/2002	4	77.4	71.1	6.3
1379	10/21/2002	4	75.1	69.5	5.6
1385	4/24/1986	4	97.2	99.8	-2.6
1385	9/23/1986	4	94.0	99.6	-5.6
1385	9/3/1987	4	91.9	98.7	-6.7
1385	11/17/1987	4	90.7	98.5	-7.7
1385	2/16/1988	4	90.6	98.3	-7.7
1385	5/3/1988	4	90.5	98.0	-7.5
1385	7/13/1988	4	90.2	97.6	-7.4
1385	12/7/1988	4	88.9	96.8	-7.9
1385	3/23/1989	4	89.8	95.9	-6.1
1385	10/27/1989	4	89.8	95.0	-5.2
1385	4/18/1990	4	89.0	94.1	-5.1
1385	10/9/1990	4	87.8	93.3	-5.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1385	2/4/1991	4	86.8	93.1	-6.2
1385	7/23/1991	4	88.2	93.2	-5.0
1385	10/25/1991	4	87.2	93.3	-6.1
1385	4/14/1992	4	87.7	93.3	-5.5
1385	7/24/1992	4	87.9	93.2	-5.4
1385	10/19/1992	4	86.5	93.2	-6.7
1385	2/1/1993	4	87.6	93.3	-5.7
1385	7/29/1993	4	89.6	93.6	-4.1
1385	10/20/1993	4	88.4	93.8	-5.4
1385	2/1/1994	4	87.8	93.6	-5.8
1385	4/18/1994	4	87.2	93.0	-5.8
1385	7/18/1994	4	86.8	92.4	-5.6
1385	11/8/1994	4	85.9	91.7	-5.9
1385	4/25/1995	4	91.5	92.7	-1.1
1385	10/26/1995	4	89.2	94.3	-5.2
1385	1/22/1996	4	88.1	94.8	-6.7
1385	5/10/1996	4	90.0	94.9	-4.9
1385	10/21/1996	4	88.1	95.3	-7.2
1385	1/28/1997	4	92.5	95.1	-2.6
1385	4/16/1997	4	90.8	94.5	-3.7
1385	7/15/1997	4	89.1	93.9	-4.8
1385	10/7/1997	4	88.1	93.5	-5.4
1385	1/14/1998	4	88.3	93.1	-4.9
1385	4/21/1998	4	93.0	94.0	-1.1
1385	8/3/1998	4	92.3	95.2	-2.8
1385	10/21/1998	4	90.5	96.0	-5.5
1385	1/19/1999	4	89.1	94.6	-5.6
1385	4/6/1999	4	90.0	91.7	-1.8
1385	8/9/1999	4	88.3	89.4	-1.2
1385	10/20/1999	4	85.2	88.3	-3.1
1385	1/10/2000	4	86.6	87.3	-0.6
1385	4/19/2000	4	87.4	87.4	-0.1
1385	7/10/2000	4	88.9	87.7	1.2
1385	10/24/2000	4	87.6	88.0	-0.4
1385	1/22/2001	4	80.8	88.1	-7.3
1385	4/24/2001	4	86.5	87.5	-1.0
1385	10/9/2001	4	85.6	86.5	-1.0
1385	1/15/2002	4	86.0	85.9	0.1
1385	4/15/2002	4	86.6	85.1	1.5
1385	7/10/2002	4	86.0	84.4	1.6
1385	10/21/2002	4	85.1	83.6	1.5
1420	4/15/1987	4	118.2	117.0	1.2
1420	11/12/1987	4	116.2	116.3	-0.1
1420	5/3/1988	4	117.3	119.5	-2.2
1420	8/10/1988	4	116.2	119.3	-3.1
1420	1/5/1989	4	115.1	118.3	-3.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1420	11/14/1989	4	113.8	113.7	0.1
1420	1/26/1990	4	113.4	113.3	0.2
1420	5/11/1990	4	112.7	112.6	0.1
1420	10/8/1990	4	111.3	111.8	-0.5
1420	4/24/1991	4	112.1	111.3	0.8
1420	8/5/1991	4	110.9	111.2	-0.3
1420	11/6/1991	4	111.8	111.2	0.6
1420	4/16/1992	4	112.0	111.4	0.5
1420	7/17/1992	4	110.8	111.4	-0.6
1420	10/20/1992	4	109.2	111.3	-2.2
1420	1/28/1993	4	110.5	111.3	-0.8
1420	7/30/1993	4	110.7	111.6	-0.9
1420	10/18/1993	4	110.0	111.7	-1.7
1420	2/1/1994	4	109.6	112.1	-2.5
1420	7/18/1994	4	109.9	111.7	-1.8
1420	2/9/1995	4	112.0	109.9	2.0
1420	4/24/1995	4	115.3	110.1	5.2
1420	7/24/1995	4	113.8	110.8	2.9
1420	10/25/1995	4	112.1	111.7	0.4
1420	1/22/1996	4	111.4	112.2	-0.8
1420	4/16/1996	4	113.0	112.5	0.5
1420	7/15/1996	4	112.7	112.9	-0.2
1420	10/21/1996	4	111.5	113.3	-1.8
1420	1/23/1997	4	113.4	113.5	-0.1
1420	4/16/1997	4	114.2	113.0	1.3
1420	10/8/1997	4	112.2	111.9	0.3
1420	4/22/1998	4	116.4	112.0	4.4
1420	10/21/1998	4	114.1	114.2	-0.1
1420	1/19/1999	4	113.7	114.7	-1.0
1420	4/6/1999	4	114.7	113.2	1.5
1420	7/27/1999	4	112.8	111.4	1.5
1420	10/20/1999	4	112.3	110.0	2.2
1420	1/31/2000	4	111.4	108.7	2.7
1420	4/18/2000	4	113.1	108.7	4.4
1420	10/24/2000	4	112.1	109.1	3.0
1420	1/22/2001	4	111.9	109.6	2.3
1420	4/24/2001	4	111.7	109.5	2.2
1420	7/22/2001	4	111.6	109.0	2.6
1420	10/8/2001	4	111.2	108.6	2.6
1420	1/30/2002	4	111.4	107.9	3.5
1420	4/15/2002	4	111.1	107.4	3.7
1420	10/21/2002	4	110.5	105.8	4.6
1470	8/7/1991	4	69.6	74.3	-4.7
1470	11/6/1991	4	69.2	74.4	-5.2
1470	1/21/1992	4	67.9	74.4	-6.5
1470	4/14/1992	4	69.7	74.4	-4.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1470	10/19/1992	4	67.5	74.4	-6.8
1470	4/22/1993	4	70.5	74.7	-4.2
1470	7/29/1993	4	69.8	74.8	-5.0
1470	10/20/1993	4	68.3	74.9	-6.6
1470	4/18/1994	4	67.8	74.0	-6.2
1470	8/17/1994	4	67.0	73.2	-6.2
1470	4/24/1995	4	71.6	74.1	-2.5
1470	10/24/1995	4	69.5	75.7	-6.2
1470	4/16/1996	4	71.3	75.9	-4.6
1470	10/22/1996	4	67.5	76.1	-8.6
1470	1/9/1997	4	73.4	76.0	-2.6
1470	4/16/1997	4	69.8	75.0	-5.3
1470	10/7/1997	4	66.5	74.2	-7.7
1470	1/14/1998	4	69.5	73.7	-4.2
1470	4/21/1998	4	72.9	74.4	-1.5
1470	10/21/1998	4	63.8	76.0	-12.2
1470	4/6/1999	4	65.6	68.9	-3.2
1470	8/5/1999	4	62.6	66.5	-3.9
1470	10/20/1999	4	61.0	65.3	-4.3
1470	1/11/2000	4	62.6	64.3	-1.7
1470	7/10/2000	4	63.9	65.0	-1.1
1470	10/24/2000	4	62.7	65.3	-2.6
1470	1/22/2001	4	62.0	65.4	-3.4
1470	4/24/2001	4	62.6	64.9	-2.2
1470	7/22/2001	4	59.2	64.3	-5.2
1470	10/8/2001	4	58.8	63.8	-5.0
1470	1/15/2002	4	61.1	62.7	-1.6
1470	4/15/2002	4	64.1	61.3	2.8
1470	7/25/2002	4	60.1	60.3	-0.3
1470	10/21/2002	4	57.7	59.7	-2.0
1476	8/6/1991	4	97.2	98.0	-0.8
1476	11/5/1991	4	95.5	98.0	-2.5
1476	4/27/1992	4	96.5	97.9	-1.4
1476	7/17/1992	4	95.9	97.8	-1.9
1476	1/28/1993	4	95.3	97.9	-2.5
1476	7/29/1993	4	98.5	98.3	0.2
1476	10/20/1993	4	97.1	98.5	-1.4
1476	2/3/1994	4	96.2	98.2	-2.0
1476	4/18/1994	4	96.0	97.6	-1.6
1476	7/18/1994	4	95.2	96.9	-1.8
1476	10/26/1994	4	94.0	96.3	-2.3
1476	4/24/1995	4	100.2	97.2	3.0
1476	10/25/1995	4	97.9	99.1	-1.2
1476	1/22/1996	4	96.0	99.8	-3.9
1476	10/22/1996	4	96.5	100.7	-4.2
1476	1/16/1997	4	98.3	100.7	-2.4

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1476	4/16/1997	4	99.9	99.8	0.1
1476	7/15/1997	4	97.4	99.2	-1.8
1476	10/7/1997	4	97.0	98.7	-1.8
1476	4/21/1998	4	102.7	99.2	3.5
1476	10/21/1998	4	100.0	101.5	-1.4
1476	1/19/1999	4	97.9	100.6	-2.7
1476	10/20/1999	4	95.4	94.2	1.2
1476	1/11/2000	4	94.5	93.0	1.6
1476	4/18/2000	4	98.8	93.1	5.7
1476	10/24/2000	4	95.6	93.7	1.9
1476	1/22/2001	4	94.0	93.6	0.4
1476	4/24/2001	4	93.6	93.0	0.6
1476	10/8/2001	4	92.9	91.9	0.9
1476	1/15/2002	4	93.3	91.7	1.6
1476	4/15/2002	4	93.7	91.3	2.4
1476	10/21/2002	4	92.0	89.6	2.4
1482	8/7/1991	4	63.8	64.0	-0.1
1482	11/6/1991	4	62.7	64.0	-1.3
1482	1/22/1992	4	62.2	64.1	-1.8
1482	4/21/1992	4	63.2	64.1	-0.9
1482	10/19/1992	4	61.9	64.0	-2.1
1482	7/30/1993	4	63.9	64.4	-0.5
1482	10/18/1993	4	63.0	64.5	-1.4
1482	4/18/1994	4	61.6	63.7	-2.0
1482	10/24/1994	4	60.6	62.6	-2.0
1482	4/24/1995	4	67.2	63.6	3.5
1482	10/23/1995	4	62.5	64.8	-2.3
1482	4/15/1996	4	65.8	64.9	0.9
1482	10/21/1996	4	61.2	64.9	-3.8
1482	1/9/1997	4	71.0	64.8	6.2
1482	4/14/1997	4	64.2	63.9	0.3
1482	10/6/1997	4	61.2	63.2	-2.0
1482	1/13/1998	4	63.1	62.8	0.2
1482	4/20/1998	4	66.1	63.1	3.1
1482	7/31/1998	4	65.3	63.6	1.7
1482	10/20/1998	4	59.0	64.1	-5.1
1482	1/18/1999	4	58.5	62.2	-3.6
1482	4/5/1999	4	59.5	58.5	1.0
1482	7/26/1999	4	58.3	56.2	2.1
1482	10/18/1999	4	48.4	54.9	-6.5
1482	1/10/2000	4	57.0	54.2	2.8
1482	4/17/2000	4	57.3	55.1	2.1
1482	7/20/2000	4	58.3	55.4	2.9
1482	10/23/2000	4	58.0	55.7	2.3
1482	1/23/2001	4	57.3	55.7	1.7
1482	4/23/2001	4	57.5	55.1	2.4

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1482	7/23/2001	4	56.9	54.5	2.4
1482	10/8/2001	4	56.6	54.0	2.6
1482	1/14/2002	4	57.8	52.9	4.9
1482	4/16/2002	4	58.8	51.6	7.2
1482	7/26/2002	4	57.4	50.7	6.6
1482	10/21/2002	4	55.7	50.1	5.6
1488	7/8/1991	4	69.2	68.9	0.2
1488	11/6/1991	4	68.6	69.0	-0.5
1488	1/21/1992	4	68.2	69.1	-0.9
1488	4/22/1992	4	68.6	69.1	-0.5
1488	10/21/1992	4	68.1	69.1	-1.0
1488	7/29/1993	4	70.3	69.5	0.8
1488	10/20/1993	4	69.4	69.6	-0.1
1488	4/18/1994	4	68.3	68.7	-0.4
1488	8/15/1994	4	68.1	68.0	0.1
1488	10/27/1994	4	62.8	67.6	-4.8
1488	4/25/1995	4	71.8	68.8	3.0
1488	12/6/1995	4	69.6	70.4	-0.8
1488	1/9/1997	4	75.8	70.3	5.5
1488	7/15/1997	4	69.1	68.9	0.2
1488	4/21/1998	4	71.8	68.8	2.9
1488	6/26/2000	4	67.3	61.4	6.0
1488	4/24/2001	4	65.8	61.2	4.6
1488	1/15/2002	4	65.6	59.0	6.6
1488	6/4/2002	4	66.1	57.2	8.9
1488	12/2/2002	4	65.0	55.9	9.1
1507	1/15/1992	4	49.5	47.0	2.5
1507	4/14/1992	4	50.2	47.0	3.2
1507	6/30/1992	4	49.9	46.9	2.9
1507	1/18/1993	4	49.0	46.9	2.1
1507	7/29/1993	4	50.0	47.3	2.7
1507	10/20/1993	4	48.3	47.4	0.9
1507	4/18/1994	4	47.8	46.4	1.4
1507	8/18/1994	4	45.6	45.4	0.2
1507	2/1/1995	4	48.2	44.8	3.5
1507	4/25/1995	4	52.0	45.6	6.4
1507	12/7/1995	4	47.8	47.4	0.4
1507	7/15/1996	4	48.4	47.2	1.2
1507	1/9/1997	4	51.7	47.1	4.7
1507	7/15/1997	4	47.7	45.7	1.9
1507	6/1/1998	4	51.1	45.2	5.9
1507	10/20/1999	4	40.9	38.0	2.9
1507	6/26/2000	4	41.5	37.7	3.8
1507	10/24/2000	4	42.8	38.1	4.6
1507	4/24/2001	4	40.4	37.1	3.3
1507	7/22/2001	4	39.5	36.1	3.4

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1507	10/8/2001	4	39.8	35.3	4.5
1507	4/16/2002	4	42.4	32.7	9.7
1507	10/21/2002	4	36.7	30.7	6.1
1533	4/23/1993	4	62.6	63.4	-0.8
1533	7/30/1993	4	59.0	63.6	-4.6
1533	10/18/1993	4	59.1	63.6	-4.5
1533	4/18/1994	4	56.7	62.7	-5.9
1533	10/27/1994	4	57.6	61.5	-4.0
1533	4/24/1995	4	62.5	62.8	-0.3
1533	1/5/1996	4	60.2	64.3	-4.1
1533	4/22/1996	4	62.0	63.9	-1.9
1533	7/25/1996	4	55.6	63.9	-8.3
1533	10/22/1996	4	55.6	63.9	-8.3
1533	4/15/1997	4	59.3	62.8	-3.5
1533	10/7/1997	4	56.8	62.0	-5.3
1533	4/20/1998	4	63.3	62.2	1.2
1533	7/20/1998	4	59.9	62.6	-2.7
1533	10/20/1998	4	53.4	63.2	-9.7
1533	1/18/1999	4	53.5	61.2	-7.7
1533	4/7/1999	4	54.5	57.3	-2.8
1533	7/26/1999	4	50.7	55.0	-4.4
1533	10/18/1999	4	46.9	53.8	-6.9
1533	1/10/2000	4	51.3	53.0	-1.8
1533	4/19/2000	4	53.4	54.2	-0.7
1533	7/7/2000	4	51.7	54.4	-2.8
1533	10/23/2000	4	50.0	54.7	-4.8
1533	1/22/2001	4	49.3	54.7	-5.4
1533	4/23/2001	4	51.6	54.1	-2.5
1533	7/23/2001	4	45.6	53.5	-7.9
1533	10/9/2001	4	45.5	52.9	-7.4
1533	1/14/2002	4	47.7	51.6	-3.9
1533	4/15/2002	4	52.6	50.2	2.4
1533	7/5/2002	4	45.5	49.4	-3.9
1533	10/21/2002	4	43.7	48.5	-4.9
1540	7/30/1993	4	51.7	53.8	-2.2
1540	10/18/1993	4	50.4	53.9	-3.5
1540	1/12/1994	4	50.0	53.8	-3.8
1540	4/18/1994	4	50.0	53.0	-3.0
1540	7/7/1994	4	48.7	52.4	-3.8
1540	10/27/1994	4	48.3	51.7	-3.4
1540	4/25/1995	4	53.7	52.7	1.0
1540	11/28/1995	4	49.9	54.1	-4.2
1540	2/9/1996	4	50.6	54.0	-3.4
1540	5/9/1997	4	50.3	52.6	-2.3
1540	6/15/1998	4	52.7	51.0	1.7
1540	11/6/1998	4	41.7	51.7	-10.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1540	5/24/1999	4	39.4	42.4	-2.9
1540	8/16/1999	4	38.2	40.6	-2.4
1540	11/3/1999	4	38.0	39.2	-1.2
1540	2/9/2000	4	38.8	39.9	-1.1
1540	5/10/2000	4	41.0	40.6	0.4
1540	8/14/2000	4	39.5	40.9	-1.4
1540	11/16/2000	4	39.8	41.2	-1.4
1540	2/13/2001	4	39.8	41.2	-1.4
1540	5/18/2001	4	39.6	40.5	-0.9
1540	2/5/2002	4	39.4	37.5	1.9
1540	5/9/2002	4	40.5	36.3	4.2
1540	11/15/2002	4	36.7	34.4	2.3
1561	11/22/1993	4	41.2	41.8	-0.6
1561	4/18/1994	4	41.1	41.0	0.1
1561	10/27/1994	4	38.8	39.6	-0.8
1561	4/26/1995	4	43.2	40.0	3.2
1561	6/12/1998	4	42.1	39.2	2.8
1561	7/27/1999	4	33.5	34.1	-0.5
1561	10/18/1999	4	32.3	32.6	-0.3
1561	4/17/2000	4	33.7	31.9	1.8
1561	10/23/2000	4	32.7	32.5	0.2
1561	4/23/2001	4	32.6	31.6	1.0
1561	7/23/2001	4	31.6	30.7	0.9
1561	10/9/2001	4	30.9	29.8	1.1
1561	1/15/2002	4	31.3	28.3	3.0
1561	4/15/2002	4	33.1	26.9	6.2
1561	10/21/2002	4	27.5	24.7	2.8
1573	5/26/1993	4	58.9	61.0	-2.1
1573	11/28/1994	4	57.7	59.0	-1.4
1573	4/25/1995	4	63.6	60.1	3.4
1573	12/14/1995	4	59.1	61.8	-2.7
1573	9/17/1996	4	58.0	61.6	-3.6
1573	1/9/1997	4	65.4	61.5	3.9
1573	10/7/1997	4	58.8	59.9	-1.1
1573	6/2/1998	4	63.3	60.2	3.1
1573	4/6/1999	4	58.3	56.4	1.9
1573	10/20/1999	4	55.3	52.7	2.6
1573	4/18/2000	4	57.2	52.5	4.6
1573	10/24/2000	4	56.5	53.1	3.4
1573	4/24/2001	4	54.5	52.4	2.1
1573	10/8/2001	4	54.1	51.2	2.9
1573	4/16/2002	4	56.1	48.8	7.3
1573	10/21/2002	4	52.6	47.2	5.4
1593	6/6/1995	4	45.4	40.0	5.4
1593	12/1/1995	4	40.9	41.2	-0.3
1593	8/19/1996	4	40.8	41.0	-0.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1593	2/9/1998	4	40.5	38.4	2.1
1593	11/6/1998	4	37.7	39.5	-1.8
1593	10/18/1999	4	33.3	31.6	1.6
1593	1/28/2000	4	33.1	30.7	2.4
1593	4/19/2000	4	34.8	31.0	3.8
1593	10/23/2000	4	34.9	31.6	3.3
1593	4/23/2001	4	33.0	30.6	2.4
1593	10/8/2001	4	32.3	28.7	3.6
1593	4/16/2002	4	35.5	25.9	9.6
1593	10/21/2002	4	28.7	23.7	5.0
3131	11/12/1987	4	110.8	113.2	-2.4
3131	7/12/1988	4	112.1	116.3	-4.2
3131	1/6/1989	4	110.9	115.0	-4.2
3131	10/26/1989	4	109.1	109.7	-0.7
3131	1/26/1990	4	107.4	109.1	-1.7
3131	4/18/1990	4	106.0	108.5	-2.5
3131	7/18/1990	4	105.0	107.9	-2.9
3131	10/9/1990	4	104.0	107.5	-3.5
3131	4/24/1991	4	104.2	106.9	-2.7
3131	8/7/1991	4	103.7	106.9	-3.2
3131	10/28/1991	4	104.2	106.9	-2.7
3131	7/20/1992	4	102.7	107.1	-4.3
3131	10/19/1992	4	101.4	107.0	-5.6
3131	1/28/1993	4	102.4	106.9	-4.5
3131	7/29/1993	4	105.1	107.2	-2.1
3131	10/18/1993	4	104.2	107.4	-3.1
3131	2/1/1994	4	103.2	107.8	-4.6
3131	1/10/1997	4	105.5	109.1	-3.7
3131	4/16/1997	4	108.7	108.5	0.1
3131	10/9/1997	4	106.5	107.4	-0.9
3131	4/22/1998	4	112.4	107.7	4.8
3131	10/22/1998	4	109.0	110.1	-1.1
3131	4/6/1999	4	108.4	108.8	-0.4
3131	7/26/1999	4	106.0	106.7	-0.8
3131	10/20/1999	4	105.0	105.3	-0.3
3131	1/10/2000	4	103.4	104.0	-0.6
3131	7/5/2000	4	106.8	103.8	3.0
3131	10/24/2000	4	104.5	104.1	0.4
3131	1/22/2001	4	113.3	104.6	8.7
3131	4/24/2001	4	102.6	104.4	-1.7
3131	7/23/2001	4	103.2	103.9	-0.7
3131	10/10/2001	4	101.8	103.4	-1.7
3131	1/14/2002	4	102.1	102.9	-0.8
3131	4/15/2002	4	102.4	102.4	0.0
3131	7/15/2002	4	101.5	101.6	-0.1
3131	10/29/2002	4	100.9	100.6	0.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3316	6/12/1990	4	108.0	103.5	4.5
3316	11/1/1990	4	106.7	102.7	4.0
3316	4/24/1991	4	108.5	102.6	5.9
3316	7/16/1991	4	108.3	102.6	5.7
3316	1/7/1992	4	105.5	102.6	2.9
3316	4/14/1992	4	106.4	102.2	4.1
3316	7/10/1992	4	105.3	102.2	3.1
3316	10/16/1992	4	105.3	102.1	3.2
3316	1/18/1993	4	104.8	102.2	2.6
3316	6/30/1993	4	107.7	102.8	5.0
3316	10/19/1993	4	107.5	103.0	4.5
3316	4/19/1994	4	106.6	101.6	5.0
3316	10/28/1994	4	103.7	100.3	3.4
3316	1/12/1995	4	104.3	100.3	4.0
3316	4/27/1995	4	111.1	101.8	9.3
3316	10/26/1995	4	109.0	103.9	5.1
3316	1/22/1996	4	107.5	104.9	2.7
3316	4/16/1996	4	109.8	105.3	4.5
3316	7/15/1996	4	109.7	105.6	4.1
3316	10/23/1996	4	107.8	105.9	1.8
3316	1/7/1997	4	109.0	106.1	2.9
3316	4/15/1997	4	110.9	105.0	5.9
3316	7/15/1997	4	107.8	104.4	3.4
3316	10/9/1997	4	108.8	103.9	5.0
3316	1/20/1998	4	109.3	103.4	5.9
3316	4/21/1998	4	114.4	104.3	10.1
3316	10/21/1998	4	111.4	106.8	4.6
3316	1/18/1999	4	108.0	106.0	1.9
3316	4/5/1999	4	109.1	103.2	5.8
3316	7/26/1999	4	106.8	100.9	5.9
3316	10/19/1999	4	105.6	99.4	6.2
3316	1/10/2000	4	104.5	98.2	6.4
3316	4/17/2000	4	110.1	98.3	11.8
3316	7/5/2000	4	109.3	98.5	10.7
3316	10/23/2000	4	105.5	98.9	6.6
3316	4/23/2001	4	101.6	97.7	3.9
3316	7/23/2001	4	100.2	97.1	3.1
3316	10/9/2001	4	102.8	96.6	6.1
3316	4/15/2002	4	102.5	97.2	5.3
3316	7/15/2002	4	101.3	96.3	5.0
3316	10/25/2002	4	101.0	95.4	5.6
3320	11/6/1990	4	109.2	108.0	1.2
3320	4/24/1991	4	109.7	107.7	2.1
3320	7/10/1991	4	109.8	107.7	2.1
3320	1/8/1992	4	107.5	107.6	-0.2
3320	4/15/1992	4	108.8	107.5	1.4

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3320	7/9/1992	4	108.2	107.4	0.9
3320	10/17/1992	4	107.6	107.3	0.3
3320	1/20/1993	4	106.7	107.3	-0.6
3320	4/21/1993	4	110.8	107.6	3.2
3320	10/18/1993	4	109.6	108.1	1.5
3320	4/20/1994	4	108.7	107.2	1.5
3320	10/27/1994	4	106.6	105.8	0.8
3320	1/16/1995	4	106.7	105.5	1.2
3320	4/26/1995	4	113.6	106.7	6.9
3320	7/25/1995	4	113.7	107.9	5.8
3320	10/25/1995	4	112.1	109.1	3.1
3320	4/17/1996	4	112.4	110.6	1.8
3320	10/22/1996	4	111.0	111.5	-0.6
3320	1/17/1997	4	111.2	111.6	-0.5
3320	4/16/1997	4	114.6	110.7	3.9
3320	10/9/1997	4	111.6	109.5	2.1
3320	6/6/1998	4	118.2	111.4	6.8
3320	10/21/1998	4	115.3	113.6	1.7
3320	4/6/1999	4	114.2	111.7	2.6
3320	10/19/1999	4	110.4	108.0	2.4
3320	2/3/2000	4	108.8	106.8	2.0
3320	4/17/2000	4	113.8	107.0	6.9
3320	7/5/2000	4	113.4	107.2	6.2
3320	10/23/2000	4	110.5	107.6	2.9
3320	1/24/2001	4	108.4	107.6	0.8
3320	4/23/2001	4	108.2	107.0	1.1
3320	4/16/2002	4	106.9	104.7	2.2
3320	10/28/2002	4	105.1	102.7	2.4
3448	6/13/1993	4	72.9	79.6	-6.7
3448	4/20/1994	4	75.1	78.6	-3.5
3448	10/27/1994	4	71.1	76.9	-5.8
3448	6/1/1995	4	81.0	79.3	1.7
3448	10/26/1995	4	77.2	81.2	-4.0
3448	4/16/1996	4	80.4	82.1	-1.8
3448	10/23/1996	4	75.8	82.6	-6.8
3448	4/15/1997	4	82.2	81.3	0.9
3448	10/8/1997	4	76.1	80.0	-3.9
3448	6/4/1998	4	85.6	82.5	3.2
3448	10/20/1998	4	82.2	84.4	-2.2
3448	4/5/1999	4	83.1	81.6	1.4
3448	10/19/1999	4	76.5	77.3	-0.8
3448	4/17/2000	4	78.9	76.2	2.7
3448	10/23/2000	4	76.7	76.9	-0.2
3448	1/24/2001	4	75.7	77.3	-1.6
3448	4/23/2001	4	76.5	76.6	-0.2
3448	4/15/2002	4	75.3	71.7	3.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3448	10/28/2002	4	90.4	69.5	20.9
1164	10/4/1983	6	96.7	105.7	-9.0
1164	6/19/1985	6	90.4	96.7	-6.3
1164	6/17/1987	6	87.9	93.5	-5.6
1164	9/2/1987	6	86.4	93.2	-6.9
1164	12/3/1987	6	85.0	92.9	-8.0
1164	7/12/1988	6	84.6	91.3	-6.7
1164	3/22/1989	6	84.2	89.2	-5.0
1164	8/16/1989	6	84.4	88.5	-4.1
1164	1/12/1990	6	83.5	87.8	-4.3
1164	4/19/1990	6	84.8	87.4	-2.6
1164	10/9/1990	6	82.7	86.5	-3.8
1164	2/4/1991	6	81.8	86.2	-4.4
1164	7/9/1991	6	79.7	86.3	-6.6
1164	10/29/1991	6	81.1	86.3	-5.2
1164	4/14/1992	6	83.0	86.2	-3.3
1164	7/22/1992	6	83.1	86.1	-3.1
1164	10/19/1992	6	80.6	86.1	-5.4
1164	2/1/1993	6	81.5	86.1	-4.6
1164	7/29/1993	6	83.6	86.4	-2.8
1164	10/20/1993	6	82.4	86.5	-4.1
1164	2/1/1994	6	82.1	86.3	-4.1
1164	4/18/1994	6	81.4	85.6	-4.2
1164	7/18/1994	6	80.6	84.9	-4.2
1164	10/26/1994	6	79.5	84.1	-4.6
1164	4/24/1995	6	90.0	84.0	6.0
1164	10/25/1995	6	86.2	86.0	0.2
1164	1/23/1996	6	84.6	85.8	-1.2
1164	5/7/1996	6	87.5	85.9	1.7
1164	10/22/1996	6	84.6	86.3	-1.7
1164	1/15/1997	6	87.2	86.2	1.0
1164	4/16/1997	6	89.0	85.4	3.5
1164	10/7/1997	6	85.0	84.4	0.6
1164	7/21/1998	6	91.2	87.2	4.0
1164	10/21/1998	6	88.4	88.3	0.0
1164	1/19/1999	6	87.7	88.4	-0.8
1164	4/6/1999	6	89.3	86.4	2.9
1164	7/13/1999	6	87.0	84.4	2.6
1164	10/21/1999	6	84.7	82.7	2.1
1164	1/11/2000	6	83.7	81.4	2.3
1164	4/18/2000	6	86.6	81.5	5.1
1164	10/24/2000	6	85.1	82.2	2.9
1164	1/22/2001	6	84.7	82.7	2.0
1164	4/24/2001	6	83.3	82.0	1.3
1164	10/8/2001	6	82.0	80.6	1.3
1164	1/15/2002	6	82.9	79.1	3.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1164	4/15/2002	6	84.2	77.6	6.6
1164	10/22/2002	6	81.0	75.7	5.2
1170	10/4/1983	6	52.4	56.5	-4.2
1170	11/20/1984	6	50.9	49.9	1.0
1170	6/20/1985	6	45.1	46.7	-1.6
1170	4/24/1986	6	49.1	43.7	5.4
1170	9/23/1986	6	45.0	43.2	1.8
1170	6/17/1987	6	42.8	42.4	0.5
1170	9/3/1987	6	40.3	42.2	-1.9
1170	2/16/1988	6	43.9	41.2	2.7
1170	7/12/1988	6	39.8	39.3	0.5
1170	12/12/1988	6	40.9	37.3	3.6
1170	8/13/1991	6	36.6	35.3	1.3
1170	11/12/1991	6	37.1	35.3	1.8
1170	1/28/1992	6	38.9	35.3	3.7
1170	4/29/1992	6	38.1	35.0	3.1
1170	9/28/1992	6	35.6	34.7	0.9
1170	4/21/1993	6	38.9	33.9	5.0
1170	7/29/1993	6	29.2	33.4	-4.3
1170	10/20/1993	6	29.0	33.0	-4.1
1170	4/18/1994	6	29.1	31.1	-2.0
1170	8/17/1994	6	25.1	29.3	-4.2
1170	10/27/1994	6	28.6	28.3	0.3
1170	4/25/1995	6	31.6	28.3	3.3
1170	7/5/1995	6	30.2	28.9	1.3
1170	10/25/1995	6	28.6	29.8	-1.3
1170	1/9/1996	6	36.7	30.2	6.5
1170	4/16/1996	6	31.5	29.8	1.7
1170	7/2/1996	6	27.0	29.8	-2.8
1170	10/22/1996	6	30.3	29.8	0.5
1170	4/16/1997	6	29.0	29.5	-0.5
1170	7/25/1997	6	27.2	29.3	-2.0
1170	10/7/1997	6	27.5	29.1	-1.6
1170	1/19/1998	6	32.1	29.2	2.9
1170	4/29/1998	6	32.4	29.9	2.5
1170	7/17/1998	6	28.4	30.5	-2.1
1170	10/20/1998	6	33.0	31.1	1.9
1170	1/4/1999	6	30.8	31.5	-0.7
1170	6/20/2002	6	25.9	17.2	8.7
1170	12/3/2002	6	29.1	15.1	14.1
1365	4/24/1986	6	85.2	83.4	1.7
1365	9/23/1986	6	80.7	83.2	-2.5
1365	12/11/1986	6	79.8	83.1	-3.2
1365	6/17/1987	6	79.7	82.1	-2.4
1365	9/2/1987	6	77.9	81.8	-3.9
1365	11/16/1987	6	76.4	81.6	-5.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1365	2/16/1988	6	76.9	81.0	-4.1
1365	7/12/1988	6	75.6	79.6	-4.1
1365	12/7/1988	6	73.7	78.3	-4.6
1365	3/23/1989	6	75.2	77.7	-2.5
1365	7/20/1990	6	74.1	75.7	-1.5
1365	10/5/1990	6	73.0	75.3	-2.3
1365	7/30/1991	6	72.0	75.1	-3.1
1365	4/14/1992	6	72.7	75.1	-2.3
1365	7/22/1992	6	72.0	75.0	-2.9
1365	10/19/1992	6	70.9	74.9	-4.0
1365	2/3/1993	6	71.9	74.9	-3.0
1365	7/29/1993	6	73.1	75.1	-2.0
1365	10/20/1993	6	71.8	75.2	-3.4
1365	2/1/1994	6	72.3	74.9	-2.6
1365	4/18/1994	6	71.2	74.1	-2.9
1365	1/23/1996	6	72.7	74.4	-1.8
1365	4/16/1996	6	76.1	74.3	1.8
1365	7/15/1996	6	72.4	74.4	-2.1
1365	10/21/1996	6	70.2	74.6	-4.5
1365	1/9/1997	6	72.4	74.6	-2.2
1365	4/16/1997	6	75.4	73.7	1.7
1365	7/24/1997	6	72.1	73.1	-1.1
1365	10/31/1997	6	72.8	72.7	0.1
1365	1/14/1998	6	72.7	72.9	-0.2
1365	4/21/1998	6	79.3	74.5	4.8
1365	7/23/1998	6	78.3	75.6	2.7
1365	10/23/1998	6	75.4	76.7	-1.3
1365	1/19/1999	6	76.0	76.8	-0.8
1365	4/19/1999	6	78.0	74.3	3.7
1365	7/29/1999	6	73.3	72.3	1.0
1365	10/19/1999	6	70.7	70.8	-0.1
1365	1/10/2000	6	71.4	69.6	1.8
1365	4/25/2000	6	74.5	70.0	4.4
1365	7/5/2000	6	74.1	70.3	3.8
1365	10/24/2000	6	72.8	70.7	2.1
1365	1/22/2001	6	72.2	70.9	1.3
1365	4/24/2001	6	72.0	70.1	1.9
1365	7/22/2001	6	68.9	69.3	-0.4
1365	10/9/2001	6	67.2	68.5	-1.3
1365	1/28/2002	6	71.0	65.2	5.9
1365	5/1/2002	6	70.1	64.1	6.0
1365	7/11/2002	6	67.7	63.3	4.4
1365	10/22/2002	6	70.4	62.3	8.0
1378	4/24/1986	6	87.6	91.9	-4.3
1378	6/17/1987	6	84.1	90.8	-6.7
1378	11/17/1987	6	83.1	90.3	-7.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1378	2/16/1988	6	83.0	90.0	-7.0
1378	7/12/1988	6	82.6	89.1	-6.4
1378	12/7/1988	6	81.5	88.0	-6.5
1378	3/23/1989	6	82.4	86.9	-4.5
1378	10/25/1989	6	82.4	86.0	-3.6
1378	4/18/1990	6	81.2	85.2	-4.0
1378	10/8/1990	6	80.7	84.5	-3.8
1378	7/3/1991	6	80.2	84.3	-4.1
1378	10/15/1991	6	80.0	84.3	-4.4
1378	1/21/1992	6	79.6	84.4	-4.7
1378	4/14/1992	6	78.8	84.4	-5.5
1378	11/24/1992	6	79.2	84.2	-5.1
1378	7/29/1993	6	81.6	84.6	-3.0
1378	10/20/1993	6	80.5	84.7	-4.2
1378	4/19/1994	6	79.7	83.9	-4.2
1378	7/19/1994	6	79.1	83.3	-4.1
1378	10/24/1994	6	78.2	82.6	-4.4
1378	4/25/1995	6	82.7	82.7	0.0
1378	7/20/1995	6	83.5	83.5	0.0
1378	10/24/1995	6	81.0	84.3	-3.4
1378	4/16/1996	6	82.3	84.1	-1.8
1378	7/16/1996	6	80.9	84.2	-3.3
1378	10/22/1996	6	79.5	84.4	-4.9
1378	1/9/1997	6	83.1	84.3	-1.3
1378	4/15/1997	6	82.1	83.5	-1.4
1378	10/7/1997	6	79.7	82.6	-2.9
1378	1/14/1998	6	80.5	82.6	-2.1
1378	7/31/1998	6	83.3	84.8	-1.6
1378	10/21/1998	6	80.4	85.7	-5.3
1378	1/19/1999	6	79.4	85.2	-5.8
1378	4/6/1999	6	80.4	83.0	-2.5
1378	7/27/1999	6	78.5	80.9	-2.4
1378	10/21/1999	6	77.2	79.5	-2.3
1378	1/11/2000	6	77.3	78.5	-1.2
1378	4/18/2000	6	79.4	78.9	0.5
1378	7/20/2000	6	78.9	79.2	-0.3
1378	10/24/2000	6	78.1	79.5	-1.4
1378	1/22/2001	6	77.5	79.7	-2.2
1378	4/24/2001	6	77.5	79.0	-1.6
1378	10/8/2001	6	75.7	77.7	-2.1
1378	1/15/2002	6	76.0	76.1	-0.1
1378	4/15/2002	6	77.5	74.5	3.0
1378	10/21/2002	6	75.2	72.8	2.4
1387	4/24/1986	6	93.9	96.7	-2.9
1387	9/23/1986	6	91.7	96.5	-4.8
1387	9/3/1987	6	89.7	95.4	-5.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1387	11/17/1987	6	88.8	95.2	-6.4
1387	2/16/1988	6	88.6	95.0	-6.4
1387	5/3/1988	6	88.4	94.6	-6.2
1387	7/13/1988	6	88.1	94.1	-6.0
1387	12/7/1988	6	87.0	93.1	-6.1
1387	3/23/1989	6	87.7	91.7	-4.0
1387	10/27/1989	6	87.9	90.6	-2.8
1387	4/18/1990	6	87.2	89.8	-2.7
1387	10/9/1990	6	86.0	89.0	-3.1
1387	2/4/1991	6	85.3	88.7	-3.5
1387	7/23/1991	6	85.7	88.8	-3.1
1387	10/25/1991	6	85.2	88.9	-3.7
1387	4/14/1992	6	85.2	88.9	-3.7
1387	7/24/1992	6	85.8	88.9	-3.1
1387	10/19/1992	6	84.5	88.8	-4.3
1387	7/29/1993	6	87.1	89.1	-2.0
1387	10/20/1993	6	86.1	89.2	-3.1
1387	2/1/1994	6	85.3	89.1	-3.7
1387	4/18/1994	6	85.1	88.6	-3.4
1387	7/18/1994	6	84.6	88.0	-3.3
1387	11/8/1994	6	83.8	87.2	-3.4
1387	4/25/1995	6	88.0	87.1	0.9
1387	10/26/1995	6	86.4	88.8	-2.4
1387	1/22/1996	6	85.6	88.7	-3.1
1387	5/10/1996	6	87.1	88.7	-1.5
1387	10/21/1996	6	85.1	89.0	-3.9
1387	1/28/1997	6	88.5	88.7	-0.2
1387	4/16/1997	6	87.5	88.2	-0.7
1387	7/15/1997	6	86.1	87.7	-1.6
1387	10/7/1997	6	85.2	87.3	-2.1
1387	1/14/1998	6	85.4	87.2	-1.8
1387	4/21/1998	6	89.2	88.4	0.8
1387	8/3/1998	6	88.9	89.6	-0.6
1387	10/21/1998	6	87.0	90.4	-3.4
1387	1/19/1999	6	86.0	90.1	-4.1
1387	4/6/1999	6	86.8	88.0	-1.2
1387	8/9/1999	6	84.9	85.7	-0.8
1387	10/20/1999	6	84.0	84.6	-0.5
1387	1/10/2000	6	83.5	83.4	0.0
1387	4/19/2000	6	85.7	83.7	1.9
1387	7/10/2000	6	85.4	84.0	1.4
1387	10/24/2000	6	84.4	84.4	0.0
1387	1/22/2001	6	83.8	84.6	-0.9
1387	4/24/2001	6	83.5	84.0	-0.5
1387	10/9/2001	6	82.1	82.8	-0.7
1387	1/15/2002	6	82.4	81.4	1.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1387	4/15/2002	6	83.3	80.1	3.2
1387	7/10/2002	6	82.7	79.3	3.4
1387	10/21/2002	6	81.4	78.4	3.0
1423	4/15/1987	6	117.1	117.5	-0.4
1423	11/12/1987	6	114.6	116.8	-2.2
1423	5/3/1988	6	115.9	117.8	-1.9
1423	8/10/1988	6	114.8	117.3	-2.5
1423	1/6/1989	6	113.7	116.2	-2.5
1423	11/14/1989	6	112.2	111.4	0.9
1423	1/26/1990	6	111.7	110.9	0.8
1423	5/11/1990	6	111.0	110.3	0.6
1423	10/8/1990	6	109.5	109.6	-0.1
1423	4/24/1991	6	109.7	109.1	0.6
1423	8/5/1991	6	109.0	109.1	-0.1
1423	11/6/1991	6	109.4	109.1	0.3
1423	4/16/1992	6	109.7	109.3	0.4
1423	7/17/1992	6	108.7	109.3	-0.6
1423	10/20/1992	6	107.2	109.3	-2.0
1423	1/28/1993	6	108.0	109.2	-1.2
1423	7/30/1993	6	109.0	109.4	-0.5
1423	10/18/1993	6	107.2	109.6	-2.4
1423	2/1/1994	6	108.0	109.9	-1.9
1423	4/19/1994	6	105.7	109.8	-4.1
1423	7/18/1994	6	108.0	109.4	-1.3
1423	2/9/1995	6	109.5	107.4	2.1
1423	4/24/1995	6	113.0	107.8	5.2
1423	8/7/1995	6	112.0	108.8	3.2
1423	10/25/1995	6	110.4	109.5	0.9
1423	1/22/1996	6	109.7	109.7	0.0
1423	4/16/1996	6	111.1	109.8	1.2
1423	7/15/1996	6	111.0	110.2	0.8
1423	10/21/1996	6	109.7	110.5	-0.8
1423	1/28/1997	6	111.6	110.6	1.0
1423	4/16/1997	6	112.6	110.1	2.5
1423	10/8/1997	6	110.6	109.1	1.5
1423	4/22/1998	6	114.7	110.0	4.6
1423	10/21/1998	6	112.8	112.3	0.6
1423	1/19/1999	6	112.0	112.7	-0.7
1423	4/6/1999	6	112.9	111.2	1.6
1423	7/27/1999	6	111.1	109.4	1.7
1423	10/20/1999	6	110.3	108.0	2.3
1423	1/31/2000	6	109.4	106.7	2.7
1423	4/18/2000	6	112.0	106.8	5.1
1423	10/24/2000	6	110.1	107.4	2.8
1423	1/22/2001	6	109.7	108.0	1.7
1423	4/24/2001	6	109.5	107.7	1.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1423	7/22/2001	6	109.4	107.2	2.2
1423	10/8/2001	6	109.3	106.7	2.6
1423	1/15/2002	6	109.2	106.0	3.3
1423	4/15/2002	6	109.0	105.1	3.9
1423	10/21/2002	6	108.4	103.5	4.8
1477	8/6/1991	6	90.8	91.4	-0.7
1477	11/5/1991	6	90.2	91.4	-1.2
1477	4/27/1992	6	90.6	91.4	-0.9
1477	7/17/1992	6	90.3	91.4	-1.1
1477	1/28/1993	6	89.5	91.3	-1.8
1477	7/29/1993	6	92.4	91.6	0.8
1477	10/20/1993	6	91.2	91.7	-0.6
1477	2/3/1994	6	90.4	91.6	-1.2
1477	4/18/1994	6	90.0	91.1	-1.1
1477	7/18/1994	6	89.5	90.5	-1.0
1477	10/26/1994	6	88.4	89.8	-1.4
1477	4/24/1995	6	92.2	88.4	3.8
1477	10/25/1995	6	90.0	90.2	-0.2
1477	1/22/1996	6	88.3	89.9	-1.7
1477	10/22/1996	6	88.4	90.4	-1.9
1477	1/16/1997	6	90.7	90.3	0.5
1477	4/16/1997	6	92.0	89.5	2.5
1477	7/15/1997	6	89.8	89.0	0.8
1477	10/7/1997	6	88.9	88.5	0.3
1477	4/21/1998	6	94.1	89.9	4.2
1477	10/21/1998	6	91.7	92.1	-0.4
1477	1/19/1999	6	90.1	92.0	-1.9
1477	10/20/1999	6	87.6	86.5	1.1
1477	1/11/2000	6	86.9	85.3	1.6
1477	4/18/2000	6	90.2	85.4	4.8
1477	10/24/2000	6	87.9	86.0	1.9
1477	1/22/2001	6	86.7	86.4	0.3
1477	4/24/2001	6	86.1	85.9	0.2
1477	10/8/2001	6	85.3	84.6	0.7
1477	1/15/2002	6	85.8	83.4	2.4
1477	4/15/2002	6	86.8	82.1	4.6
1477	10/21/2002	6	84.9	80.4	4.5
1489	7/8/1991	6	58.7	61.3	-2.7
1489	11/6/1991	6	59.7	61.4	-1.7
1489	1/21/1992	6	59.7	61.4	-1.7
1489	4/22/1992	6	60.7	61.3	-0.6
1489	10/21/1992	6	59.4	61.1	-1.8
1489	7/29/1993	6	59.0	61.2	-2.2
1489	10/20/1993	6	57.2	61.2	-4.0
1489	4/18/1994	6	57.7	60.0	-2.3
1489	8/15/1994	6	55.2	59.0	-3.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1489	10/27/1994	6	51.1	58.3	-7.3
1489	4/25/1995	6	61.9	58.9	2.9
1489	12/9/1995	6	58.9	60.9	-2.1
1489	1/9/1997	6	57.2	58.5	-1.2
1489	7/15/1997	6	53.4	57.2	-3.8
1489	4/21/1998	6	63.4	58.4	5.0
1489	6/26/2000	6	50.7	53.7	-3.0
1489	4/24/2001	6	50.7	52.8	-2.1
1489	1/15/2002	6	48.1	46.4	1.8
1489	6/4/2002	6	49.3	41.8	7.5
1489	12/2/2002	6	43.2	40.0	3.2
1508	1/15/1992	6	39.7	40.2	-0.5
1508	4/14/1992	6	40.5	40.1	0.4
1508	6/30/1992	6	38.6	39.9	-1.3
1508	1/18/1993	6	39.3	39.7	-0.3
1508	7/29/1993	6	35.2	39.5	-4.3
1508	10/20/1993	6	34.4	39.3	-4.9
1508	4/18/1994	6	34.2	37.8	-3.6
1508	8/18/1994	6	30.9	36.5	-5.6
1508	2/1/1995	6	33.9	35.4	-1.5
1508	4/25/1995	6	37.0	36.1	0.9
1508	12/7/1995	6	37.5	37.8	-0.3
1508	7/15/1996	6	32.1	36.6	-4.5
1508	1/9/1997	6	36.9	36.5	0.4
1508	7/15/1997	6	32.0	35.5	-3.5
1508	6/1/1998	6	36.6	35.2	1.4
1508	10/20/1999	6	27.5	28.2	-0.7
1508	6/26/2000	6	27.7	28.5	-0.8
1508	10/24/2000	6	32.8	29.3	3.5
1508	4/24/2001	6	27.0	27.5	-0.5
1508	7/22/2001	6	24.8	26.2	-1.4
1508	10/8/2001	6	26.5	25.0	1.5
1508	4/16/2002	6	33.6	18.0	15.6
1508	10/21/2002	6	19.8	15.8	4.0
1511	1/14/1992	6	63.7	64.8	-1.1
1511	4/14/1992	6	64.8	64.7	0.1
1511	7/7/1992	6	61.4	64.7	-3.3
1511	10/19/1992	6	61.2	64.6	-3.3
1511	1/14/1993	6	63.2	64.5	-1.3
1511	4/22/1993	6	65.3	64.7	0.6
1511	7/29/1993	6	59.8	64.7	-4.9
1511	10/18/1993	6	61.9	64.8	-2.8
1511	4/18/1994	6	59.5	63.7	-4.2
1511	10/24/1994	6	60.3	62.2	-1.9
1511	2/2/1995	6	63.1	62.1	1.0
1511	4/24/1995	6	65.2	62.9	2.3

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1511	12/8/1995	6	63.4	64.7	-1.3
1511	1/9/1997	6	64.0	63.2	0.8
1511	4/14/1997	6	61.9	62.3	-0.4
1511	7/14/1997	6	59.9	61.9	-2.0
1511	10/6/1997	6	59.4	61.6	-2.2
1511	4/20/1998	6	66.6	62.7	3.9
1511	7/26/1999	6	51.9	58.7	-6.8
1511	6/25/2000	6	51.4	57.5	-6.1
1511	4/23/2001	6	53.4	56.9	-3.5
1511	6/5/2002	6	52.9	48.1	4.8
1511	12/12/2002	6	48.0	46.3	1.7
1521	1/8/1993	6	62.7	60.6	2.2
1521	4/23/1993	6	64.8	60.7	4.1
1521	7/30/1993	6	61.1	60.7	0.4
1521	10/18/1993	6	61.2	60.7	0.5
1521	4/18/1994	6	58.1	59.6	-1.5
1521	8/12/1994	6	55.0	58.7	-3.7
1521	10/27/1994	6	59.3	58.0	1.2
1521	4/24/1995	6	64.4	58.7	5.7
1521	10/23/1995	6	61.7	60.2	1.5
1521	4/15/1996	6	64.2	58.8	5.3
1521	8/2/1996	6	57.1	58.9	-1.8
1521	10/21/1996	6	57.8	58.9	-1.1
1521	1/9/1997	6	62.6	58.8	3.9
1521	4/14/1997	6	60.6	58.0	2.7
1521	10/6/1997	6	58.2	57.2	1.0
1521	1/13/1998	6	62.5	57.2	5.2
1521	4/20/1998	6	66.0	58.3	7.7
1521	7/28/1998	6	62.0	59.1	2.9
1521	10/20/1998	6	53.9	59.7	-5.9
1521	1/18/1999	6	55.2	59.0	-3.8
1521	4/5/1999	6	56.0	56.5	-0.5
1521	7/26/1999	6	51.2	54.2	-3.0
1521	10/19/1999	6	47.1	52.7	-5.6
1521	1/10/2000	6	52.7	51.8	0.9
1521	4/19/2000	6	54.9	52.7	2.1
1521	10/23/2000	6	50.8	53.5	-2.7
1521	1/23/2001	6	48.8	53.3	-4.4
1521	4/23/2001	6	52.5	52.3	0.2
1521	10/8/2001	6	45.0	50.5	-5.5
1521	1/14/2002	6	48.1	46.5	1.5
1521	4/16/2002	6	54.0	42.6	11.4
1521	10/21/2002	6	43.5	40.7	2.8
1527	1/8/1993	6	40.5	43.8	-3.3
1527	4/23/1993	6	42.4	43.9	-1.5
1527	7/30/1993	6	37.8	43.8	-6.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1527	10/18/1993	6	37.2	43.8	-6.6
1527	4/18/1994	6	36.8	42.6	-5.9
1527	10/27/1994	6	34.4	41.0	-6.6
1527	4/24/1995	6	39.0	41.4	-2.4
1527	7/11/1995	6	37.9	41.9	-4.0
1527	1/3/1996	6	39.0	43.0	-4.0
1527	4/15/1996	6	38.8	42.2	-3.4
1527	7/15/1996	6	35.2	42.1	-6.9
1527	10/21/1996	6	35.3	42.1	-6.8
1527	4/14/1997	6	37.3	41.3	-4.0
1527	7/29/1997	6	34.3	40.9	-6.6
1527	10/8/1997	6	34.1	40.6	-6.6
1527	1/20/1998	6	36.7	40.2	-3.5
1527	4/20/1998	6	39.6	40.5	-0.9
1527	7/15/1998	6	34.9	40.9	-6.1
1527	10/20/1998	6	34.2	41.5	-7.3
1527	1/18/1999	6	32.9	40.5	-7.6
1527	4/15/1999	6	33.7	37.7	-4.0
1527	7/26/1999	6	29.3	35.6	-6.3
1527	10/18/1999	6	28.0	34.1	-6.1
1527	1/10/2000	6	29.9	33.0	-3.2
1527	4/20/2000	6	32.0	33.9	-1.9
1527	7/7/2000	6	29.3	34.2	-4.9
1527	10/23/2000	6	32.9	34.7	-1.8
1527	1/23/2001	6	31.0	34.5	-3.5
1527	4/23/2001	6	29.0	33.4	-4.4
1527	7/23/2001	6	27.3	32.2	-4.9
1527	10/8/2001	6	28.3	31.2	-2.9
1527	1/14/2002	6	29.3	25.8	3.5
1527	4/16/2002	6	32.0	20.6	11.3
1527	7/16/2002	6	21.3	19.6	1.7
1527	10/21/2002	6	20.5	18.5	1.9
1530	12/8/1992	6	78.7	81.6	-3.0
1530	4/26/1993	6	81.1	81.9	-0.8
1530	7/29/1993	6	80.7	82.0	-1.3
1530	10/18/1993	6	79.6	82.1	-2.5
1530	4/18/1994	6	79.3	81.2	-1.9
1530	7/18/1994	6	78.2	80.7	-2.5
1530	10/27/1994	6	77.8	80.0	-2.3
1530	4/24/1995	6	81.9	80.6	1.3
1530	7/10/1995	6	81.5	81.3	0.3
1530	11/21/1995	6	80.0	82.3	-2.4
1530	4/15/1996	6	81.2	81.9	-0.7
1530	7/24/1996	6	79.3	82.0	-2.8
1530	10/23/1996	6	78.4	82.1	-3.7
1530	7/29/1997	6	79.3	80.7	-1.4

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1530	1/20/1998	6	80.4	80.5	-0.1
1530	4/20/1998	6	82.3	81.4	0.9
1530	7/22/1998	6	81.9	82.3	-0.4
1530	10/20/1998	6	78.2	83.2	-5.0
1530	1/18/1999	6	77.2	82.6	-5.4
1530	4/19/1999	6	78.6	80.1	-1.5
1530	7/26/1999	6	75.3	78.4	-3.0
1530	10/19/1999	6	74.0	77.0	-3.1
1530	1/10/2000	6	76.0	76.0	0.0
1530	10/23/2000	6	75.5	77.2	-1.7
1588	6/1/1995	6	33.3	32.6	0.7
1588	12/4/1995	6	32.3	33.8	-1.6
1588	6/8/1998	6	33.0	31.4	1.6
1588	11/10/1998	6	33.6	32.1	1.5
1588	10/18/1999	6	21.1	24.5	-3.5
1588	1/27/2000	6	26.3	23.7	2.6
1588	4/19/2000	6	24.7	24.2	0.5
1588	10/23/2000	6	28.5	25.1	3.4
1588	2/8/2001	6	24.0	24.5	-0.5
1588	4/23/2001	6	21.8	23.5	-1.7
1588	10/8/2001	6	22.9	21.0	1.8
1588	10/21/2002	6	14.3	13.8	0.5
3134	11/12/1987	6	110.5	114.1	-3.6
3134	7/12/1988	6	111.5	114.3	-2.9
3134	1/5/1989	6	110.5	112.9	-2.4
3134	10/26/1989	6	108.7	106.9	1.8
3134	1/26/1990	6	105.9	106.3	-0.4
3134	4/18/1990	6	104.4	105.8	-1.4
3134	7/18/1990	6	104.0	105.3	-1.3
3134	10/9/1990	6	102.3	104.8	-2.6
3134	4/24/1991	6	102.8	104.3	-1.5
3134	8/7/1991	6	102.3	104.3	-2.0
3134	10/23/1991	6	103.0	104.3	-1.3
3134	7/20/1992	6	101.4	104.6	-3.2
3134	10/19/1992	6	100.0	104.5	-4.5
3134	1/28/1993	6	101.3	104.4	-3.1
3134	10/18/1993	6	103.2	104.8	-1.6
3134	2/1/1994	6	101.9	105.2	-3.3
3134	4/16/1997	6	107.6	104.6	2.9
3134	10/9/1997	6	105.7	103.6	2.1
3134	4/22/1998	6	110.9	104.9	6.0
3134	10/22/1998	6	109.7	107.3	2.4
3134	4/6/1999	6	106.9	106.2	0.6
3134	7/26/1999	6	105.4	104.3	1.1
3134	10/20/1999	6	104.0	102.9	1.1
3134	1/10/2000	6	102.4	101.6	0.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3134	7/5/2000	6	105.5	101.6	3.9
3134	10/24/2000	6	103.4	102.0	1.4
3134	1/22/2001	6	102.2	102.8	-0.6
3134	4/24/2001	6	101.6	102.5	-0.9
3134	7/23/2001	6	102.0	101.9	0.1
3134	10/10/2001	6	100.8	101.4	-0.7
3134	1/14/2002	6	100.9	100.6	0.3
3134	4/15/2002	6	101.3	99.7	1.6
3134	7/15/2002	6	100.5	98.9	1.6
3134	10/29/2002	6	100.2	97.9	2.2
3182	12/7/1988	6	111.1	113.4	-2.3
3182	3/22/1989	6	111.2	109.6	1.6
3182	7/26/1989	6	110.8	108.7	2.1
3182	10/25/1989	6	109.8	108.2	1.5
3182	4/18/1990	6	106.3	107.2	-0.9
3182	10/11/1990	6	104.2	106.2	-2.0
3182	4/24/1991	6	104.3	105.6	-1.3
3182	7/15/1991	6	104.1	105.6	-1.6
3182	10/16/1991	6	103.2	105.6	-2.4
3182	1/9/1992	6	102.4	105.6	-3.3
3182	6/23/1992	6	103.6	105.7	-2.1
3182	10/19/1992	6	101.5	105.6	-4.1
3182	1/21/1993	6	102.4	105.5	-3.1
3182	4/22/1993	6	105.7	105.6	0.1
3182	10/19/1993	6	104.4	106.0	-1.6
3182	2/1/1994	6	103.4	106.2	-2.8
3182	4/18/1994	6	103.1	106.0	-2.9
3182	10/26/1994	6	101.4	104.8	-3.4
3182	4/27/1995	6	107.9	103.7	4.2
3182	10/25/1995	6	106.2	105.5	0.7
3182	4/17/1996	6	106.4	105.8	0.6
3182	10/21/1996	6	105.1	106.6	-1.5
3182	1/13/1997	6	105.9	106.8	-0.9
3182	4/16/1997	6	108.5	106.1	2.4
3182	10/9/1997	6	106.2	105.1	1.2
3182	6/5/1998	6	111.7	107.0	4.7
3182	10/21/1998	6	109.7	108.9	0.8
3182	4/6/1999	6	108.7	107.8	0.9
3182	10/19/1999	6	105.4	104.4	0.9
3182	2/1/2000	6	103.9	102.9	1.0
3182	4/18/2000	6	107.6	103.1	4.5
3182	10/24/2000	6	105.0	103.6	1.3
3182	1/16/2001	6	104.1	104.2	-0.1
3182	4/24/2001	6	103.3	103.9	-0.6
3182	10/10/2001	6	101.9	102.8	-0.9
3182	10/28/2002	6	100.9	99.2	1.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3192	12/9/1988	6	103.1	105.2	-2.1
3192	3/22/1989	6	103.8	102.2	1.6
3192	6/30/1989	6	105.3	101.6	3.7
3192	10/26/1989	6	102.7	101.0	1.7
3192	10/22/1990	6	96.6	99.0	-2.4
3192	2/12/1991	6	95.7	98.6	-2.9
3192	5/2/1991	6	97.2	98.6	-1.4
3192	8/1/1991	6	96.7	98.6	-2.0
3192	11/7/1991	6	96.2	98.6	-2.4
3192	4/27/1992	6	96.6	98.7	-2.2
3192	8/6/1992	6	95.0	98.7	-3.7
3192	10/16/1992	6	94.5	98.6	-4.1
3192	7/29/1993	6	98.1	98.8	-0.8
3192	10/19/1993	6	97.2	99.0	-1.8
3192	2/1/1994	6	96.2	99.1	-2.8
3192	4/20/1994	6	96.5	98.7	-2.2
3192	1/16/1995	6	94.6	95.8	-1.2
3192	4/27/1995	6	98.9	95.7	3.2
3192	7/25/1995	6	99.8	96.6	3.2
3192	10/26/1995	6	97.7	97.5	0.2
3192	1/22/1996	6	96.3	97.4	-1.1
3192	4/16/1996	6	97.8	97.4	0.4
3192	7/16/1996	6	98.0	97.7	0.3
3192	10/23/1996	6	98.2	98.0	0.1
3192	1/7/1997	6	97.2	98.2	-1.0
3192	4/16/1997	6	100.4	97.4	3.0
3192	7/14/1997	6	99.1	96.8	2.3
3192	10/8/1997	6	97.9	96.3	1.5
3192	1/20/1998	6	96.8	96.5	0.3
3192	6/5/1998	6	101.7	98.3	3.4
3192	10/21/1998	6	100.5	100.1	0.4
3192	1/18/1999	6	98.2	100.4	-2.2
3192	4/5/1999	6	98.9	98.6	0.3
3192	7/26/1999	6	99.1	96.5	2.6
3192	10/19/1999	6	96.2	95.1	1.0
3192	1/10/2000	6	96.1	93.8	2.3
3192	4/17/2000	6	98.7	93.8	5.0
3192	7/5/2000	6	97.5	94.0	3.5
3192	10/23/2000	6	95.6	94.3	1.2
3192	1/22/2001	6	94.4	94.9	-0.5
3192	4/24/2001	6	93.7	94.5	-0.8
3192	7/23/2001	6	96.3	93.9	2.4
3192	1/14/2002	6	92.3	92.4	0.0
3192	4/15/2002	6	93.6	91.3	2.2
3192	7/15/2002	6	92.5	90.5	2.1
3192	10/28/2002	6	91.9	89.5	2.3

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3252	7/5/1989	6	118.2	117.6	0.6
3252	11/1/1989	6	117.3	116.9	0.4
3252	5/8/1990	6	116.4	115.7	0.7
3252	7/23/1990	6	115.7	115.2	0.5
3252	10/29/1990	6	117.4	114.6	2.8
3252	5/7/1991	6	115.1	114.1	1.0
3252	8/7/1991	6	113.9	114.0	-0.1
3252	11/6/1991	6	114.0	113.9	0.1
3252	1/24/1992	6	112.8	113.9	-1.1
3252	4/23/1992	6	114.5	113.8	0.7
3252	10/17/1992	6	111.8	113.6	-1.8
3252	4/21/1993	6	115.2	113.7	1.4
3252	10/18/1993	6	113.0	114.1	-1.1
3252	4/19/1994	6	112.4	113.7	-1.3
3252	10/28/1994	6	111.2	112.4	-1.2
3252	4/27/1995	6	117.6	112.5	5.1
3252	10/25/1995	6	115.9	114.6	1.3
3252	4/15/1996	6	117.0	115.5	1.5
3252	10/21/1996	6	115.7	116.4	-0.8
3252	4/16/1997	6	119.3	116.0	3.3
3252	10/9/1997	6	116.7	114.9	1.7
3252	4/22/1998	6	122.1	116.3	5.7
3252	10/21/1998	6	120.2	119.1	1.1
3252	1/25/1999	6	119.7	119.7	0.0
3252	4/6/1999	6	120.8	118.3	2.5
3252	10/19/1999	6	117.5	115.1	2.5
3252	4/17/2000	6	119.7	114.0	5.7
3252	10/23/2000	6	117.6	114.6	3.0
3252	4/23/2001	6	117.0	114.4	2.6
3252	4/16/2002	6	115.7	111.5	4.3
3252	10/28/2002	6	114.0	109.6	4.3
3291	10/25/1989	6	113.2	113.7	-0.5
3291	5/17/1990	6	112.0	112.4	-0.4
3291	7/27/1990	6	111.3	112.0	-0.7
3291	10/30/1990	6	110.3	111.5	-1.3
3291	4/24/1991	6	111.8	111.1	0.7
3291	7/11/1991	6	109.8	111.1	-1.3
3291	10/15/1991	6	109.5	111.0	-1.5
3291	1/7/1992	6	109.2	111.1	-1.9
3291	6/22/1992	6	109.3	111.4	-2.1
3291	10/19/1992	6	107.9	111.3	-3.4
3291	1/22/1993	6	107.9	111.2	-3.3
3291	6/16/1993	6	109.9	111.4	-1.5
3291	10/18/1993	6	109.2	111.6	-2.4
3291	4/18/1994	6	108.7	112.2	-3.5
3291	10/26/1994	6	107.2	111.1	-3.9

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3291	4/25/1995	6	110.0	109.7	0.3
3291	4/15/1996	6	111.3	111.7	-0.4
3291	7/16/1996	6	111.4	112.1	-0.7
3291	10/22/1996	6	111.7	112.5	-0.8
3291	4/17/1997	6	113.2	112.1	1.0
3291	10/9/1997	6	112.4	111.1	1.3
3291	4/22/1998	6	114.6	112.2	2.4
3291	10/21/1998	6	116.1	114.5	1.5
3291	4/6/1999	6	115.4	113.7	1.7
3291	10/20/1999	6	113.4	110.5	2.9
3291	4/18/2000	6	113.5	109.2	4.3
3291	10/24/2000	6	113.2	109.7	3.4
3291	4/24/2001	6	112.1	110.3	1.8
3291	10/10/2001	6	110.7	109.3	1.4
3291	4/15/2002	6	110.6	107.7	2.9
3291	10/29/2002	6	107.4	106.0	1.4
3313	4/18/1990	6	116.9	117.5	-0.6
3313	10/8/1990	6	115.5	116.5	-1.0
3313	4/24/1991	6	119.7	115.8	3.8
3313	10/15/1991	6	118.3	115.7	2.5
3313	1/10/1992	6	116.4	115.7	0.7
3313	4/14/1992	6	117.6	115.8	1.8
3313	8/6/1992	6	115.9	115.7	0.2
3313	10/19/1992	6	114.9	115.7	-0.8
3313	1/18/1993	6	115.2	115.6	-0.5
3313	6/28/1993	6	117.4	115.8	1.6
3313	10/19/1993	6	116.0	116.1	0.0
3313	4/18/1994	6	115.5	116.1	-0.6
3313	10/26/1994	6	114.1	114.9	-0.9
3313	4/27/1995	6	120.5	114.3	6.2
3313	10/25/1995	6	119.4	116.2	3.2
3313	4/15/1996	6	120.2	116.8	3.3
3313	10/22/1996	6	119.1	117.7	1.4
3313	1/16/1997	6	119.8	118.0	1.8
3313	4/16/1997	6	122.9	117.4	5.5
3313	10/9/1997	6	120.8	116.3	4.5
3313	4/22/1998	6	125.6	117.6	8.1
3313	10/21/1998	6	123.8	120.2	3.7
3313	4/6/1999	6	123.8	119.3	4.5
3313	10/19/1999	6	120.5	116.2	4.4
3313	4/18/2000	6	122.6	115.0	7.6
3313	10/24/2000	6	120.5	115.5	5.0
3313	4/23/2001	6	120.0	115.7	4.3
3313	10/10/2001	6	118.2	114.6	3.6
3313	4/16/2002	6	119.0	112.9	6.0
3313	10/28/2002	6	117.1	111.2	5.9

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3322	11/6/1990	6	99.7	100.4	-0.7
3322	4/24/1991	6	99.9	100.1	-0.2
3322	7/10/1991	6	99.3	100.0	-0.7
3322	1/8/1992	6	97.7	100.0	-2.3
3322	4/15/1992	6	99.0	99.9	-0.9
3322	7/9/1992	6	98.3	99.8	-1.5
3322	10/17/1992	6	97.3	99.7	-2.4
3322	1/20/1993	6	96.9	99.7	-2.7
3322	4/21/1993	6	100.9	99.9	1.0
3322	10/18/1993	6	99.1	100.2	-1.1
3322	4/20/1994	6	98.0	99.6	-1.5
3322	10/27/1994	6	96.0	98.2	-2.2
3322	1/16/1995	6	96.6	97.4	-0.8
3322	4/26/1995	6	101.0	98.1	2.9
3322	7/25/1995	6	102.0	99.1	2.8
3322	10/25/1995	6	100.1	100.2	-0.1
3322	4/17/1996	6	101.1	100.7	0.4
3322	10/22/1996	6	98.9	101.5	-2.6
3322	1/17/1997	6	100.0	101.6	-1.6
3322	4/16/1997	6	103.3	100.9	2.4
3322	10/9/1997	6	99.8	99.8	-0.1
3322	6/6/1998	6	106.1	102.0	4.1
3322	10/21/1998	6	104.0	104.0	0.0
3322	4/6/1999	6	104.3	102.8	1.5
3322	10/19/1999	6	100.1	99.3	0.8
3322	2/3/2000	6	98.9	97.8	1.1
3322	4/17/2000	6	102.8	98.1	4.7
3322	7/5/2000	6	102.5	98.3	4.2
3322	10/23/2000	6	100.3	98.7	1.6
3322	4/23/2001	6	99.0	98.5	0.4
3322	4/16/2002	6	98.2	95.1	3.1
3322	10/28/2002	6	95.5	93.3	2.3
108	5/11/1983	8	140.1	138.2	1.9
108	7/26/1983	8	134.1	139.1	-5.0
108	11/20/1984	8	126.9	133.0	-6.1
108	8/28/1985	8	124.9	129.9	-4.9
108	4/24/1986	8	131.2	128.2	3.0
108	9/23/1986	8	127.8	128.0	-0.2
108	12/10/1986	8	126.6	127.9	-1.3
108	6/17/1987	8	126.6	127.5	-0.9
108	9/1/1987	8	125.7	127.2	-1.5
108	11/12/1987	8	125.8	127.0	-1.2
108	7/12/1988	8	125.5	127.1	-1.6
108	12/7/1988	8	124.9	126.3	-1.5
108	3/23/1989	8	124.9	123.8	1.1
108	10/26/1989	8	123.7	122.2	1.5

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
108	4/19/1990	8	123.3	121.2	2.1
108	10/10/1990	8	122.0	120.3	1.6
108	4/25/1991	8	121.9	119.9	2.0
108	8/6/1991	8	120.5	119.9	0.6
108	1/9/1992	8	119.7	119.9	-0.2
108	4/14/1992	8	121.1	120.1	1.1
108	6/29/1992	8	120.2	120.0	0.2
108	10/19/1992	8	119.0	120.0	-1.1
108	1/13/1993	8	118.7	120.0	-1.3
108	6/1/1993	8	120.9	120.2	0.7
108	10/18/1993	8	119.4	120.5	-1.1
108	4/20/1994	8	119.1	120.6	-1.5
108	10/26/1994	8	118.4	119.6	-1.2
108	4/25/1995	8	124.1	119.3	4.8
108	10/26/1995	8	121.9	120.8	1.0
108	4/15/1996	8	123.0	121.5	1.5
108	10/22/1996	8	121.6	122.3	-0.6
108	4/15/1997	8	124.4	121.9	2.5
108	10/6/1997	8	122.8	120.9	1.8
108	4/23/1998	8	126.9	121.8	5.1
108	10/23/1998	8	124.6	124.1	0.5
108	4/6/1999	8	125.6	123.3	2.3
108	10/19/1999	8	123.2	120.2	3.0
108	4/19/2000	8	125.1	119.2	5.9
108	10/25/2000	8	123.5	119.8	3.8
108	4/23/2001	8	123.6	119.8	3.7
108	10/9/2001	8	122.2	119.0	3.2
108	4/17/2002	8	122.7	117.6	5.1
108	10/28/2002	8	121.9	116.0	5.9
205	6/8/1984	8	171.4	159.3	12.1
205	10/26/1984	8	168.7	155.8	12.9
205	8/28/1985	8	165.5	151.7	13.8
205	7/2/1986	8	169.6	150.1	19.5
205	9/24/1986	8	169.1	150.0	19.0
205	12/11/1986	8	166.0	150.0	16.0
205	6/17/1987	8	165.7	149.5	16.2
205	9/1/1987	8	164.1	149.2	14.8
205	11/19/1987	8	166.1	148.9	17.1
205	2/16/1988	8	164.4	149.0	15.3
205	7/12/1988	8	164.4	148.2	16.2
205	10/8/2001	8	160.9	142.1	18.8
205	1/29/2002	8	160.9	141.3	19.6
205	4/19/2002	8	161.5	140.6	20.9
205	10/28/2002	8	159.9	139.0	20.8
1171	10/14/1983	8	52.0	54.4	-2.5
1171	11/20/1984	8	51.0	48.1	2.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1171	6/20/1985	8	45.0	45.0	0.0
1171	4/24/1986	8	49.1	42.0	7.1
1171	9/23/1986	8	44.9	41.5	3.4
1171	6/17/1987	8	42.8	40.7	2.1
1171	9/3/1987	8	40.3	40.5	-0.3
1171	2/16/1988	8	43.9	39.6	4.3
1171	7/12/1988	8	39.7	37.6	2.1
1171	12/12/1988	8	40.9	35.6	5.3
1171	8/13/1991	8	36.7	33.5	3.2
1171	11/12/1991	8	37.1	33.5	3.6
1171	1/28/1992	8	39.0	33.4	5.5
1171	4/29/1992	8	38.1	33.2	4.9
1171	9/28/1992	8	35.6	32.8	2.7
1171	4/21/1993	8	38.9	31.8	7.0
1171	7/29/1993	8	29.0	31.1	-2.1
1171	10/20/1993	8	28.8	30.5	-1.8
1171	4/18/1994	8	28.9	28.3	0.6
1171	8/17/1994	8	24.8	26.5	-1.7
1171	10/27/1994	8	28.6	25.4	3.2
1171	4/25/1995	8	31.4	25.3	6.2
1171	7/5/1995	8	30.1	25.8	4.3
1171	10/25/1995	8	28.5	26.6	1.8
1171	1/9/1996	8	36.5	26.9	9.6
1171	4/16/1996	8	31.4	26.4	4.9
1171	7/2/1996	8	26.9	26.4	0.4
1171	10/22/1996	8	30.2	26.4	3.8
1171	4/16/1997	8	28.9	26.2	2.7
1171	7/25/1997	8	28.0	26.0	2.0
1171	10/7/1997	8	27.5	25.8	1.6
1171	1/19/1998	8	31.9	25.9	5.9
1171	4/29/1998	8	32.4	26.6	5.9
1171	7/17/1998	8	28.1	27.0	1.1
1171	10/20/1998	8	33.0	27.5	5.4
1171	1/4/1999	8	30.6	27.8	2.8
1171	4/26/1999	8	30.6	25.2	5.5
1171	7/23/1999	8	26.9	23.2	3.7
1171	12/7/1999	8	26.2	20.1	6.1
1171	6/16/2000	8	24.9	21.6	3.3
1171	12/11/2000	8	31.7	23.4	8.3
1171	4/3/2001	8	28.2	21.6	6.7
1171	6/20/2002	8	25.9	13.5	12.4
1171	12/3/2002	8	28.1	11.4	16.7
1394	9/23/1986	8	87.2	91.2	-4.0
1394	12/11/1986	8	86.0	91.0	-5.1
1394	9/3/1987	8	83.2	90.0	-6.8
1394	11/17/1987	8	84.1	89.7	-5.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1394	2/16/1988	8	83.9	89.3	-5.4
1394	5/3/1988	8	83.8	88.8	-5.0
1394	7/15/1988	8	83.5	88.2	-4.7
1394	12/7/1988	8	82.1	87.0	-5.0
1394	10/27/1989	8	82.8	85.0	-2.2
1394	4/19/1990	8	82.7	84.3	-1.6
1394	10/8/1990	8	81.6	83.5	-1.9
1394	4/24/1991	8	81.0	83.2	-2.2
1394	8/7/1991	8	81.1	83.3	-2.2
1394	11/6/1991	8	80.6	83.3	-2.7
1394	1/23/1992	8	79.2	83.3	-4.1
1394	4/14/1992	8	80.5	83.2	-2.8
1394	10/20/1992	8	80.0	83.1	-3.1
1394	2/10/1993	8	80.7	83.1	-2.5
1394	7/29/1993	8	82.2	83.4	-1.1
1394	10/20/1993	8	81.2	83.5	-2.3
1394	4/19/1994	8	80.4	82.6	-2.2
1394	7/19/1994	8	79.6	81.9	-2.3
1394	10/24/1994	8	78.7	81.2	-2.5
1394	4/24/1995	8	82.6	81.2	1.4
1394	7/21/1995	8	83.4	82.0	1.4
1394	10/25/1995	8	81.4	83.0	-1.5
1394	4/16/1996	8	82.5	82.5	-0.1
1394	7/16/1996	8	81.1	82.7	-1.6
1394	10/22/1996	8	79.8	82.9	-3.2
1394	1/9/1997	8	81.3	82.9	-1.7
1394	4/15/1997	8	82.6	82.1	0.5
1394	10/7/1997	8	80.0	81.1	-1.2
1394	1/15/1998	8	80.4	81.2	-0.8
1394	4/22/1998	8	83.9	82.5	1.4
1394	10/21/1998	8	81.9	84.7	-2.8
1394	1/19/1999	8	80.9	84.5	-3.5
1394	4/6/1999	8	81.8	82.3	-0.5
1394	7/27/1999	8	80.2	80.2	0.0
1394	10/20/1999	8	78.5	78.7	-0.2
1394	1/11/2000	8	78.4	77.5	0.9
1394	4/18/2000	8	80.2	77.9	2.3
1394	10/24/2000	8	79.2	78.5	0.6
1394	1/22/2001	8	78.8	78.8	0.0
1394	4/24/2001	8	78.8	78.1	0.6
1394	10/9/2001	8	76.6	76.7	-0.1
1394	4/15/2002	8	78.0	73.2	4.7
1394	10/22/2002	8	75.8	71.4	4.4
1402	4/24/1986	8	86.7	88.2	-1.5
1402	9/23/1986	8	85.1	87.9	-2.8
1402	12/11/1986	8	84.6	87.8	-3.2

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1402	6/17/1987	8	83.5	86.9	-3.5
1402	9/1/1987	8	84.0	86.7	-2.7
1402	11/16/1987	8	82.0	86.5	-4.4
1402	2/16/1988	8	81.9	86.0	-4.0
1402	7/12/1988	8	81.4	84.8	-3.4
1402	12/7/1988	8	79.9	83.5	-3.6
1402	3/23/1989	8	80.6	82.7	-2.1
1402	10/25/1989	8	79.4	81.7	-2.3
1402	4/19/1990	8	80.0	81.0	-0.9
1402	10/8/1990	8	79.2	80.2	-1.0
1402	4/24/1991	8	78.8	79.9	-1.1
1402	7/26/1991	8	78.4	80.0	-1.6
1402	11/4/1991	8	77.7	80.0	-2.3
1402	4/14/1992	8	79.1	79.9	-0.8
1402	7/20/1992	8	78.4	79.9	-1.5
1402	10/19/1992	8	77.3	79.8	-2.5
1402	2/3/1993	8	77.6	79.8	-2.2
1402	7/29/1993	8	79.3	80.0	-0.7
1402	1/9/1997	8	78.1	79.4	-1.3
1402	4/15/1997	8	80.2	78.6	1.6
1402	10/7/1997	8	76.4	77.6	-1.2
1402	4/22/1998	8	80.6	79.2	1.4
1402	10/21/1998	8	78.8	81.3	-2.5
1402	1/19/1999	8	77.8	81.1	-3.3
1402	4/6/1999	8	78.6	79.0	-0.4
1402	8/5/1999	8	76.7	76.6	0.1
1402	10/21/1999	8	75.2	75.3	-0.1
1402	1/11/2000	8	75.1	74.1	0.9
1402	4/18/2000	8	76.7	74.5	2.2
1402	10/24/2000	8	76.0	75.2	0.8
1402	1/22/2001	8	75.7	75.4	0.3
1402	4/24/2001	8	75.4	74.7	0.7
1402	10/9/2001	8	72.9	73.2	-0.3
1402	1/15/2002	8	73.5	71.2	2.3
1402	4/15/2002	8	74.5	69.3	5.2
1402	7/11/2002	8	74.0	68.4	5.6
1402	10/21/2002	8	71.9	67.4	4.4
1409	2/16/1988	8	41.6	41.3	0.3
1409	5/3/1988	8	40.3	40.5	-0.2
1409	7/21/1988	8	38.4	39.7	-1.4
1409	12/7/1988	8	39.0	38.3	0.6
1409	10/27/1989	8	38.1	37.3	0.8
1409	4/19/1990	8	38.2	36.9	1.3
1409	10/9/1990	8	41.0	36.3	4.7
1409	7/8/1991	8	35.5	36.1	-0.6
1409	11/7/1991	8	34.5	36.1	-1.7

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1409	1/22/1992	8	35.9	36.1	-0.2
1409	4/14/1992	8	36.6	36.0	0.6
1409	10/19/1992	8	33.9	35.7	-1.9
1409	4/23/1993	8	36.7	35.7	1.0
1409	7/30/1993	8	30.7	35.6	-4.9
1409	10/18/1993	8	30.3	35.5	-5.1
1409	4/18/1994	8	30.3	34.2	-3.9
1409	10/26/1994	8	27.6	32.5	-4.9
1409	7/18/1995	8	31.4	33.3	-1.9
1409	1/11/1996	8	33.7	34.1	-0.3
1409	4/15/1996	8	32.5	33.7	-1.2
1409	7/15/1996	8	28.9	33.6	-4.8
1409	10/21/1996	8	29.8	33.6	-3.8
1409	4/14/1997	8	31.0	32.9	-1.9
1409	10/6/1997	8	27.5	32.3	-4.8
1409	1/19/1998	8	30.2	31.6	-1.4
1409	4/20/1998	8	33.0	31.6	1.3
1409	10/23/1998	8	29.7	32.5	-2.8
1409	1/6/1999	8	26.0	32.3	-6.3
1409	4/19/1999	8	27.6	28.8	-1.2
1409	7/26/1999	8	22.5	26.9	-4.4
1409	10/19/1999	8	21.2	25.3	-4.0
1409	1/10/2000	8	23.3	24.1	-0.8
1409	4/18/2000	8	25.1	24.9	0.2
1409	7/6/2000	8	21.6	25.3	-3.7
1409	10/25/2000	8	28.8	25.8	3.0
1409	1/23/2001	8	25.2	25.5	-0.3
1409	4/23/2001	8	21.7	24.2	-2.5
1409	7/23/2001	8	20.8	22.9	-2.1
1409	10/9/2001	8	23.6	21.8	1.8
1409	1/14/2002	8	22.9	19.1	3.8
1409	4/15/2002	8	29.4	16.8	12.6
1409	7/12/2002	8	12.6	15.7	-3.2
1409	10/21/2002	8	13.9	14.6	-0.7
1471	8/7/1991	8	66.8	68.3	-1.5
1471	11/6/1991	8	66.6	68.3	-1.8
1471	1/21/1992	8	66.4	68.3	-2.0
1471	4/14/1992	8	67.9	68.3	-0.4
1471	10/19/1992	8	65.5	68.1	-2.6
1471	4/22/1993	8	68.0	68.2	-0.1
1471	7/29/1993	8	67.0	68.2	-1.2
1471	10/20/1993	8	65.8	68.3	-2.5
1471	4/18/1994	8	66.1	67.2	-1.2
1471	8/17/1994	8	64.0	66.2	-2.2
1471	4/24/1995	8	67.3	66.1	1.2
1471	10/24/1995	8	66.2	67.8	-1.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1471	4/16/1996	8	68.3	66.3	1.9
1471	10/22/1996	8	64.9	66.5	-1.7
1471	1/9/1997	8	64.5	66.4	-1.9
1471	4/16/1997	8	64.7	65.6	-0.8
1471	10/7/1997	8	62.2	64.7	-2.5
1471	1/14/1998	8	64.7	64.9	-0.2
1471	4/21/1998	8	68.1	66.2	1.9
1471	10/21/1998	8	62.1	68.0	-5.9
1471	1/19/1999	8	61.2	67.5	-6.4
1471	4/6/1999	8	61.2	65.2	-3.9
1471	8/5/1999	8	57.8	62.8	-5.0
1471	10/20/1999	8	55.8	61.4	-5.6
1471	1/11/2000	8	58.7	60.4	-1.7
1471	7/10/2000	8	60.3	61.6	-1.2
1471	10/24/2000	8	59.1	62.0	-2.9
1471	1/22/2001	8	58.7	61.9	-3.1
1471	4/24/2001	8	59.2	61.0	-1.8
1471	7/22/2001	8	56.5	60.1	-3.6
1471	10/18/2001	8	53.7	59.2	-5.4
1471	1/15/2002	8	55.3	56.0	-0.7
1471	4/15/2002	8	58.8	53.0	5.7
1471	7/25/2002	8	55.1	52.0	3.1
1471	10/21/2002	8	52.7	51.1	1.6
1474	4/24/1991	8	81.6	85.3	-3.7
1474	7/8/1991	8	81.8	85.4	-3.6
1474	10/31/1991	8	81.8	85.4	-3.6
1474	1/22/1992	8	80.9	85.4	-4.5
1474	4/14/1992	8	80.6	85.4	-4.8
1474	10/19/1992	8	80.7	85.3	-4.6
1474	7/29/1993	8	83.2	85.6	-2.4
1474	10/18/1993	8	82.3	85.7	-3.4
1474	4/19/1994	8	81.1	84.9	-3.8
1474	7/19/1994	8	80.6	84.3	-3.6
1474	10/24/1994	8	79.8	83.6	-3.8
1474	4/25/1995	8	84.3	83.5	0.8
1474	8/11/1995	8	83.9	84.5	-0.6
1474	10/24/1995	8	82.5	85.2	-2.7
1474	4/16/1996	8	83.6	84.9	-1.4
1474	8/1/1996	8	82.5	85.1	-2.7
1474	10/22/1996	8	81.1	85.3	-4.2
1474	4/15/1997	8	83.7	84.4	-0.7
1474	10/7/1997	8	81.2	83.5	-2.3
1474	1/14/1998	8	81.6	83.5	-1.9
1474	4/21/1998	8	85.3	84.8	0.5
1474	10/21/1998	8	82.7	86.8	-4.1
1474	1/19/1999	8	81.7	86.5	-4.8

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
1474	4/6/1999	8	82.7	84.4	-1.7
1474	10/20/1999	8	79.8	80.8	-1.1
1474	1/11/2000	8	79.3	79.7	-0.4
1474	4/18/2000	8	81.5	80.1	1.4
1474	10/24/2000	8	80.0	80.7	-0.7
1474	1/22/2001	8	79.7	80.9	-1.3
1474	4/24/2001	8	79.6	80.3	-0.7
1474	10/8/2001	8	77.9	79.0	-1.1
1474	1/15/2002	8	78.4	77.4	1.0
1474	4/15/2002	8	79.4	75.8	3.6
1474	10/21/2002	8	77.3	74.1	3.2
1590	6/1/1995	8	34.2	31.8	2.5
1590	12/4/1995	8	32.6	32.9	-0.4
1590	6/8/1998	8	33.0	30.5	2.5
1590	11/10/1998	8	32.5	31.2	1.3
1590	10/18/1999	8	21.5	23.7	-2.2
1590	1/27/2000	8	26.6	22.8	3.8
1590	4/19/2000	8	11.0	23.3	-12.3
1590	10/23/2000	8	28.8	24.3	4.5
1590	2/8/2001	8	24.2	23.7	0.5
1590	4/23/2001	8	22.0	22.6	-0.6
1590	10/8/2001	8	23.2	20.1	3.1
1590	4/16/2002	8	30.5	15.1	15.3
1590	10/21/2002	8	14.6	12.9	1.7
3136	11/12/1987	8	108.1	113.5	-5.4
3136	7/12/1988	8	106.6	113.5	-6.9
3136	1/5/1989	8	105.2	112.1	-6.9
3136	10/26/1989	8	103.8	106.9	-3.1
3136	1/26/1990	8	103.5	106.3	-2.8
3136	4/18/1990	8	102.3	105.8	-3.6
3136	7/18/1990	8	101.3	105.3	-4.0
3136	10/9/1990	8	100.2	104.9	-4.7
3136	4/24/1991	8	99.5	104.4	-4.9
3136	8/7/1991	8	99.0	104.4	-5.4
3136	10/30/1991	8	99.0	104.4	-5.4
3136	7/20/1992	8	98.3	104.6	-6.3
3136	10/19/1992	8	97.4	104.5	-7.2
3136	1/28/1993	8	97.8	104.5	-6.7
3136	7/29/1993	8	98.7	104.7	-6.0
3136	10/18/1993	8	98.8	104.8	-6.1
3136	2/1/1994	8	98.0	105.2	-7.1
3136	10/22/1998	8	103.2	107.3	-4.2
3136	4/6/1999	8	103.4	106.1	-2.7
3136	7/26/1999	8	102.4	104.2	-1.8
3136	10/20/1999	8	101.7	102.8	-1.1
3136	1/10/2000	8	100.6	101.6	-1.0

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3136	7/5/2000	8	100.0	101.7	-1.7
3136	10/24/2000	8	101.2	102.0	-0.8
3136	1/22/2001	8	100.6	102.7	-2.2
3136	4/24/2001	8	100.2	102.4	-2.2
3136	7/23/2001	8	101.6	101.8	-0.3
3136	10/10/2001	8	98.5	101.3	-2.8
3136	1/14/2002	8	98.5	100.5	-2.0
3136	4/15/2002	8	98.4	99.5	-1.1
3136	7/15/2002	8	98.8	98.7	0.1
3136	10/29/2002	8	97.3	97.8	-0.5
3184	12/7/1988	8	113.6	112.6	0.9
3184	3/22/1989	8	113.0	109.1	3.9
3184	7/26/1989	8	111.9	108.2	3.6
3184	10/25/1989	8	111.4	107.7	3.7
3184	4/18/1990	8	109.9	106.7	3.2
3184	10/11/1990	8	108.1	105.7	2.4
3184	4/24/1991	8	107.0	105.2	1.9
3184	7/15/1991	8	107.0	105.1	1.8
3184	10/16/1991	8	106.4	105.1	1.3
3184	6/23/1992	8	106.3	105.2	1.0
3184	10/19/1992	8	105.4	105.1	0.3
3184	1/21/1993	8	105.5	105.1	0.5
3184	4/22/1993	8	106.3	105.1	1.1
3184	10/19/1993	8	106.3	105.5	0.8
3184	2/1/1994	8	105.9	105.7	0.2
3184	4/18/1994	8	100.7	105.5	-4.8
3184	10/26/1994	8	104.8	104.2	0.5
3184	4/27/1995	8	106.7	103.2	3.5
3184	10/25/1995	8	108.5	105.0	3.5
3184	4/17/1996	8	107.8	105.3	2.5
3184	10/21/1996	8	107.5	106.1	1.4
3184	1/13/1997	8	108.2	106.2	1.9
3184	4/16/1997	8	108.8	105.6	3.2
3184	10/9/1997	8	108.5	104.5	3.9
3184	6/5/1998	8	110.8	106.5	4.4
3184	10/21/1998	8	111.6	108.4	3.2
3184	4/6/1999	8	111.0	107.2	3.8
3184	10/19/1999	8	109.3	103.9	5.4
3184	2/1/2000	8	108.8	102.3	6.4
3184	4/18/2000	8	109.2	102.5	6.7
3184	10/24/2000	8	108.8	103.1	5.7
3184	1/16/2001	8	108.4	103.6	4.8
3184	4/24/2001	8	107.9	103.3	4.6
3184	10/10/2001	8	106.7	102.2	4.5
3184	10/28/2002	8	105.6	98.5	7.0
3254	7/5/1989	8	115.3	117.4	-2.1

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3254	11/1/1989	8	114.3	116.7	-2.3
3254	5/8/1990	8	113.4	115.5	-2.1
3254	7/23/1990	8	112.7	115.0	-2.3
3254	10/29/1990	8	111.7	114.4	-2.7
3254	5/7/1991	8	111.2	113.9	-2.7
3254	8/7/1991	8	110.6	113.8	-3.1
3254	11/5/1991	8	110.4	113.7	-3.4
3254	1/24/1992	8	109.8	113.7	-3.9
3254	4/29/1992	8	110.4	113.6	-3.2
3254	10/17/1992	8	108.9	113.4	-4.6
3254	4/21/1993	8	110.3	113.5	-3.2
3254	10/18/1993	8	109.7	113.9	-4.2
3254	4/19/1994	8	109.1	113.5	-4.3
3254	10/28/1994	8	109.2	112.2	-3.0
3254	4/28/1995	8	110.9	112.3	-1.5
3254	10/25/1995	8	111.6	114.3	-2.8
3254	4/15/1996	8	112.0	115.2	-3.3
3254	10/21/1996	8	111.7	116.2	-4.5
3254	4/16/1997	8	113.9	115.8	-1.9
3254	10/9/1997	8	112.9	114.7	-1.8
3254	4/22/1998	8	115.4	116.1	-0.7
3254	10/21/1998	8	116.1	118.9	-2.9
3254	1/25/1999	8	115.8	119.4	-3.7
3254	4/6/1999	8	116.4	118.1	-1.7
3254	10/19/1999	8	114.3	114.8	-0.5
3254	4/17/2000	8	114.8	113.8	1.0
3254	10/23/2000	8	114.1	114.4	-0.3
3254	4/23/2001	8	113.3	114.2	-0.9
3254	4/16/2002	8	112.1	111.2	0.9
3254	10/28/2002	8	110.6	109.4	1.2
3259	6/30/1989	8	106.0	105.7	0.3
3259	11/17/1989	8	104.9	104.9	0.0
3259	4/18/1990	8	103.4	104.0	-0.6
3259	10/30/1990	8	101.4	103.0	-1.6
3259	4/24/1991	8	100.5	102.6	-2.1
3259	7/29/1991	8	100.0	102.6	-2.6
3259	10/24/1991	8	99.5	102.6	-3.0
3259	4/20/1992	8	99.6	102.8	-3.2
3259	10/19/1992	8	98.4	102.7	-4.3
3259	7/29/1993	8	99.7	102.8	-3.2
3259	10/19/1993	8	99.6	103.0	-3.4
3259	2/1/1994	8	99.1	103.3	-4.2
3259	4/20/1994	8	98.8	103.1	-4.3
3259	10/26/1994	8	97.4	101.9	-4.5
3259	4/27/1995	8	99.5	100.6	-1.1
3259	8/4/1995	8	100.7	101.6	-0.9

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3259	10/30/1995	8	100.5	102.4	-1.9
3259	1/22/1996	8	100.3	102.3	-2.1
3259	4/15/1996	8	100.8	102.4	-1.6
3259	7/16/1996	8	102.2	102.8	-0.6
3259	10/21/1996	8	100.3	103.1	-2.8
3259	1/17/1997	8	100.8	103.2	-2.5
3259	4/16/1997	8	101.9	102.6	-0.8
3259	10/9/1997	8	101.7	101.6	0.1
3259	4/21/1998	8	103.1	102.9	0.2
3259	10/21/1998	8	107.4	105.3	2.1
3259	4/6/1999	8	104.4	104.1	0.4
3259	7/26/1999	8	103.5	102.1	1.4
3259	10/19/1999	8	102.7	100.7	2.0
3259	2/3/2000	8	102.2	99.1	3.1
3259	4/18/2000	8	102.6	99.3	3.2
3259	7/6/2000	8	102.9	99.5	3.4
3259	10/24/2000	8	102.3	99.9	2.4
3259	1/22/2001	8	101.7	100.6	1.2
3259	4/24/2001	8	101.2	100.2	1.0
3259	7/23/2001	8	101.8	99.6	2.2
3259	10/10/2001	8	99.5	99.1	0.4
3259	1/23/2002	8	99.3	98.0	1.3
3259	4/15/2002	8	99.4	97.2	2.2
3259	7/15/2002	8	98.9	96.4	2.5
3259	10/28/2002	8	98.0	95.5	2.6
3302	11/30/1989	8	78.5	83.3	-4.8
3302	4/18/1990	8	79.4	82.6	-3.2
3302	10/8/1990	8	77.8	81.7	-3.9
3302	4/24/1991	8	77.2	81.3	-4.1
3302	12/17/1991	8	75.9	81.4	-5.5
3302	7/24/1992	8	76.1	81.1	-5.0
3302	2/5/1993	8	75.6	81.0	-5.4
3302	6/28/1993	8	77.3	81.2	-3.9
3302	10/18/1993	8	76.1	81.4	-5.3
3302	4/20/1994	8	75.4	80.3	-4.9
3302	10/28/1994	8	73.3	78.7	-5.4
3302	4/25/1995	8	76.5	79.2	-2.7
3302	10/8/1997	8	74.4	80.2	-5.8
3302	4/21/1998	8	78.1	82.0	-3.9
3302	10/20/1998	8	77.8	84.5	-6.7
3302	4/5/1999	8	78.6	83.3	-4.7
3302	10/19/1999	8	75.0	79.5	-4.5
3302	4/17/2000	8	75.6	78.3	-2.7
3302	10/23/2000	8	75.4	78.9	-3.6
3302	4/23/2001	8	75.6	78.6	-3.1
3302	1/24/2002	8	73.3	75.0	-1.6

TABLE H1-A: REGIONAL GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Measurement Date	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
3302	4/15/2002	8	73.3	73.8	-0.5
3302	10/28/2002	8	70.6	71.9	-1.2
3308	11/30/1989	8	51.8	54.6	-2.8
3308	4/20/1990	8	52.8	54.0	-1.2
3308	10/9/1990	8	50.2	53.3	-3.1
3308	2/16/1991	8	51.1	53.0	-2.0
3308	7/8/1991	8	49.8	53.1	-3.3
3308	12/16/1991	8	49.3	53.1	-3.8
3308	4/15/1992	8	50.5	52.9	-2.4
3308	10/20/1992	8	48.0	52.5	-4.5
3308	4/23/1993	8	50.5	52.3	-1.8
3308	10/19/1993	8	48.4	52.2	-3.8
3308	4/26/1994	8	46.0	50.7	-4.8
3308	10/24/1994	8	42.8	48.7	-5.9
3308	4/24/1995	8	47.3	49.2	-1.8
3308	7/5/1995	8	48.0	50.0	-2.0
3308	10/23/1995	8	45.4	51.1	-5.8
3308	4/15/1996	8	49.3	50.1	-0.8
3308	4/14/1997	8	42.0	49.5	-7.5
3308	10/6/1997	8	37.7	48.9	-11.2
3308	1/15/1998	8	46.7	49.3	-2.5
3308	4/20/1998	8	51.3	50.8	0.5
3308	10/21/1998	8	42.2	53.3	-11.1
3308	4/6/1999	8	46.6	52.0	-5.4
3308	10/18/1999	8	38.2	47.8	-9.6
3308	4/17/2000	8	44.8	47.3	-2.5
3308	10/23/2000	8	45.7	48.2	-2.4
3308	4/24/2001	8	43.3	46.6	-3.3
3308	10/8/2001	8	34.5	44.2	-9.7
3308	4/16/2002	8	45.2	40.8	4.4
3308	10/21/2002	8	33.3	38.8	-5.5
3599	6/29/2000	8	52.1	56.1	-4.0
3599	10/23/2000	8	54.6	56.5	-1.9
3599	5/29/2001	8	54.7	54.7	0.0
3599	10/9/2001	8	50.1	53.0	-2.9
3599	1/4/2002	8	49.3	51.7	-2.4
3599	4/16/2002	8	52.3	49.1	3.1
3599	10/21/2002	8	52.6	47.2	5.5

TABLE H2-1: SUMMARY OF MODEL CALIBRATION STATISTICS
ZONE 1 GROUNDWATER FLOW MODEL
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Number of Wells	81
Total Number of Data Points	2568
Residual Mean (feet)	-0.50
Residual Standard Deviation (feet)	3.94
Sum of Squares	40421
Absolute Residual Mean (feet)	3.07
Min. Residual (feet)	-12.25
Max. Residual (feet)	20.89
Range	160.33
RSD/Range	0.025

Note: Monitoring Well IDs, Data, and Residuals are provided in Table H-A

TABLE H2-2: SUMMARY OF EXTRACTION AND RECHARGE WELL RATES
ZONE 1 REMEDIAL ALTERNATIVES
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

		Flow Rate (gpm)		
Name	Model Layer	Existing	Alternative Z1-2	Alternative Z1-3
4150-D, et al	B	-104	0	0
4001-D	D	-100	0	0
4017-D	D/E	-150	0	0
4035-D	B/C/D	-130	-200	-200
4205-D	B/C/D	-10	0	0
4210-D	D/E	-160	0	0
4220-D	D/E	-100	0	-192
4300-AR	B	-120	0	0
4301-AR	B	-40	0	0
4302-AR	D	-8	-23	-23
4320-D	E	-150	0	-150
4325-AR	B/C	-187	-187	-187
4330-AR	D	-290	-290	-290
4335-AR	D	-90	-90	-90
4340-AR	B	-2	0	0
4345-AR	B	-330	0	0
4350-AR	C/D	-15	0	0
4355-AR	B	-160	0	0
4360-AR	B	-142	0	0
4365-AR	B/C/D	-15	0	0
4370-AR	B	-270	0	0
4375-AR	B/C	-163	0	0
4380-AR	D	-40	-40	-40
4580-AR	D/E	0	-200	-200
4585-AR	E	-297	-297	-297
4620-AR	E	-283	-280	-280
5020-I	B/C/D	100	-200	-200
5025-I	C/D	150	0	0
5030-I	C/D	150	0	0
5035-I	D/E	250	0	0
5040-I	C/D	150	0	0
5105-I	B/C/D	100	-150	-150
Z1-C1	B	0	-500	-500
Z1-C2	B	0	-250	-250
Z1-D1	D	0	-600	-600
Z1-D2	D	0	-250	-250
	Total Extraction	-3356	-3557	-3899
	Total Recharge	900	0	0

TABLE H3-1: SUMMARY OF EXTRACTION WELL RATES
ZONE 2 REMEDIAL ALTERNATIVES
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Alternative Z2-2

Well ID	X-coord	Y-coord	Layer	Extraction Rate (gpm)
Z2-C1	2220102.8	336275.14	C	450
Z2-C2	2220791	335626.49	C	500
Z2-C3	2221905.3	334667.74	C	450

Alternative Z2-3

Well ID	X-coord	Y-coord	Layer	Extraction Rate (gpm)
Z2-C1	2220102.8	336275.14	C	450
Z2-C2	2220791	335626.49	C	500
Z2-C3	2221905.3	334667.74	C	450
4420	2230320	340591.1	C	150

TABLE H4-1: SUMMARY OF EXTRACTION WELL RATES
ZONE 3 EXISTING OPERATION
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Well ID	X-Coord	Y-Coord	Layers Screened	Rate (gpm)
1059	2239872.999	338168	C/D	-28
4085	2238408.999	342396.0018	C/D	-27
4095	2237268.003	342455.9972	C/D	-21
4303	2237458.998	341704.0026	C/D	-94
4400	2237631.998	337923.9994	C/D	-273
4405	2238680	341679.0014	C	-112
4410	2236522.005	337860.998	C/D	-149
4450	2237449.001	341026.0046	C/D	-119
4460	2237181.003	338364.9969	C/D	-169
4565	2235479	337639.0037	C/D	-66
4570	2234831.001	337639.9942	C/D	-61
4575	2236031.996	337641.0002	C/D	-52
4505	2232790	339230	B	-12
4510	2232921	339227	B	-4
4515	2233080	339410	B	-6
4520	2233244	339412	B	-10
4525	2233407	339411	B	-20
			Total	-1223

TABLE H4-2: SUMMARY OF EXTRACTION WELL RATES AND TRAVEL TIMES
ZONE 3 REMEDIAL ALTERNATIVE Z3-2
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Well ID	X-Coord	Y-Coord	Layers Screened	Rate (gpm)	Existing or New
4505	2232790	339230	B	-12	E
4510	2232921	339227	B	-4	E
4515	2233080	339410	B	-6	E
4520	2233244	339412	B	-10	E
4525	2233407	339411	B	-20	E
4570	2234831	337640	C/D	-400	E
Z3-C1	2233544	337408	C	-100	N
Z3-C2	2234478	335895	C	-100	N
Z3-C3	2235656	334968	C	-50	N
Z3-D1	2233544	337408	D	-100	N
Z3-D2	2234478	335895	D	-250	N
Z3-D3	2235656	334968	D	-250	N
Z3-E1	2237872	341026	E	-150	N
Z3-E2	2238802	339935	E	-75	N
Z3-E3	2239489	338641	E	-80	N
Z3-F1	2237872	341026	F	-125	N
Z3-F2	2238806	339940	F	-50	N
Z3-F3	2239489	338641	F	-120	N
			Total	-1902	

Approximate Travel Times from Source Areas to Down Gradient Wells

Layer	Years
B	24
C	32
D	28
E	17
F	16

TABLE H4-3: SUMMARY OF EXTRACTION WELL RATES AND TRAVEL TIMES
ZONE 3 REMEDIAL ALTERNATIVE Z3-3
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Well ID	X-Coord	Y-Coord	Layers Screened	Rate (gpm)	Existing or New
4505	2232790	339230	B	-12	E
4510	2232921	339227	B	-4	E
4515	2233080	339410	B	-6	E
4520	2233244	339412	B	-10	E
4525	2233407	339411	B	-20	E
4011	2238146	344226	C	-25	E
4405	2238680	341679	C	-75	E
4303	2237459	341709	C/D	-53	E
4450	2237449	341026	C/D	-150	E
4570	2234831	337640	C/D	-400	E
4475	2238668	344496	D/E/F	-100	E
4480	2237953	343904	D/E/F	-250	E
Z3-C1	2233544	337408	C	-100	N
Z3-C2	2234478	335895	C	-100	N
Z3-C3	2235656	334968	C	-50	N
Z3-D1	2233544	337408	D	-100	N
Z3-D2	2234478	335895	D	-250	N
Z3-D3	2235656	334968	D	-250	N
Z3-E1	2237872	341026	E	-150	N
Z3-E2	2238802	339935	E	-75	N
Z3-E3	2239489	338641	E	-80	N
Z3-F1	2237872	341026	F	-125	N
Z3-F2	2238806	339940	F	-50	N
Z3-F3	2239489	338641	F	-120	N
			Total	-2555	

Approximate Travel Times from Source Areas to Down Gradient Wells (years)

Layer	Z3-2 Times	From Souce to "mass" wells	from "mass" wells to dg well
B	24	12	10
C	32	16	10
D	28	12	12
E	17	5	10
F	16	6	8

TABLE H5-1: ZONE 4 GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
78	1	199.1	200.4	-1.3
79	1	167.3	168.4	-1.0
92	1	233.5	237.6	-4.1
97	1	286.9	283.3	3.7
99	1	224.7	225.3	-0.7
102	1	250.0	249.7	0.3
144	1	240.8	242.3	-1.5
150	1	234.1	235.4	-1.4
151	1	238.6	240.1	-1.5
312	1	240.2	242.0	-1.8
331	1	240.0	241.5	-1.4
361	1	244.5	244.6	-0.1
436	1	219.5	218.4	1.1
445	1	217.1	218.3	-1.2
449	1	215.2	213.7	1.4
451	1	194.9	195.4	-0.5
452	1	195.4	195.9	-0.5
453	1	171.1	173.3	-2.2
459	1	218.7	218.7	0.0
460	1	222.9	220.1	2.8
463	1	185.4	186.8	-1.4
482	1	217.4	219.6	-2.1
3095	1	213.0	212.4	0.5
3188	1	219.0	220.5	-1.5
3218	1	225.0	225.8	-0.8
3220	1	217.7	217.6	0.1
3261	1	244.3	245.2	-0.9
3262	1	240.7	243.6	-2.9
3287	1	225.2	227.6	-2.4
3368	1	201.4	201.6	-0.2
3372	1	247.2	246.3	0.9
3375	1	216.2	216.7	-0.5
3378	1	213.6	213.8	-0.3
3384	1	208.0	209.2	-1.2
3387	1	227.4	226.9	0.5
3390	1	211.8	211.9	-0.2
3395	1	206.6	207.2	-0.6
3420	1	218.7	218.8	-0.1
3473	1	249.4	253.3	-3.9
3475	1	250.1	252.9	-2.8
3487	1	225.1	229.8	-4.8
3499	1	224.5	225.2	-0.7
3504	1	193.4	193.1	0.2
3520	1	240.3	242.8	-2.6
3521	1	240.0	242.7	-2.7
3522	1	255.2	252.7	2.4
3531	1	252.4	252.6	-0.2
89	2	218.2	221.9	-3.8
456	2	179.7	179.1	0.6
465	2	195.7	195.2	0.5
3379	2	206.2	205.8	0.3
3396	2	212.8	212.7	0.0
3414	2	194.9	195.6	-0.7
3505	2	200.3	201.5	-1.2

Residual Mean (feet)	-0.78
Residual Standard Deviation (feet)	1.62
Sum of Squares	174.95
Absolute Residual Mean (feet)	1.36
Min. Residual (feet)	-4.77
Max. Residual (feet)	3.66
Range	119.59
RSD/Range	0.01

TABLE H5-2: SUMMARY OF EXTRACTION WELL RATES
ZONE 4 REMEDIAL ALTERNATIVES
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

		Flow Rate (gpm)		
Name	Model Layer	Existing	Alternative Z4-2	Alternative Z4-3
4012	A	-11	0	-11
4013	A	-4	0	-4
4100	A	-49	-49	-49
4105	A	-10	-10	-10
4110	A	-8	-8	-8
4120	A	-42	-42	-42
4125	A	-4	-4	-4
4130	A	-6	-6	-6
4430	A	-8	0	-8
4500	A	-95	-95	-95
Z4-A1	A	0	-15	-15
Z4-A2	A	0	-25	-25
Z4-A3	A	0	-100	-100
Z4-A4	A	0	-50	-50
Z4-A5	A	0	-75	-75
Z4-A6	A	0	-40	-40
Z4-A1	B	0	-125	-125
	Total Extraction	-237	-644	-667

TABLE H5-1: ZONE 4 GROUNDWATER FLOW MODEL CALIBRATION DATA
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

Observation Well ID	Model Layer	Observed Water Level (ft. msl)	Computed Water Level (ft. msl)	Residual (ft.)
78	1	199.1	200.4	-1.3
79	1	167.3	168.4	-1.0
92	1	233.5	237.6	-4.1
97	1	286.9	283.3	3.7
99	1	224.7	225.3	-0.7
102	1	250.0	249.7	0.3
144	1	240.8	242.3	-1.5
150	1	234.1	235.4	-1.4
151	1	238.6	240.1	-1.5
312	1	240.2	242.0	-1.8
331	1	240.0	241.5	-1.4
361	1	244.5	244.6	-0.1
436	1	219.5	218.4	1.1
445	1	217.1	218.3	-1.2
449	1	215.2	213.7	1.4
451	1	194.9	195.4	-0.5
452	1	195.4	195.9	-0.5
453	1	171.1	173.3	-2.2
459	1	218.7	218.7	0.0
460	1	222.9	220.1	2.8
463	1	185.4	186.8	-1.4
482	1	217.4	219.6	-2.1
3095	1	213.0	212.4	0.5
3188	1	219.0	220.5	-1.5
3218	1	225.0	225.8	-0.8
3220	1	217.7	217.6	0.1
3261	1	244.3	245.2	-0.9
3262	1	240.7	243.6	-2.9
3287	1	225.2	227.6	-2.4
3368	1	201.4	201.6	-0.2
3372	1	247.2	246.3	0.9
3375	1	216.2	216.7	-0.5
3378	1	213.6	213.8	-0.3
3384	1	208.0	209.2	-1.2
3387	1	227.4	226.9	0.5
3390	1	211.8	211.9	-0.2
3395	1	206.6	207.2	-0.6
3420	1	218.7	218.8	-0.1
3473	1	249.4	253.3	-3.9
3475	1	250.1	252.9	-2.8
3487	1	225.1	229.8	-4.8
3499	1	224.5	225.2	-0.7
3504	1	193.4	193.1	0.2
3520	1	240.3	242.8	-2.6
3521	1	240.0	242.7	-2.7
3522	1	255.2	252.7	2.4
3531	1	252.4	252.6	-0.2
89	2	218.2	221.9	-3.8
456	2	179.7	179.1	0.6
465	2	195.7	195.2	0.5
3379	2	206.2	205.8	0.3
3396	2	212.8	212.7	0.0
3414	2	194.9	195.6	-0.7
3505	2	200.3	201.5	-1.2

Residual Mean (feet)	-0.78
Residual Standard Deviation (feet)	1.62
Sum of Squares	174.95
Absolute Residual Mean (feet)	1.36
Min. Residual (feet)	-4.77
Max. Residual (feet)	3.66
Range	119.59
RSD/Range	0.01

TABLE H5-2: SUMMARY OF EXTRACTION WELL RATES
ZONE 4 REMEDIAL ALTERNATIVES
PERIMETER GROUNDWATER OPERABLE UNIT (OU-5)

		Flow Rate (gpm)		
Name	Model Layer	Existing	Alternative Z4-2	Alternative Z4-3
4012	A	-11	0	-11
4013	A	-4	0	-4
4100	A	-49	-49	-49
4105	A	-10	-10	-10
4110	A	-8	-8	-8
4120	A	-42	-42	-42
4125	A	-4	-4	-4
4130	A	-6	-6	-6
4430	A	-8	0	-8
4500	A	-95	-95	-95
Z4-A1	A	0	-15	-15
Z4-A2	A	0	-25	-25
Z4-A3	A	0	-100	-100
Z4-A4	A	0	-50	-50
Z4-A5	A	0	-75	-75
Z4-A6	A	0	-40	-40
Z4-A1	B	0	-125	-125
	Total Extraction	-237	-644	-667