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FINAL

GEIGER HEIGHTS HOUSING AREA CLEANUP LETTER REPORT

Fairchild Air Force Base, Washington

Prepared for:

Air Force Center for Environmental Excellence
Environmental Restoration Division
Brooks Air Force Base, Texas 78235-5363

Contract No. FA8903-04-D-8679
Task Order No. 0028

Prepared by:

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URS

April 18, 2008

Ms. Kristin Nester
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RE: ***Contract FA8903-04-D-8679***
Task Order 0028
Geiger Heights Housing Area Cleanup
Final Project Summary Report
URS Project No. 36298136

Dear Ms. Nester:

URS Corporation (URS) is pleased to present this summary letter report for the soil cleanup and groundwater monitoring activities at the Geiger Heights Housing Area site at Fairchild Air Force Base (AFB), Washington. This letter report presents our activities, findings, and conclusions for the above-mentioned site.

1.0 INTRODUCTION

Fairchild Air Force Base (AFB) is located approximately 12 miles west of Spokane, Washington. In July 1994, Fairchild AFB began hosting the 92nd Air Refueling Wing under Air Mobility Command. Prior to that, it was home to the now deactivated 92nd Bombardment Wing under the Air Combat Command. Fairchild AFB occupies approximately 4,300 acres and contains one major runway with numerous taxiways.

The Geiger Heights Housing (GHH) site is approximately 10 miles east-southeast of Fairchild AFB, at the southeast corner of Grove and Hallett Roads, west of the city limits of Spokane, Washington (Figure 1). The surrounding area is rural. The GHH site consists of 131 duplex and single family homes (Figure 2). Military personnel and their families once occupied the houses, but now they are vacant.

2.0 PURPOSE AND SCOPE

The purpose of this project was to enter the GHH in to the Washington State Department of Ecology's (WDOE's) Voluntary Cleanup Program (VCP) in an attempt to obtain a "No Further Action" (NFA) designation from the WDOE. As mentioned above, the subject property was and currently is enrolled in the WDOE's VCP to obtain regulatory guidance, facilitate their review of the data and attempt to achieve a NFA designation. Based upon consultations with WDOE, a NFA designation may be achieved by identifying and removing impacted soils from the site and obtaining four consecutive quarters of groundwater monitoring data where analytes are below the WDOE's Model Toxic Control Act (MTCA) Method A regulatory guidelines.

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This work was accomplished in accordance with the Geiger Heights Cleanup/Site Closure Final Work Plan, dated November 2004. In accordance with the work plan, site investigation and cleanup activities included the following tasks:

- Task 1: Groundwater monitoring well installation;
- Task 2: Groundwater monitoring well sampling;
- Task 3: Soil sampling and analysis at housing units 102, 324, and 400.
- Task 4: Excavation of petroleum-contaminated soil at housing units 102, 324, and 400;
- Task 5: Confirmation soil and groundwater sampling and analysis;
- Task 6: Petroleum contaminated soil disposal and site reclamation

3.0 SITE BACKGROUND

3.1 Site Description and Location

As mentioned above, the Geiger Heights Housing (GHH) site consists of 131 duplex and single-family homes (Figure 3). It is approximately 10 miles east-southeast of Fairchild AFB, at the southeast corner of Grove and Hallett Roads, west of the city limits of Spokane, Washington. The site was utilized in the past to provide family housing for military personnel stationed at Fairchild AFB. Currently the housing units are unoccupied.

In 1958, 300-gallon steel underground storage tanks (USTs) were installed at each of the housing units at GHH. The USTs were used to store No. 2 heating oil and were located adjacent to the sidewalk and left of the driveways when facing each house. In 1993 nine of the tanks were confirmed to be leaking and replaced.

In 1994 heating at all of the GHH units was converted from oil to natural gas. At that time all of the USTs and approximately 600 tons of impacted soils were removed from the site. Each tank excavation was located zero to ten feet from the edge of each driveway, was about eight feet long by eight feet wide by five feet deep. Excavation activities were limited to the removal of the USTs and did not encompass the removal of additional petroleum contaminated soil.

3.2 Previous Environmental Investigations

Three environmental investigations have been performed at the GHH site. In 1993 E.P. Johnson Construction and Environmental Inc. performed a Site Assessment for UST Decommissioning in conjunction with the removal of the nine USTs found to be leaking. In 1994 Rob's Demolition performed a Site Assessment for UST Decommissioning in conjunction with the removal of all 131 USTs at the site. In 2000, Dames and Moore, now a URS company, performed a Preliminary

Remedial Investigation (PRI) to assess the extent of residual petroleum contamination in site soils and groundwater.

The E.P. Johnson report presents the results of the removal action to excavate and replace the first nine leaking tanks discovered at GHH. Soil samples at 8 of the 9 sites had TPH-D levels exceeding the MTCA cleanup level of 2000 ppm. Shallow groundwater was reported at all excavations between 4 and 6 below ground surface (bgs). Ground water samples were obtained from all nine of the excavations and three were found to have TPH-D levels exceeding the MTCA cleanup level of 500 ppb.

The Rob's Demolition report presents the results of the removal action to excavate and remove all USTs at the GHH site. A total of 131 tanks were removed. This included removal of the 9 new tanks just placed into service in 1993 plus 122 original tanks. Excavations were 5 to 6.5 feet deep. Surface soils consisted of silts and sands to about 3 feet and gravel and cobbles to a fractured basalt contact at about 6 to 7 feet. Three soil samples were obtained from the excavations; one from the soils that occurred below the tank after removal; and, two from opposite sidewalls of the excavation. Where groundwater was present, a groundwater sample was substituted for the soil sample in the base of the excavation. Of the 122 locations where the original tanks were removed 23 were reported with soil and or groundwater contamination exceeding cleanup levels in at least one of the three samples.

The purpose of the Dames and Moore Preliminary Remedial Investigation was to determine the extent of petroleum contamination left at the GHH site after the tank removal in 1994. Thirty-seven soil samples, nine grab groundwater samples, and nine well groundwater samples were taken during this investigation. Analytical results indicated that soils at units 102 and 400 and groundwater at units 102 and 324 were above MTCA Method A cleanup levels.

3.3 Environmental Setting

3.3.1 Topography

The GHH site is located approximately three miles southwest of the Spokane City limits in the NW ¼ of Section 10, Township 24 North, Range 46 East. The United States Geologic Survey (USGS) 7.5 Minute Series Topographic Map of Spokane SW, Washington, provides topographic map coverage of the site. The elevation of the site is approximately 2,330 feet above mean sea level (msl) and there is a minor decrease in topographic relief across the site towards the east.

The nearest body of surface water is Marshall Creek, located approximately 1.5-miles south of the GHH site. Stormwater runoff is collected by a storm sewer system that discharges by gravity to a drainage ditch near the two abandoned lagoons located approximately 0.5-mile south of the site. The drainage ditch is dry during a significant portion of the year. Roof runoff is collected by gutters

and discharged into the lawns or flower beds adjacent to the houses.

3.3.2 Soils

In general, the soils at the GHH site were found to be silt-clay mixtures of low to medium plasticity containing five to 15 percent of angular gravel and/or cobbles. Slightly weathered to competent bedrock was encountered at the base of the excavations at each unit. Bedrock was encountered at approximately 9 feet bgs at unit 400, 5 feet bgs at unit 324, and 6 feet bgs at unit 102.

3.3.3 Geologic Setting

The GHH site lies on glacial sediments of Wisconsin age (80,000-32,000 years before present) (Griggs, 1973). Continental ice lobes flowed south from British Columbia into Northern Idaho and Eastern Washington. The Bull Lake Subage glaciation was the most extensive of the Pleistocene glaciers, and the ice lobes reached almost to the northern end of Lake Coeur d'Alene.

The glacial sediments are underlain by rocks of the Tertiary age (from two to 65 million years old) Columbia River Basalt Group (Griggs, 1973). The basalts were deposited on surfaces of varying topographic relief that caused lateral variations in its thickness. These basalts were erupted from a series of volcanic centers in southeast Washington and adjacent Oregon and cover most of the southeast quadrant of Washington. The resulting physiographic feature is known as the Columbia Plateau. Spokane lies on the eastern edge of this basalt plateau where lava flows encroached on the edge of existing bedrock highlands. The basalts underlying the Spokane area are mapped as the Wanapum Formation basalts. The Wanapum Formation is extensively exposed at the surface of the Columbia River Basalts (Swanson and Wright, 1981). Wanapum basalts are encountered at eight to ten feet below ground surface at the site (Budinger, 1998).

3.3.4 Hydrogeologic Setting

Regional groundwater flow direction in the shallow water-bearing zone was inferred to be towards the northeast based on the topographic relief of the area (USGS, 1986). During past investigations, groundwater on-site was encountered in perched conditions within the unconsolidated deposits overlying the basalt. Water table elevations indicated that a topographic ridge was present at approximately the center of the site and groundwater flowed from the ridge towards the southeast and southwest.

Water table elevations were collected from all site monitoring wells at each quarterly groundwater sampling event. These water table elevations also indicate that a topographic ridge is present at approximately the center of the site. Groundwater was encountered between 1.77 and 8.86 feet below ground surface and appears to flow to the southeast and southwest. A potentiometric surface map generated from July 2005 elevation data is presented as Figures 4. Groundwater elevation data

from groundwater sampling events are presented in Appendix A.

4.0 FIELD ACTIVITIES

URS was contracted to collect soil and groundwater samples, arrange for laboratory analyses, oversee monitoring well installation and soil excavation/disposal activities, and report on the site investigation and cleanup activities conducted at the Geiger Heights Housing Area.

The work summarized in this document was completed in accordance with procedures and specifications published in the Final 2004 Geiger Heights Cleanup/Site Closure Quality Program Plan (QPP) which includes the Field Sampling Plan (FSP), Health and Safety Plan (HSP), Quality Assurance Program Plan (QAPP), and Work Plan (WP).

URS subcontracted Environmental West Exploration of Spokane, Washington to install and develop groundwater-monitoring wells in accordance with Ecology Standards for construction of wells (WAC 173-160). URS subcontracted NRC Environmental Services of Spokane, Washington to excavate and stockpile the contaminated soil. URS subcontracted USKH to survey monitoring well locations. Field logs and photographs were used by URS to document the soil cleanup and groundwater monitoring activities.

4.1 Groundwater Monitoring Well Installation

URS subcontracted Environmental West Exploration Inc. (Environmental West) of Spokane, Washington to install three new flush-mounted groundwater-monitoring wells. URS observed Environmental West's fieldwork for compliance with QPP specifications. Soil samples were collected prior to the installation of each well. Boring logs were completed and soils were submitted for laboratory analysis. Boring logs for each well installation are in Appendix B. Soil cuttings were drummed and disposed of with soils excavated at housing units 102, 324 and 400.

The wells MW-10, 11, and 12 were installed to fill data gaps, providing information regarding off-site impacts. MW-10, 11, and 12 were located hydraulically down gradient of the three areas of the site where soil contamination were observed and subsequent contaminated soil removal/cleanup actions were required. MW-10 was installed in the southeast corner of the site which is hydraulically down gradient of 324 Eichenberger Place. MW-11 was installed along the western boundary of the site which is hydraulically down gradient of 102 A & B Armstrong Drive. MW-12 was installed in the northeast corner of the site which is located hydraulically down gradient of 400 Mitchell Place.

The three new monitoring wells in conjunction with the existing monitoring wells are intended to yield information pertaining to the groundwater conditions across the Geiger Heights Housing Area site, as well as, the condition of the groundwater that flows off site.

The wells were installed in accordance with Ecology Standards for construction of wells (WAC 173-160) and the FSP. Each well screen is 5-feet long, 2-inch diameter, Schedule 40 PVC with 0.010-inch screen slots. The water table was encountered at approximately 2, 4.5 and 8 feet bgs at the well locations. The wells were screened between three and eight feet bgs. The wells were developed following the procedures outlined in the FSP. Well construction logs are presented in Appendix B. The locations of the monitoring wells are shown in Figure 5. USKH surveyed the new monitoring wells using an assumed datum and provided elevations relative to existing monitoring wells. The well coordinates are presented in Appendix D.

Ecology had originally speculated that a deeper groundwater monitoring well may be needed to assess the conditions of the deeper aquifer beneath the Geiger Heights Housing Area. However, based on the nature and extent of the groundwater data that was collected during the multiple groundwater sampling events, which demonstrated the groundwater was mostly non-detect or only indicated that low level concentrations of the contaminants of concern were present in the perched groundwater aquifer, Ecology did not require the installation of a monitoring well in to the deeper aquifer.

4.2 Groundwater Sampling

The GHH WP & FSP specified that groundwater monitoring wells would be sampled for 4 consecutive quarters. The first quarter sampling event would include all twelve monitoring wells at the site. The subsequent three sampling events would include six wells chosen on the basis of the first sampling events results and there proximity to housing units 102, 324, and 400. Monitoring wells 2, 7, 9, 10, 11, and 12 where chosen for sampling in quarters 2, 3 and 4. The initial sampling event (quarter 1) was on October 28, 2004. Due to lab error two additional sampling events were required to achieve reliable analytical results. The additional 1st quarter sampling events were on November 15, 2004, and November 22, 2004. The second quarter sampling event was on February 3, 2005, the third quarter was on April 25, 2005, and the fourth quarter was on July 21, 2005. A groundwater sample from MW-9 sent to EMAX laboratories was broken during shipment. MW-9 was resampled on August 5, 2005. In an attempt to achieve four consecutive quarters of sampling/analytical results below the MTCA Method A cleanup levels in all the wells, additional groundwater sampling events were conducted at MW-2 on December 1, 2005 and at MW-9 on December 1, 2005, October 10, 2006, and February 2, 2007.

A low-flow, minimal draw down technique was utilized for groundwater sampling. Before purging depth to water measurements were taken at all wells. Well purging was done at a flow rate between 0.1 and 0.5 L/min. During purging specific conductance, temperature, pH, dissolved oxygen and turbidity measurements were taken with a Horiba U22 Water Quality Meter every 3 minutes. Samples were taken once the water quality parameters stabilized. Stabilization was achieved when successive water quality measurements had a difference of less than 10%. Samples were packaged and transported under Chain-of-Custody procedures to the laboratory. Decontamination, record

keeping, and purge water disposal was performed in accordance with the QPP.

4.3 Soil sampling and analysis at housing units 102, 324, and 400

The purpose of this task was to assess soils at the 3 housing units identified in the 2000 investigation. The goal was to determine which contaminants exceeded the MTCA Method A cleanup levels and define the excavation boundaries. The plan called for multiple hand augered samples to be collected at each of the housing units and field screened for the presence of petroleum products. Two samples from each housing unit would be sent to a certified analytical laboratory for analysis.

URS attempted between three and six hand auger borings in the vicinity of the former USTs at housing units 102, 324 and 400. Refusal due to gravels and cobbles was encountered at depths ranging from 1 to 3 feet bgs. PID readings were at or below background levels for the screened shallow soils. No groundwater was encountered in any of these borings. Soil samples were not collected for laboratory analysis at these locations since representative soil samples from below the level of the former USTs could not be obtained.

4.4 Excavation of petroleum-contaminated soil at housing units 102, 324, and 400

URS subcontracted NRC Environmental Services Inc, Spokane, WA to excavate petroleum contaminated soils at housing units 102, 324, and 400. Test pits were excavated at each housing unit in lieu of hand auger samples mentioned above. Field screening techniques were utilized to determine if the soils were contaminated. Soils at each of these sites appeared to be contaminated, based upon their discoloration, a notable petroleum odor, and elevated PID readings.

Excavation activities were done in two phases. The first phase was conducted in December 2004. Contaminated soils at each housing unit were excavated until field screening determined the boundary of the contaminated soils had been reached. In several instances a utility, driveway/sidewalk, or the housing unit itself was encountered before field screening indicated that the boundary of the contaminated soils was reached. In these instances excavation was stopped. Soil samples were taken from each sidewall to confirm that the boundary of contaminated soils had been reached or to determine the concentration of contamination in the soils that were left under the utilities, driveway/sidewalks or the housing unit.

The second phase of excavation was conducted in March 2005. Based on the analytical results of phase one soil sampling the decision was made to remove sewer lines and driveway/sidewalks to access more of the contaminated soil. Gas lines, water lines, and the housing unit themselves were left intact.

During both phases (I and II) contaminated soils were found below uncontaminated surface soils at

each unit. URS excavated uncontaminated surface soils and set them in stockpiles at each unit. Contaminated soils were excavated and set in a separate stockpile on plastic sheeting then covered with plastic sheeting. Soils from each stockpile of uncontaminated surface soil were sampled to determine whether they were acceptable for backfill. Soils from contaminated stockpiles were hauled to Graham Road landfill for disposal.

4.4.1 Unit 400 Mitchell Place Phase I

At Unit 400, contaminated soil was identified at six feet below ground surface (bgs) and extended down to bedrock at 9 feet bgs. The contaminated soil was a grey/green color, had a notable petroleum odor, and PID readings reached 71 ppm. Soils were excavated from an area 63 feet long by 6 feet wide, and were bound by the driveway to the north, a gas line to the east, and water and sewer lines to the west (Figure 6). Field screening indicated that the boundary of the contaminated soils had been reached on the south wall of the excavation. Excavation in the north, east, and west directions were stopped due to site restrictions. A total of 131 cubic yards of soil, 41 of which were contaminated, were excavated from the site. The contaminated soil was hauled to Graham road landfill for disposal.

4.4.2 Unit 400 Mitchell Place Phase II

Analytical results from composite soil samples taken from each wall of the excavation indicated that the boundary of contaminated soils had been reached on the south and east walls but not on the west and north.

In March 2005 the driveway and the sewer line were removed to allow access to additional contaminated soil. The excavation extended 22 feet beyond the original north wall, and 12 feet beyond the original west wall (Figure 7). Field screening of soils from the west wall indicated that contaminated soils were still present but further excavation would undermine the foundation of the house. The west wall did extend beyond the house and excavation to the west was continued on the portion of the wall that was not confined by the foundation. On that portion the west wall the boundary of contaminated soil was reached at 16 feet beyond the original excavation.

An additional 391 cubic yards of soil, 121 of which were contaminated, were excavated from the site. The contaminated soil was hauled to Graham road landfill for disposal.

4.4.3 Unit 324 Eichenberger Place Phase I

At Unit 324 contaminated soil was identified between 2 and 3 feet bgs and extended to bedrock at 5 feet bgs. The contaminated soil was a grey/green color, had a notable petroleum odor, and PID readings reached 41.3 ppm. Soils were excavated from an area 35 feet long by 12 feet wide, though a corridor was left around a water line (Figure 8). The excavation was bound by the driveway to the

west, a gas line to the north, and the house to the south. Field screening indicated that the boundary of the contaminated soils had been reached on the east wall of the excavation. Excavation in the north, south, and west directions was stopped due to site restrictions. A total of 98 cubic yards of soil, 44 of which were contaminated, were excavated from this site. The contaminated soil was hauled to Graham Road landfill for disposal.

4.4.4 Unit 324 Eichenberger Place Phase II

Analytical results from composite soil samples taken from each wall of the excavation indicated that the boundary of contaminated soils had been reached on the north and east walls but not on the west and south.

In March 2005 the driveway and the sidewalk were removed to allow access to additional contaminated soil. Excavation to the west extended 4 feet beyond the original west wall, and 3 feet beyond the original south wall (Figure 9). In both directions field screening indicated that the boundary of contaminated soils had been reached. An additional 39 cubic yards, 23 of which were contaminated, were excavated from the site. The contaminated soil was hauled to Graham Road landfill for disposal.

4.4.5 Unit 102 Armstrong Drive

Unit 102 is a duplex with housing unit 102A being located west of housing unit 102B. At this location contaminated soils were identified at three feet bgs and extended down to bedrock at six feet bgs. The contaminated soil was a grey/green color, had a notable petroleum odor, and PID readings reached 1461 ppm. Soils were excavated in front of both sides of the duplex during both phases and extended to the back and side yard of 102A in phase II.

4.4.6 Unit 102 B Armstrong Drive Phase I

At unit 102B contaminated soil was identified at 3 feet bgs and extended to bedrock at 6 feet bgs. Soils were excavated from an area 20 feet long by 15 feet wide (Figure 10). Excavation beyond that area was prohibited by the sidewalk to the south, the driveway to the west, a gas line to the north and a water line to the east. A test pit was excavated in the backyard of unit 102B. Field screening indicated that contaminated soil were not present in the backyard.

4.4.7 Unit 102B Armstrong Drive Phase II

Analytical results from composite soil samples taken from each wall of the excavation indicated that the boundary of impacted soils had been reached on the north, west and east walls but not on the south. Analytical results from the sample taken from the test pit in the backyard indicated that contaminated soils were not present.

In March 2005 the sidewalk was removed to allow access to additional contaminated soil. Excavation to the south extended 3 feet beyond the original excavation (Figure 11). An additional 14 cubic yards of soil, 7 of which were contaminated, were excavated from the site. The contaminated soil was hauled to Graham Road landfill for disposal.

4.4.8 Unit 102A Armstrong Drive Phase I

At unit 102A contaminated soils were identified at 3 feet bgs and extended to bedrock at 6 feet bgs. Soils were excavated from an area that was 65 feet long by 20 feet wide and extended from the driveway to the street, although corridors were left in place around water, sewer and gas lines (Figure 10). Excavation beyond that area was prohibited by a sidewalk to the south, a driveway to the east, a gas line to the north and a sidewalk to the west. A total of 339 cubic yards, of which 198 were contaminated, were excavated from this site. The contaminated soil was hauled to Graham Road landfill for disposal. A test pit was excavated in the backyard of unit 102A. Field screening indicated that contaminated soil was also present in the backyard.

4.4.9 Unit 102A Armstrong Drive Phase II

Analytical results from composite soil samples taken from each wall of the excavation indicated that the boundary of contaminated soils had not been reached in any direction. Analytical results from the sample taken from the test pit in the backyard indicated that contaminated soils were present.

In March 2005 the driveway and sidewalk were removed to allow additional access to contaminated soil. In addition the gas line was located with a hand shovel to allow more excavation on the north wall. Excavation extended and additional 8 feet to the east and 3 feet to the north (Figure 11). On the west side of the house the excavation extended to the gas line on the west and 30 feet to the south. Excavation in the backyard extended 10 feet beyond the west edge of the house, 25 feet south of the house, and to the west edge of unit 102B. An additional 526 cubic yards of soil, of which 228 were contaminated, were excavated from the site. The contaminated soil was hauled to Graham Road landfill for disposal.

4.5 Confirmation sampling

Confirmation sampling followed both Phase I and II of the excavation activities. Phase I confirmation sampling was completed on December 2 and December 8, 2004. Twenty-four soil samples and two quality control samples were collected and submitted for laboratory analysis. Phase II confirmation sampling was completed on May 25 and May 26, 2005. Fifteen soil samples and two quality control samples were collected and submitted for analysis. Each sample was analyzed for total petroleum hydrocarbons-diesel using method NWTPH-Dx, benzene, toluene, ethylbenzene, and total xylenes using EPA method 8260B, and polyaromatic hydrocarbons (PAHs) using EPA method 8310. Sample collection and handling was conducted in accordance with the

Final QPP.

4.6 Soil disposal and site reclamation

Contaminated soils were transported by Circle M Trucking to Waste Management's Graham Road Landfill for disposal under permit #1073. Soil disposal reciepts are presented in Appendix E. NRC Environmental Services backfilled the excavations with clean soil from the site, clean soil provided by the Fairchild AFB from the building 2452 foundation demolition site, and clean crushed concrete from Graham Road Landfill.

5.0 ANALYTICAL RESULTS

URS subcontracted with Ecology & Environment, Analytical Resources Inc. and Emax Laboratories Inc. to analyze soil and groundwater samples for this project. Analytical Resources Inc. performed method NWTPH-Dx for diesel. Ecology and Environment performed method 8260B for Volatile Organic Compounds and method 8310 for Polynuclear Aromatic Hydrocarbons. In January 2005 Ecology and Environment closed and Emax Laboratories was selected to perform methods 8260 and 8310 for the remainder of the project .

5.1 Groundwater Analytical Results

The groundwater samples were analyzed for BTEX compounds, Naphthalenes, Carcinogenic PAHs, and NWTPH-Dx, per Model Toxic Control Act (MTCA) 173-340-900, 173-340-900, Table 830-1 Required Testing for Petroleum Releases, DRO (3). The results are summarized below and presented in Appendix C - Table 5-1.

Concentrations of diesel, BTEX components, and napthalelenes in groundwater samples collected on **October 28, 2004** were non-detect in each of the wells sampled except for MW-9. Low levels of diesel, ethylbenzene, xylenes, and napthalenes were found in the groundwater sample from MW-9. Each of these analytes were lower than MTCA Method A cleanup levels.

The MTCA cleanup level for carcinogenic PAHs is 0.1 ug/L. The carcinogenic PAH level is the total concentration of the individual carcinogenic PAH compounds. Concentrations of carcinogenic PAHs ranged from non-detect to 0.084 ug/L in MWs 1, 4, 7, 8, 9, 10, 11 and 12, which are below the MTCA cleanup level. The concentration of carcinogenic PAHs in the groundwater sample collected from MW-2 was 0.114 ug/L. This exceeds the MTCA cleanup level.

Concentrations of diesel, carcinogenic PAHs, and napthalelenes in groundwater samples collected on **February 3, 2005** were non-detect in each of the wells sampled except for MW-9. The concentration of diesel was 1200 ug/L which exceeds the MTCA method A cleanup level.

Naphthalenes and Carcinogenic PAHs were both found below the cleanup level at 9.3 ug/L and 0.091 ug/L respectively.

Concentrations of diesel, BTEX components, carcinogenic PAHs, and napthalelenes in groundwater samples collected on **April 25, 2005** were non-detect in each of the wells sampled except for MW-9. The concentration of diesel was 920 ug/L which exceeds the MTCA method A cleanup level. Naphthalenes and Ethylbenzene were both found below the cleanup level at 9.3 ug/L and 7.6 ug/L respectively.

Concentrations of diesel, carcinogenic PAHs, and napthalelenes in groundwater samples collected on **July 21, 2005** were non-detect in each of the wells sampled except for MW-9. Diesel and naphthalenes were found at concentrations below MTCA A cleanup levels at 420 ug/L and 43.3 ug/L respectively.

Concentrations of diesel in groundwater samples collected on **December 1, 2005** were at detectable concentration levels in MW-9. Diesel was detected at concentrations below MTCA A cleanup levels at 280 ug/L.

Concentrations of diesel in groundwater samples collected on **October 10, 2006** from MW-9 were non-detect.

Concentrations of diesel in groundwater samples collected on **February 1, 2007** were at detectable concentration levels in MW-9. Diesel was detected at concentrations above the MTCA A cleanup levels at 2200 ug/L.

5.2 Soil Analytical Results

The soil samples were analyzed for BTEX compounds, Naphthalenes, Carcinogenic PAHs, and NWTPH-Dx, per Model Toxic Control Act (MTCA) 173-340-900, 173-340-900, Table 830-1 Required Testing for Petroleum Releases, DRO (3). The results are summarized below and presented in Appendix C – Table 5-2.

5.2.1 Monitoring Well Installation

Three soil samples, one from each well, were collected during the installation of monitoring wells. No analytes were found that exceeded MTCA method A cleanup levels. The only detection in sample GHH-MW10-0104 from monitoring well 10 was for carcinogenic PAHs at 7.0 ug/Kg. Toluene and carcinogenic PAHs were found in GHH-MW11-0116 at 2.89 ug/Kg and 2.2 ug/Kg respectively. Benzene, toluene, carcinogeneic PAHs and non-carcinogenic PAHs were found in GHH-MW12-0124 at 1.24 ug/Kg, 22.61 ug/Kg, 5.4 ug/Kg, and 35.5 ug/Kg respectively. All detections, with the exception of toluene in GHH-MW12-0124, were below the reporting limit.

5.2.2 Unit 400 Mitchell Place

- Diesel, xylenes, naphthalenes and carcinogenic PAHs all exceeded MTCA cleanup levels in the contaminated soils stockpile. Ethylbenzene was detected at 2.68 ppm which is under the MTCA cleanup level. PCB's were not detected.
- There was no detection of any analytes in the soil pile proposed as backfill.

Phase I Excavation Confirmation Soil Sampling:

- Diesel, naphthalenes and carcinogenic PAHs all exceeded MTCA cleanup levels in the composite sample taken from the north wall of the excavation. Xylenes and ethylbenze were detected at 2.21 ppm and 0.26 ppm respectively which are lower than the MTCA cleanup level.
- Diesel and carcinogenic PAHs were detected at 8 ppm and 0.006 ppm respectively in the composite soil sample taken from the south wall of the excavation. Those concentrations are below the MTCA cleanup standards. All other analytes were not detected
- Diesel, naphthalenes, and carcinogenic PAHs were found at 210 ppm, 0.977, and 0.023 respectively in the composite soil sample taken from the east wall of the excavation. Those concentrations do not exceed the MTCA cleanup standards. All other analytes were not detected.
- Diesel, naphthalenes, and carcinogenic PAHs were found at concentrations that exceed MTCA cleanup levels in the composite soil sample taken from the west wall of the excavation. Xylenes were detected at 5.54 ppm which is lower than the MTCA cleanup level.

Phase II Excavation Confirmation Soil Sampling:

- All analytes were non-detect in the composite soil sample taken from the north wall of the excavation.
- No additional confirmation samples were collected from the south wall during phase II excavation activities.
- No additional confirmation samples were collected from the east wall during phase II excavation activities.
- All analytes were non-detect in the composite soil sample collected from the west wall on the north end of the excavation that extends in to the north side wall.
- Diesel and carcinogenic PAHs were found at detectable concentrations in the composite soil sample collected from the soils under the house on the west wall of the excavation. Diesel was detected at a concentration of 1300 ppm which is below the MTCA Method A cleanup levels. Carcinogenic PAHs were detected at a cumulative concentration of .015 ppm which is below the MTCA Method A cleanup levels.

5.2.3 Unit 324 Eichenberger Place

- Diesel exceeded MTCA cleanup levels in the contaminated soils stockpile. All other analytes were not detected.
- A concentration of 39 ppm Diesel and 0.0062 ppm carcinogenic PAHs were detected in the soil stockpile proposed as backfill. Both concentrations are under 10 % of the MTCA cleanup level and were determined to be acceptable as backfill.

Phase I Excavation Confirmation Soil Sampling:

- All analytes were below the MTCA cleanup level in the composite soil sample taken from the north wall of the excavation. Diesel was 39 ppm, naphthalenes were 0.0273 ppm, carcinogenic PAHs were 0.0062 ppm, and BTEX compounds were all non-detect.
- Analytical results for the composite soil sample collected from the south wall indicated the diesel concentration was 1000 ppm, naphthalenes concentrations were 0.7973 ppm, and all BTEX compounds were non-detect. However, the Diesel, naphthalenes and BTEX compounds concentrations were all below the MTCA cleanup levels. Carcinogenic PAHs were detected at a concentration of 1.10 ppm which is above the MTCA cleanup level.
- All analytes were non-detect in the composite soil sample taken from the east wall of the excavation.
- Diesel, naphthalenes and BTEX compounds were all below the MTCA cleanup levels in the composite soil sample collected from the west wall of the excavation. Diesel was 310 ppm, naphthalenes were 0.1908 ppm, and all BTEX compounds were non-detect. Carcinogenic PAHs were found at 0.30 ppm which is above the MTCA cleanup level.

Phase II Excavation Confirmation Soil Sampling:

- No additional confirmation samples were collected from the north wall during phase II excavation activities.
- PAHs were non-detectable after the second phase of the excavation activities were completed on the south wall. Diesel was detected at a concentration of 7.4 ppm in the composite soil sample collected from the south wall of the excavation, which is below the MTCA Method A cleanup levels.
- No additional confirmation samples were collected from the east wall during phase II excavation activities.
- All analytes were non-detect in the composite soil sample taken from the west wall of the excavation.

5.2.4 Unit 102A Armstrong Drive

- Benzene, toluene, and PCB's were not detected in the contaminated soil stockpile. Ethylbenzene, xylenes, and carcinogenic PAHs were detected at concentrations below MTCA cleanup levels 1.292 ppm, 0.461 ppm, & 0.030 ppm respectively. Diesel was at the MTCA cleanup level of 2000 ppm and napthalenes exceeded the MTCA cleanup level.
- There was no detection of any analytes in the soil stockpile proposed as backfill.

Phase I Excavation Confirmation Soil Sampling:

- Diesel, naphthalenes, and carcinogenic PAHs were all above MTCA cleanup standards in the composite soil sample taken from the north wall of the excavation. Bezene, toluene and xylenes were not detected and ethylbenzene was found below MTCA cleanup levels at 0.194 ppm.
- Diesel, naphthalenes, and carcinogenic PAHs were all above MTCA cleanup standards in the composite soil sample taken from the south wall of the excavation. Benzene was not detected. Toluene, ethylbenzene, and xylenes were found below the MTCA cleanup standards at 0.016 ppm, 0.012 ppm, and 0.013 ppm respectively.
- Diesel, naphthalenes, and carcinogenic PAHs were all above MTCA cleanup standards in the composite soil sample taken from the east wall of the excavation. Benzene and toluene were not detected. Ethylbenzene and xylenes were found below the MTCA cleanup standards at 0.593 ppm and 0.518 ppm respectively.
- Diesel and naphthalenes were found above MTCA cleanup standards in the composite soil sample taken from the west wall of the excavation. Carcinogenic PAHs, bezene, and toluene were not detected. Ethlybenzene and xylenes were below the MTCA cleanup levels at 0.372 ppm and 0.249 ppm respectively.
- Diesel and naphthalenes were found above the MTCA cleanup standards in the soil sample taken from the test pit behind unit 102A. Carcinogenic PAHs, benzene, toluene, and xylenes were not detected. Ethylbenzene was found below the MTCA cleanup level at 0.0746 ppm.

Phase II Excavation Confirmation Soil Sampling:

- Diesel, xylenes, and carcinogenic PAHs were detected below MTCA cleanup levels at 22 ppm, 0.0077 ppm, and 0.011 ppm respectively in the composite soil sample taken from the north wall of the excavation.
- Carcinogenic PAHs was detected above MTCA cleanup standards in the composite soil sample taken from the south wall of the excavation in the front yard. Carcinogenic PAHs were detected at 1.0 ppm. BTEX constituents were not detected. Diesel and naphthalenes were detected below the MTCA cleanup levels at 1200 ppm and 2.71 ppm respectively.
- All analytes were non-detect in the composite soil sample collected from the west wall of the

excavation.

- All analytes were non-detect in the composite soil samples collected from the south and west walls of the excavation on the south side (back yard) of the housing unit 102 A.
- Diesel, BTEX, and naphthalenes were not detected in the composite sample collected from the east wall of the excavation on the south side (back yard) of housing unit 102A. Carcinogenic PAHs were detected at 0.014 ppm which is below the MTCA Method A cleanup level.
- Diesel, naphthalenes, and carcinogenic PAHs were detected below the MTCA cleanup levels at 31 ppm, 0.24 ppm, and 0.042 ppm respectively in the soil sample collected from the north wall of the excavation on the south side (back yard) of housing unit 102A. BTEX constituents were not detected in the above mentioned sample from the north wall.

5.2.5 Unit 102B Armstrong Drive

Phase I Excavation Confirmation Soil Sampling:

- BTEX compounds, naphthalenes, and diesel were not detected in the composite soil sample taken from the north wall of the excavation. Carcinogenic PAHs were found below the MTCA cleanup level at 0.055 ppm.
- BTEX compounds were not detected in the composite soil sample taken from the south wall of the excavation. Diesel and naphpthalenes were below the MTCA cleanup level at 1600 ppm and 0.069 ppm respectively. Carcinogenic PAHs were found above the MTCA cleanup level.
- BTEX compounds and naphthalenes were not detected in the composite soil sample taken from the east wall of the excavation. Diesel and carcinogenic PAHs were found below MTCA cleanup standards at 330 ppm and 0.055 ppm respectively.
- BTEX compounds, naphthalenes and carcinogenic PAHs were not detected in the composite soil sample taken from the west wall of the excavation. Diesel was found below the MTCA cleanup standards at 75 ppm.
- There was no detection of any analytes in the soil sample taken from the test pit excavated behind unit 102B.

Phase II Excavation Confirmation Soil Sampling:

- Diesel and carcinogenic PAHs were detected below MTCA cleanup levels at 15 ppm and 0.042 ppm respectively in the composite soil sample taken from the north wall on the east end of the excavation. Additionally, diesel and carcinogenic PAHs were detected below MTCA cleanup levels at 69 ppm and 0.055 ppm respectively in the composite soil sample taken from the north wall on the east end of the excavation.
- Diesel and naphthalenes were detected below the MTCA cleanup levels at 15 ppm and 0.069

ppm respectively in the soil sample collected from the south wall of the excavation on the east end (front yard) of housing unit 102B. BTEX constituents and carcinogenic PAHs were not detected in the above mentioned sample from the south wall.

- Diesel, ethylbenzene, and carcinogenic PAHs were detected below the MTCA cleanup levels at 330 ppm, 0.074 ppm, and 0.055 ppm respectively in the soil sample collected from the east wall (front yard) of the excavation of housing unit 102B. Benzene, toluene, xylenes, and carcinogenic PAHs were not detected in the above mentioned sample from the east wall.

6.0 CONCLUSIONS

The following conclusions are based on the information presented in this report:

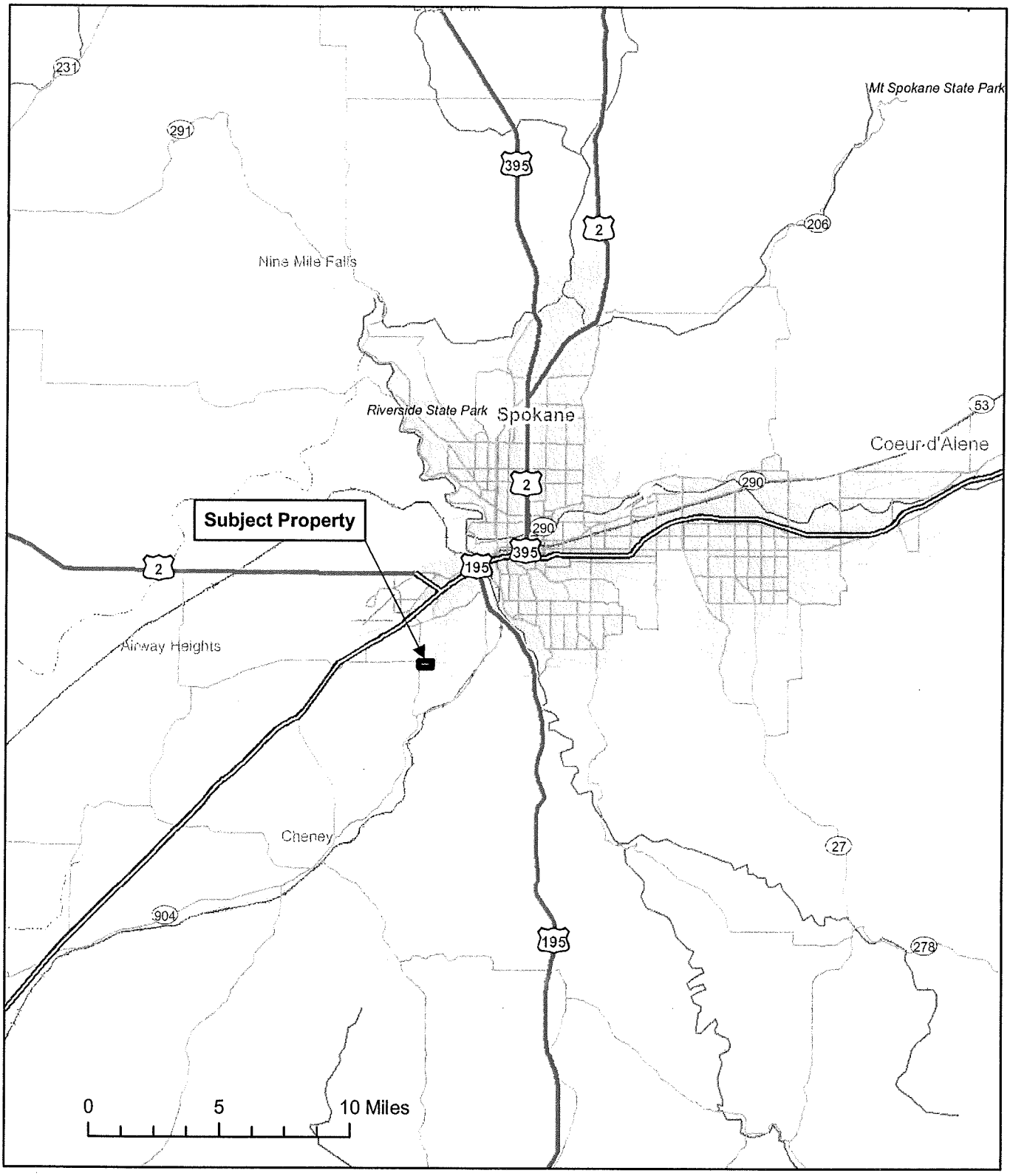
- The purpose of this project was to attempt to obtain an NFA designation from the WDOE for the Geiger Heights Housing Area. Based on consultations between URS, FAFB, and WDOE an NFA can be attained when targeted contaminated soils have been removed, soil sample results confirm their removal, and results from four consecutive quarters of groundwater sampling are below the MTCA Method A cleanup levels.
- 131 UST's were removed from the site in 1994. Based on a preliminary remedial investigation done in 2000, three housing units, 400 Mitchell Place, 324 Eichenberger Place, and 102 Armstrong Drive, were selected for further investigation.
- Test pits at the three housing units were excavated. Field screening indicated the presence of petroleum contaminated soils at the three housing units.
- Approximately 162 cu. yds. of contaminated soil were excavated at housing unit 400 Mitchell Place. The soil was hauled to Graham road landfill for disposal.
- Approximately 67 cu. yds. of contaminated soil were excavated at housing unit 324 Eichenberger Place. The soil was hauled to Graham road landfill for disposal.
- Approximately 466 cu. yds. of contaminated soil were excavated at housing units 102A and B Armstrong drive. The soil was hauled to Graham road landfill for disposal.
- Confirmation samples collected from the excavation at housing unit 400 Mitchell Place indicate contaminated soil above the MTCA Method A cleanup levels have been excavated from the site and disposed of at Graham road landfill.
- Confirmation samples collected from the excavation at housing unit 324 Eichenberger Place indicate the contaminated soil above MTCA Method A cleanup levels have been excavated from the site and disposed of at Graham Road landfill.
- Confirmation samples collected from the excavation at housing unit 102A and 102B Armstrong Drive indicate the contaminated soil above the MTCA Method A cleanup levels have been removed from the site except for a small amount of soil underneath the foundation of the house on the north side. The soil appear to be contaminated with carcinogenic PAHs. The contaminated soil could not be removed without undermining the foundation of the house.

- Nine groundwater monitoring wells exist at the site MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9. Three additional wells MW-10, MW-11, and MW-12 were installed to further characterize potential impacts to groundwater at the site.
- Monitoring wells MW-2, MW-7, MW-10, MW-11,and MW-12 were sampled for four consecutive quarters. Analytical results from the four quarters indicated the contaminants of concern (Diesel and Carcinogenic PAHs) in the wells were below the MTCA Method A cleanup levels for groundwater.
- Monitoring well MW-9 was sampled for four consecutive quarters. Analytical results from the four quarters indicated Carcinogenic PAHs were below the MTCA Method A Cleanup levels.
- Monitoring well MW-9 was also sampled seven times between October 28, 2004 and February 1, 2007. Analytical results from the seven sampling events indicated that diesel was detected above the MTCA Method A cleanup level on three occasions. Four consecutive quarters of analytical results below the MTCA Method A cleanup levels were not achieved.
- Based on groundwater sampling activities in MW-11 which is hydraulically down gradient from MW-9, the low level groundwater contamination observed in MW-9 appears to be a localized issue only and does not appear to be migrating toward offsite locations.
- Based on the groundwater sampling activities that were conducted as part of this project between November 2004 and July 2005 in hydraulically down gradient locations (MW-10, 11, and 12) from the identified source areas (housing units 400 Mitchell Place, 324 Eichenberger Place, and 102 Armstrong Drive), it appears that contaminated groundwater has not migrated from the Geiger Heights Housing Area to any offsite location.

7.0 LIMITATIONS

The conclusions presented in this report are professional opinions based solely upon the data described in this report. They are intended exclusively for the purpose outlined herein and the site location and project indicated. This report is intended for the sole use of AFCEE. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings, conclusions, or recommendations presented herein is at sole risk of said user.

URS' objective is to perform our work with care, exercising the customary thoroughness and competence of earth science, environmental and engineering consulting professionals, in general accordance with the standard for professional services at the time and location those services are rendered. It should be recognized that this study was not intended to be a definitive investigation of contamination at the subject property and the recommendations provided are not necessarily inclusive of all the possible conditions. Given that the scope of services for this investigation was limited, and that variation between sampling points may exist, it is possible that the extent and



S:\public\bergeson\36298136 Geiger Heights Housing\Plots\Fig 1 Site Location Map.mxd

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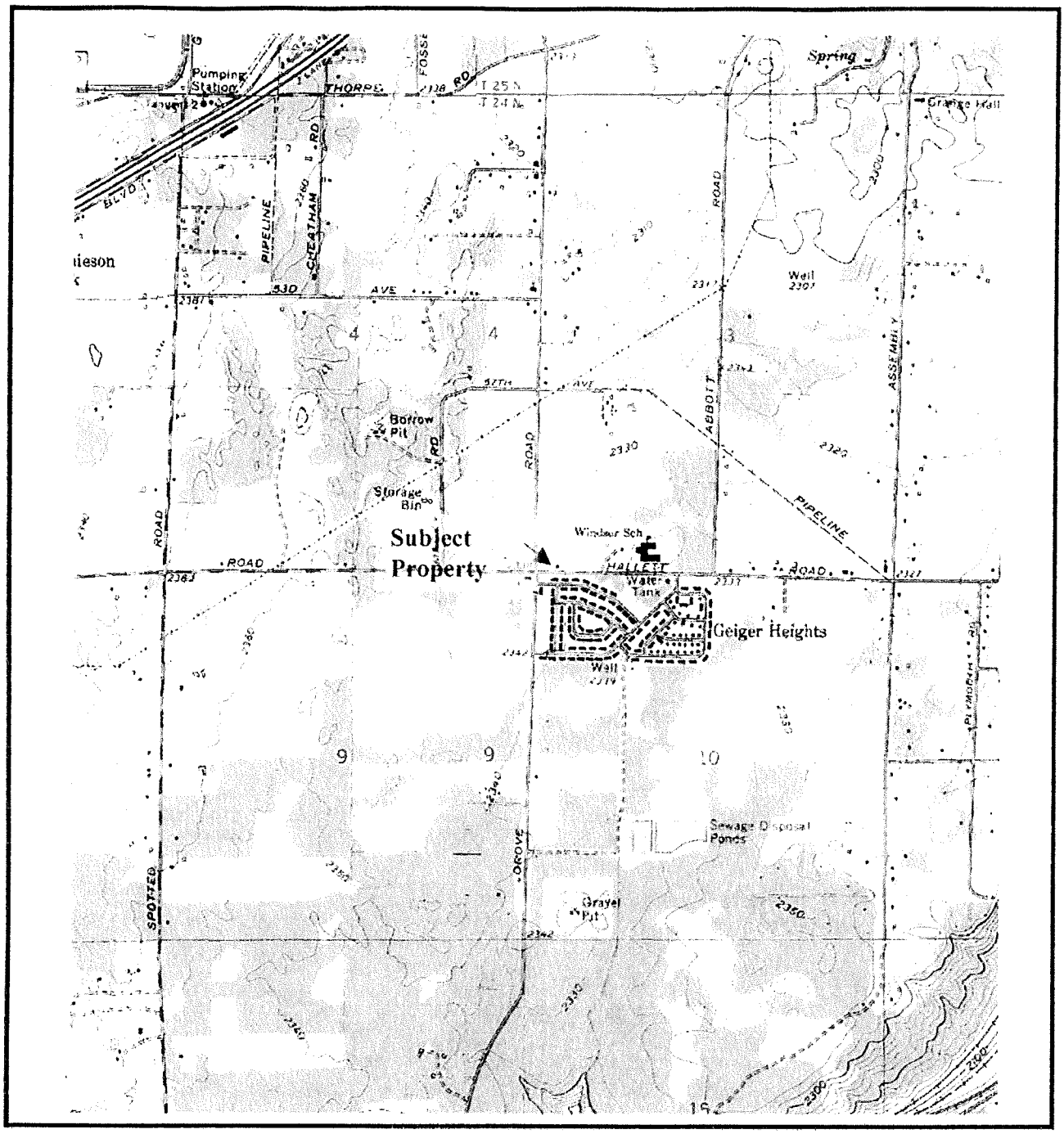
SITE LOCATION MAP

Geiger Heights Housing
Spokane, Washington
Contract FA 8903-04-D-8679, Task Order 0028

FIGURE 1



Spokane, SW, Washington Quadrangle USGS 7.5 Minute series, dated 1973, photorevised 1986. Scale 1:24,000.

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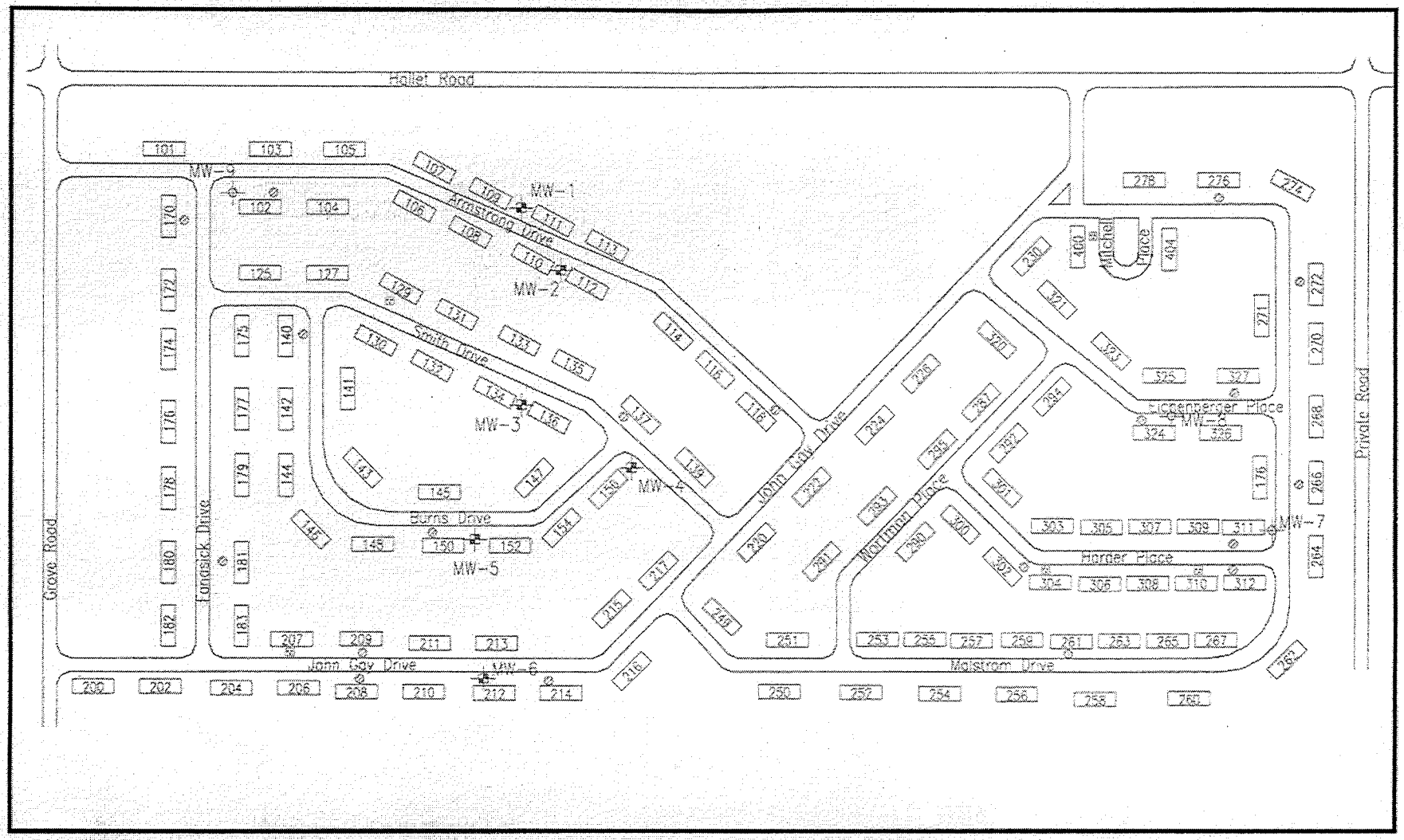
SITE TOPOGRAPHIC MAP

Geiger Heights Housing

Spokane, Washington

Contract FA 8903-04-D-8679, Task Order 0028

FIGURE 2



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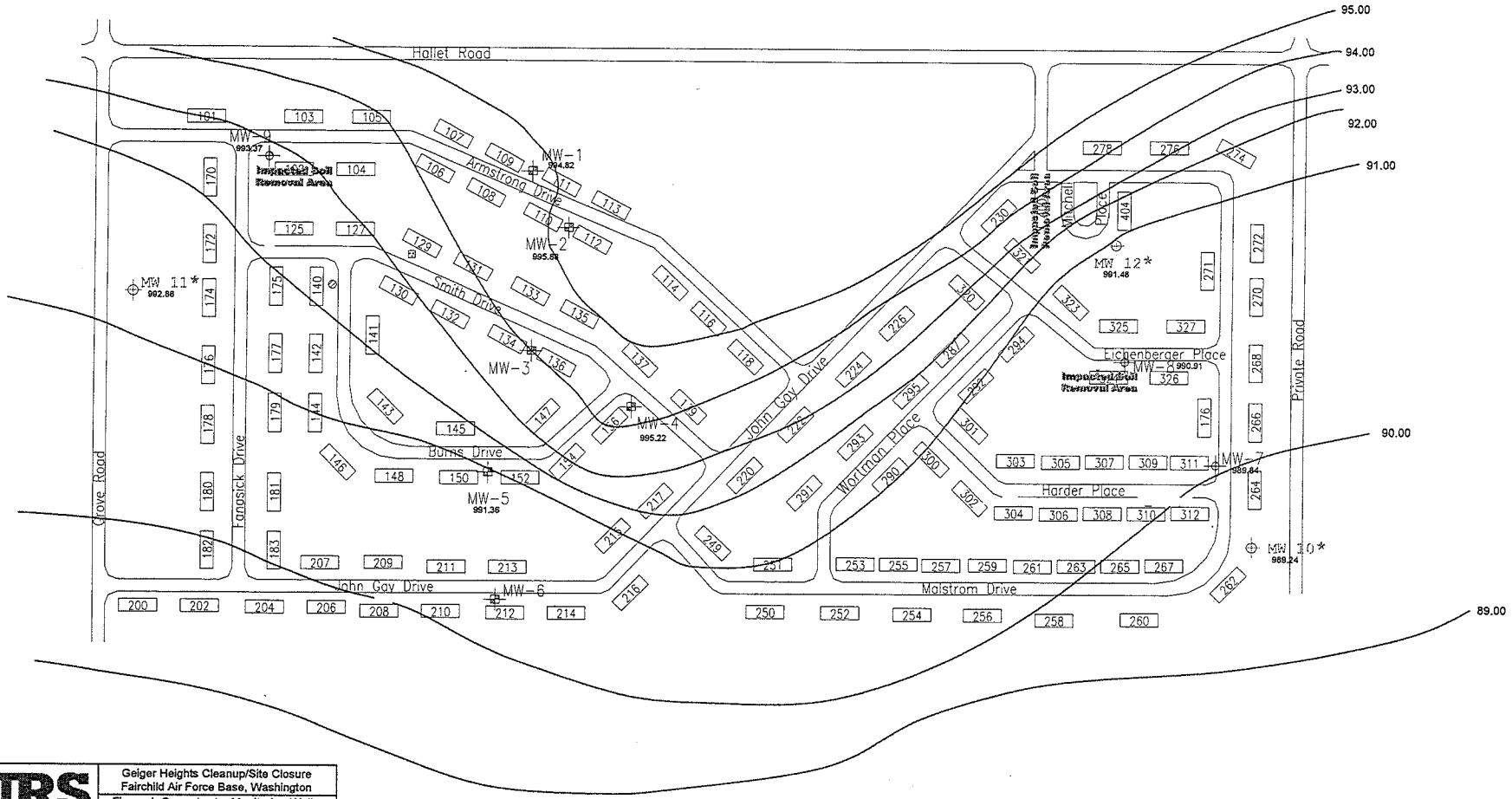
SITE PLAN

Geiger Heights Housing

Spokane, Washington

Contract FA 8903-04-D-8679, Task Order 0028

FIGURE 3



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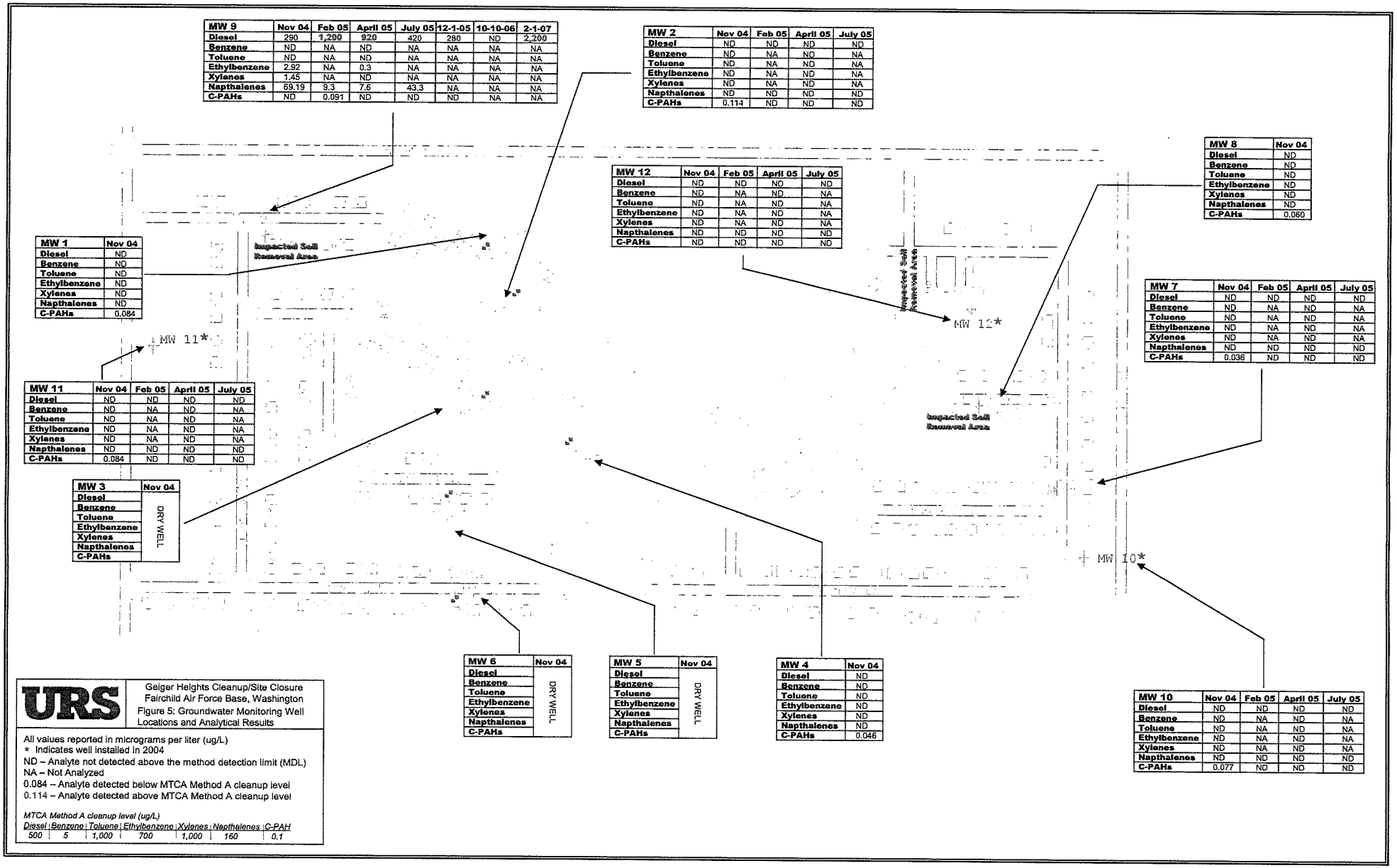
Geiger Heights Cleanup/Site Closure
Fairchild Air Force Base, Washington

Figure 4: Groundwater Monitoring Well Locations and Potentiometric Contours

—— Groundwater contour

* Indicates well installed in 2004



MW 9	Nov 04	Feb 05	April 05	July 05	12-1-05	10-10-06	2-1-07
Diesel	280	1,200	920	420	280	ND	2,200
Benzene	ND	NA	ND	NA	NA	NA	NA
Toluene	ND	NA	ND	NA	NA	NA	NA
Ethylbenzene	2.92	NA	0.3	NA	NA	NA	NA
Xylenes	1.45	NA	ND	NA	NA	NA	NA
Napthalenes	69.19	9.3	7.6	43.3	NA	NA	NA
C-PAHs	ND	0.091	ND	ND	ND	NA	NA

MW 2	Nov 04	Feb 05	April 05	July 05
Diesel	ND	ND	ND	ND
Benzene	ND	NA	ND	NA
Toluene	ND	NA	ND	NA
Ethylbenzene	ND	NA	ND	NA
Xylenes	ND	NA	ND	NA
Napthalenes	ND	ND	ND	ND
C-PAHs	0.114	ND	ND	ND

MW 12	Nov 04	Feb 05	April 05	July 05
Diesel	ND	ND	ND	ND
Benzene	ND	NA	ND	NA
Toluene	ND	NA	ND	NA
Ethylbenzene	ND	NA	ND	NA
Xylenes	ND	NA	ND	NA
Napthalenes	ND	ND	ND	ND
C-PAHs	ND	ND	ND	ND

MW 8	Nov 04
Diesel	ND
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Napthalenes	ND
C-PAHs	0.060

MW 1	Nov 04
Diesel	ND
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Napthalenes	ND
C-PAHs	0.084

MW 7	Nov 04	Feb 05	April 05	July 05
Diesel	ND	ND	ND	ND
Benzene	ND	NA	ND	NA
Toluene	ND	NA	ND	NA
Ethylbenzene	ND	NA	ND	NA
Xylenes	ND	NA	ND	NA
Napthalenes	ND	ND	ND	ND
C-PAHs	0.036	ND	ND	ND

MW 11	Nov 04	Feb 05	April 05	July 05
Diesel	ND	ND	ND	ND
Benzene	ND	NA	ND	NA
Toluene	ND	NA	ND	NA
Ethylbenzene	ND	NA	ND	NA
Xylenes	ND	NA	ND	NA
Napthalenes	ND	ND	ND	ND
C-PAHs	0.084	ND	ND	ND

MW 3	Nov 04
Diesel	DRY WELL
Benzene	
Toluene	
Ethylbenzene	
Xylenes	
Napthalenes	
C-PAHs	

MW 6	Nov 04
Diesel	DRY WELL
Benzene	
Toluene	
Ethylbenzene	
Xylenes	
Napthalenes	
C-PAHs	

MW 5	Nov 04
Diesel	DRY WELL
Benzene	
Toluene	
Ethylbenzene	
Xylenes	
Napthalenes	
C-PAHs	

MW 4	Nov 04
Diesel	ND
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
Napthalenes	ND
C-PAHs	0.046

MW 10	Nov 04	Feb 05	April 05	July 05
Diesel	ND	ND	ND	ND
Benzene	ND	NA	ND	NA
Toluene	ND	NA	ND	NA
Ethylbenzene	ND	NA	ND	NA
Xylenes	ND	NA	ND	NA
Napthalenes	ND	ND	ND	ND
C-PAHs	0.077	ND	ND	ND

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Geiger Heights Cleanup/Site Closure
Fairchild Air Force Base, Washington
Figure 5: Groundwater Monitoring Well Locations and Analytical Results

All values reported in micrograms per liter (ug/L)
* Indicates well installed in 2004
ND – Analyte not detected above the method detection limit (MDL)
NA – Not Analyzed
0.084 – Analyte detected below MTCA Method A cleanup level
0.114 – Analyte detected above MTCA Method A cleanup level

MTCA Method A cleanup level (ug/L)

Diesel	Benzene	Toluene	Ethylbenzene	Xylenes	Napthalenes	C-PAH
500	5	1,000	700	1,000	160	0.1

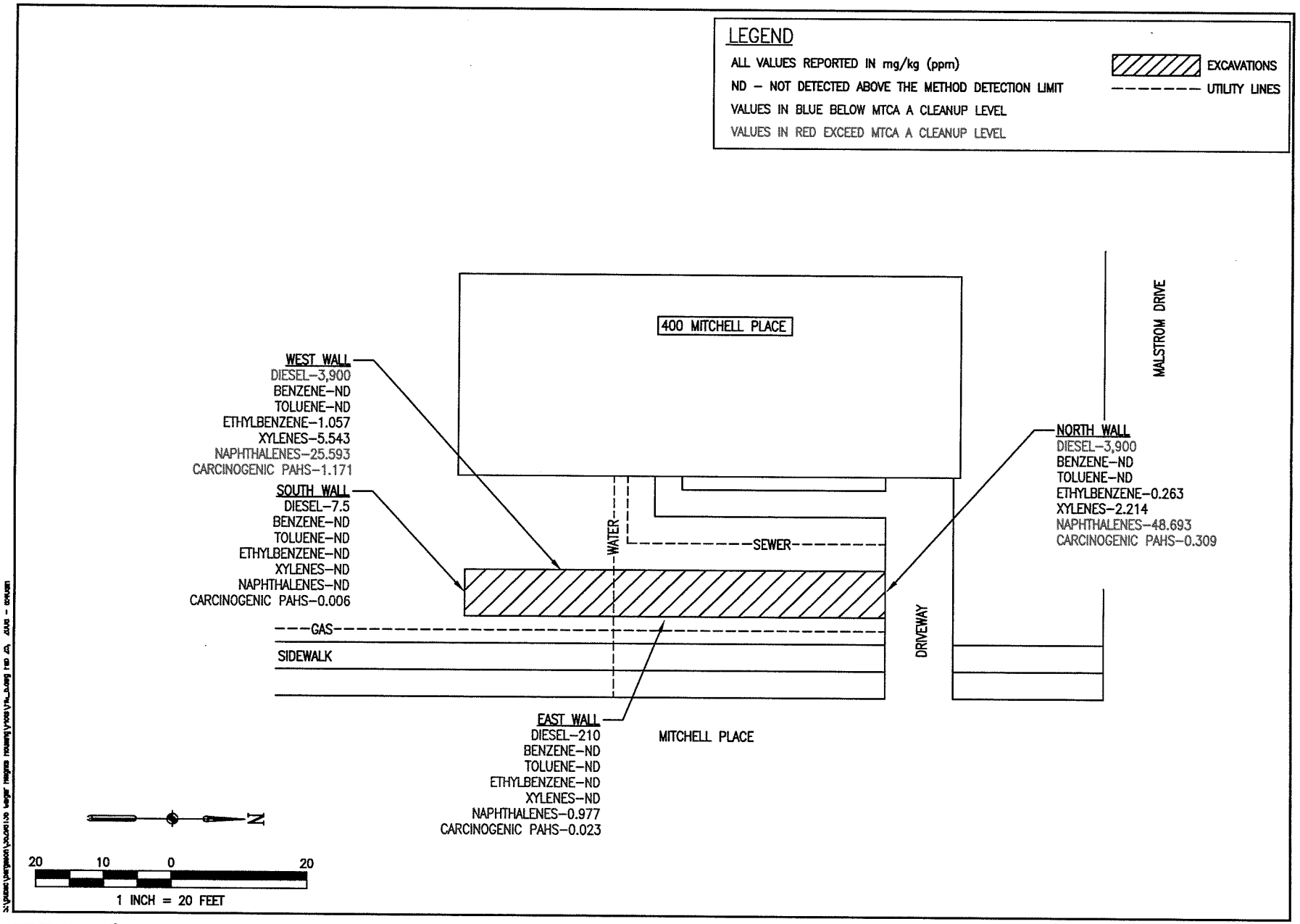

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Figure 6: Housing Unit 400 Phase 1 Excavation Location and Analytical Results

FAIRCHILD AIR FORCE BASE

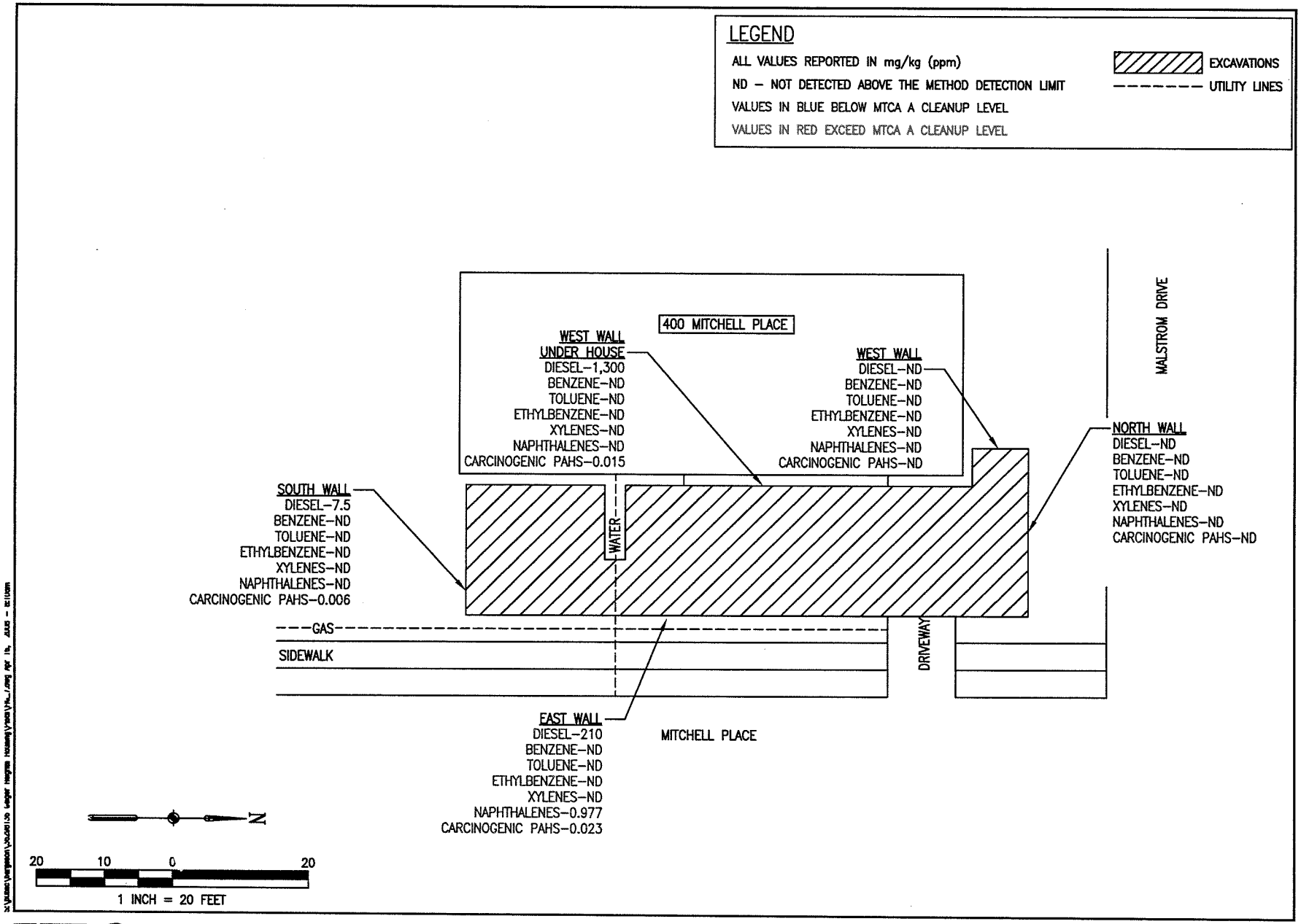

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Figure 7: Housing Unit 400 Phase II Confirmation Excavation Location and Analytical Resultsal Results

FAIRCHILD AIR FORCE BASE

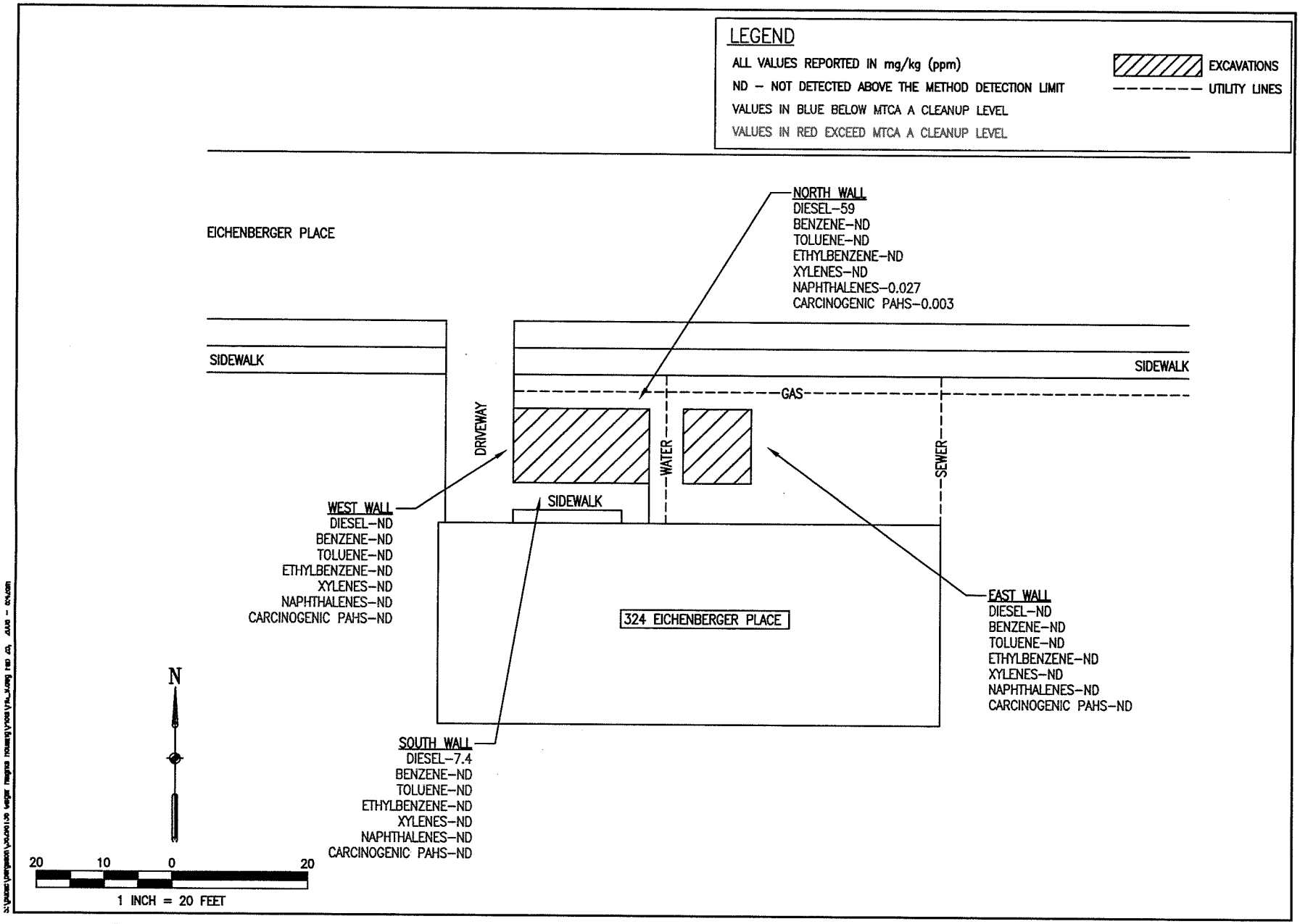

Figure 9: Housing Unit 324 Phase II Confirmation Excavation Location and Analytical Results

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FAIRCHILD AIR FORCE BASE

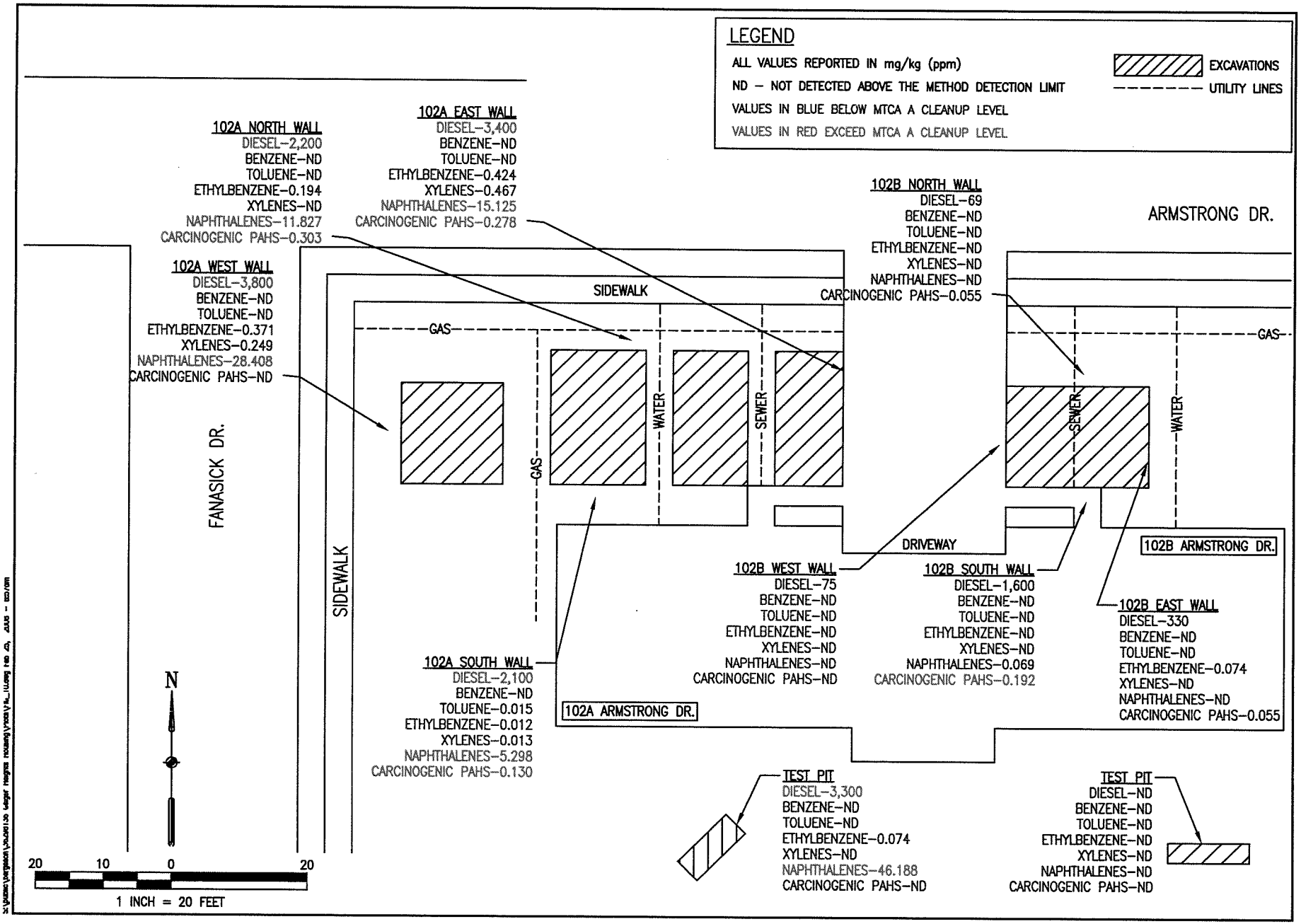

Figure 10: Housing Unit 102 Phase I Excavation Location and Analytical Results

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FAIRCHILD AIR FORCE BASE

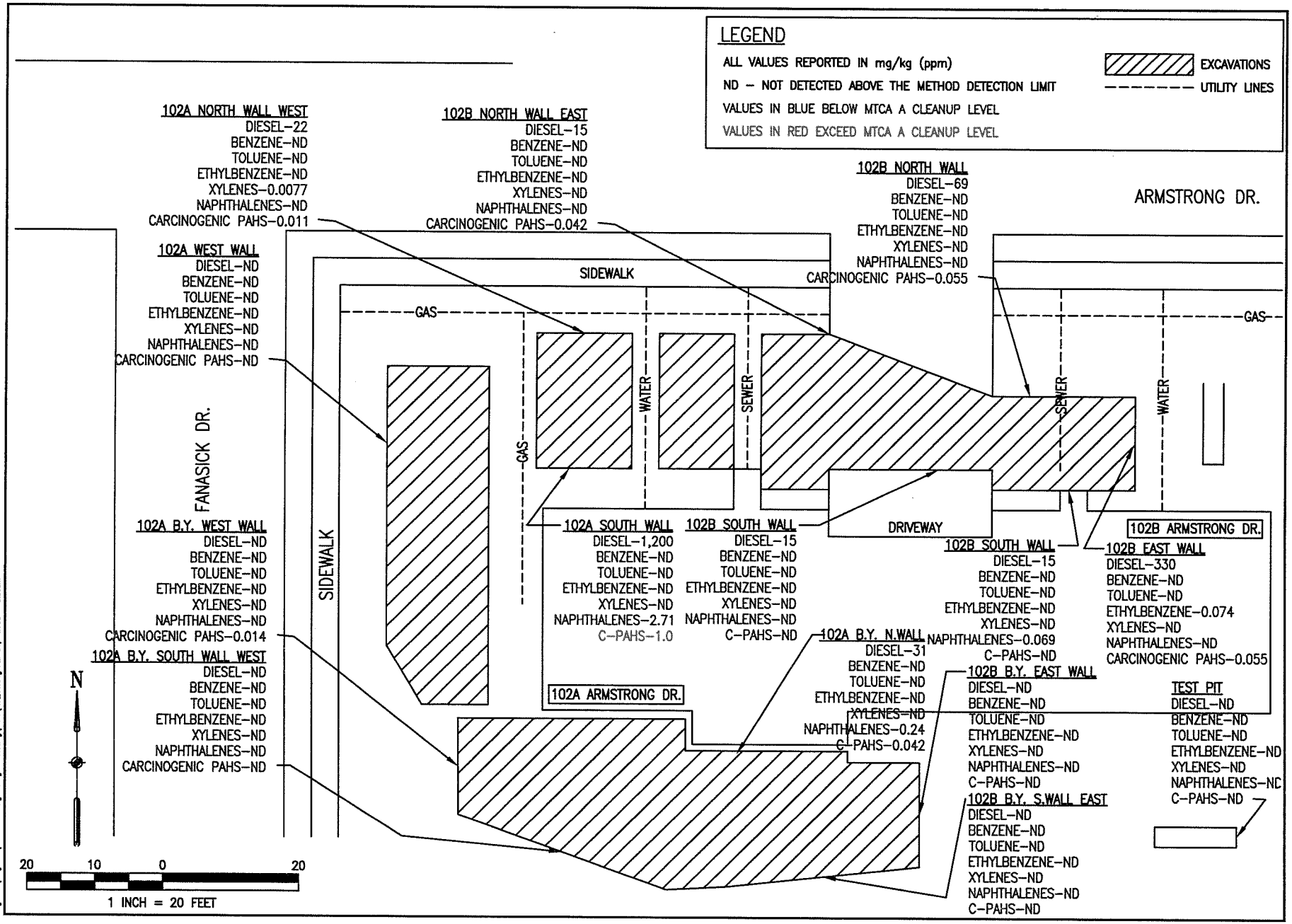

Figure 11: Housing Unit 102 Phase II Confirmation Excavation Location and Analytical Results

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FAIRCHILD AIR FORCE BASE

APPENDIX A
Groundwater Elevation Data

Depth to Water								
Monitoring Well		11/15/2005	2/7/2005	4/25/2005	7/19/2005	12/1/2005	10/10/2006	2/1/2007
MW-1		5.04	3.15	3.4	3.94			
MW-2		5.05	3.54	3.81	4.61	4.95		
MW-3		dry	2.51	2.98	4.43			
MW-4		5.58	3.37	4.24	5.07			
MW-5		9.24	5.86	8.86	8.83			
MW-6		dry	dry	7.78	8.46			
MW-7		3.54	3.18	3.12	3.56			
MW-8		3.78	3.44	3.4	3.96			
MW-9		4.24	3.56	3.29	4.02	4.43	5.44	3.95
MW-10		4.75	4.21	3.3	3.46			
MW-11		7.93	6.89	6.38	7.32			
MW-12		1.77	2.33	2.33	2.92			

Groundwater Elevation								
Monitoring Well		11/15/2005	2/7/2005	4/25/2005	7/19/2005	12/1/2005	10/10/2006	2/1/2007
MW-1	999.86	994.82	996.71	996.46	995.92			
MW-2	1000.9	995.88	997.39	997.12	996.32	995.98		
MW-3	1000.6	dry	998.09	997.62	996.17			
MW-4	1000.8	995.22	997.43	996.56	995.73			
MW-5	1000.6	991.36	994.74	991.74	991.77			
MW-6	999.58	dry	dry	991.8	991.12			
MW-7	993.38	989.84	990.2	990.26	989.82			
MW-8	994.69	990.91	991.25	991.29	990.73			
MW-9	997.61	993.37	994.05	994.32	993.59	993.18	992.17	993.66
MW-10	993.99	989.24	989.78	990.69	990.53			
MW-11	1000.8	992.86	993.9	994.41	993.47			
MW-12	993.25	991.48	990.92	990.92	990.33			

Survey Data		
Monitoring Well	Easting	Northing
MW-1	10276	9916.17
MW-2	10367	9752.59
MW-3	10327	9499.59
MW-4	10488	9379.27
MW-5	10203	9189.38
MW-6	10171	8929.65
MW-7	11788	9231.5
MW-8	11517	9439.38
MW-9	9662.1	9958.17
MW-10	11887	8980.18
MW-11	9398	9683.49
MW-12	11655	9703.81

APPENDIX B
Soil Boring Logs and Well Construction Details

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BORING LOG

Borehole ID: 10

Sheet 1 of 1

Location: Geiger Housing ~~Fairchild Air Force Base~~				
Project Name: Geiger Heights Cleanup	Project Number: 36249136	LTC CODE (IRPIMS)	Site ID: Geiger Heights	LPR CODE (IRPIMS)
Drilling Company: Env. West	Driller: Casey Baker	Ground Elevation	Total Drilled Depth: 9'	
Drilling Equipment: Mobile B-90	Drilling Method: HSA	Borehole Diameter: 8"	Date / Time Drilling Started: 11/12/04 0830	Date / Time Total Depth Reached: 11/12/04 0910
Type of Sampling Device: Split Spoon			Water Level (bgs): 4.75 ft	
Sample Hammer — Type: Kelly	Driving Wt.: 230#	Drop: 30"	Hydrogeologist	Checked By / Date
Location Description (include sketch in field logbook)				

Depth, feet	Interval	Recovery, in. driven / in. recovered	Blow Count, blows / ft	Description (Include lithology, grain size, sorting, angularity, Munsell color name and notation, minerology, bedding, plasticity, density, consistency, etc. as applicable)	USCS Code	Lithology	Water Content, %	Remarks (Include all sample types and depths, odor, organic vapor measurements, etc.)
0				Gravelly silty sand, dry, brown, subrounded to subangular gravel to 1".				
2				Grads to damp, increased clay				PID = 0.0 ppm GHH-MW10-0104
				2" sandy clay, light brown, damp,				
4				Clayey Silt, olive to dark brown, moist trace gravel, subangular to 2"				
				Grads to medium brown, wet, Cobbles to 6"				
6								
8				Fractured Basalt				
9				Refusal @ 9'				

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BORING LOG

Borehole ID: MW-11

Sheet 1 of 1

Location: Geiger Heights Housing ~~Fairchild Air Force Base~~					
Project Name: Geiger Heights Cleanup	Project Number: 36149136		LTC CODE (IRPIMS)	Site ID: Geiger Heights	LPR CODE (IRPIMS)
Drilling Company: Env. West	Driller: Casey Baker		Ground Elevation	Total Drilled Depth: 9.25'	
Drilling Equipment: Mobile B-90	Drilling Method: HSA	Borehole Diameter: 8"	Date / Time Drilling Started: 11/12/04 1115	Date / Time Total Depth Reached: 11/12/04 1140	
Type of Sampling Device: Split Spoon			Water Level (bgs): 8 ft		
Sample Hammer Type: Kelly	Driving Wt.: 130#	Drop: 30"	Hydrogeologist	Checked By / Date	
Location Description (include sketch in field logbook)					

Depth, feet	Interval	Recovery, in. driven / in. recovered	Blow Count, blows / ft	Description (Include lithology, grain size, sorting, angularity, Munsell color name and notation, minerology, bedding, plasticity, density, consistency, etc. as applicable)	USCS Code	Lithology	Water Content, %	Remarks (Include all sample types and depths, odor, organic vapor measurements, etc.)
0				fine Sands, trace silt, dry light brown				
2								
4				Grades with increased silt				
6		10"	34 48 50/3	Silty sandy gravel, light brown, damp. rounded gravel to 1"				PID = 0.0 ppm GHH-MW11-0116
8				Sandy gravel, coarse sand, subangular basalt gravel to 2", wet				
9				Fractured basalt Refusal @ 9.25'				

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BORING LOG

Borehole ID: MW-12

Sheet 1 of 1

Project Name: Geiger Heights Cleanup	Project Number: JG29713G	LTC CODE (IRPIMS)	Location: Geiger Heights Housing ~~Fairchild Air Force Base~~ Site ID	LPR CODE (IRPIMS)
Drilling Company: Env. West	Driller: Casey Baker	Ground Elevation	Total Drilled Depth: 6.3'	
Drilling Equipment: Mobile B-90	Drilling Method: HSA	Borehole Diameter: 8"	Date / Time Drilling Started: 11/12/04 1250	Date / Time Total Depth Reached: 11/12/04 1315
Type of Sampling Device: Split Spoon			Water Level (bgs): 2 ft	
Sample Hammer Type: Kelly	Driving Wt.: 130#	Drop: 30"	Hydrogeologist	Checked By / Date
Location Description (include sketch in field logbook)				

Depth, feet	Interval	Recovery, in. driven / in. recovered	Blow Count, blows / ft	Description (Include lithology, grain size, sorting, angularity, Munsell color name and notation, minerology, bedding, plasticity, density, consistency, etc. as applicable)	USCS Code	Lithology	Water Content, %	Remarks (Include all sample types and depths, odor, organic vapor measurements, etc.)
0				Sandy Silt, medium brown, damp, trace rounded to subrounded basalt gravel to 2"				
				Grades to moist				
2				Grades to wet. ▼				
		16"	4 9 7 11					PID = 0.0 ppm GHH - MW12 - 0124
4				Grads with increased basalt gravel				
				Fractured Basalt				
6				Refusal @ 6.3'				
8								

AFCEE_1 P:\36ADCB-1\2004\BORINGS\2004FT-2.GPJ URSSEA3.GLB AFCEE.GDT 4/29/04 Spokane Washington

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Steve Demus /Mike Hermanson

DRILLING CONTRACTOR: Environmental West Exploration

DRILLING TECHNIQUE: Auger
AUGER SIZE AND TYPE: 8"

BOREHOLE IDENTIFICATION: MW 10
BOREHOLE DIAMETER: 6"
WELL IDENTIFICATION : MW 10
WELL CONSTRUCTION START DATE: 11/12/04
WELL CONSTRUCTION COMPLETE DATE: 11/12/04

SCREEN MATERIAL: Schedule 40 PVC/ 0.01" slot
SCREEN DIAMETER: 2"
STRATUM-SCREENED INTERVAL (FT): 3.5' - 8.5'

CASING MATERIAL: Schedule 40 PVC
CASING DIAMETER: 2"

TYPE OF FILTER PACK: Silica Sand
GRADIATION: 10/20
AMOUNT OF FILTER PACK USED: 5 (50lb) bags

TYPE OF BENTONITE: 3/8" Hole Plug
AMOUNT BENTONITE USED: 3 (50lb) bags

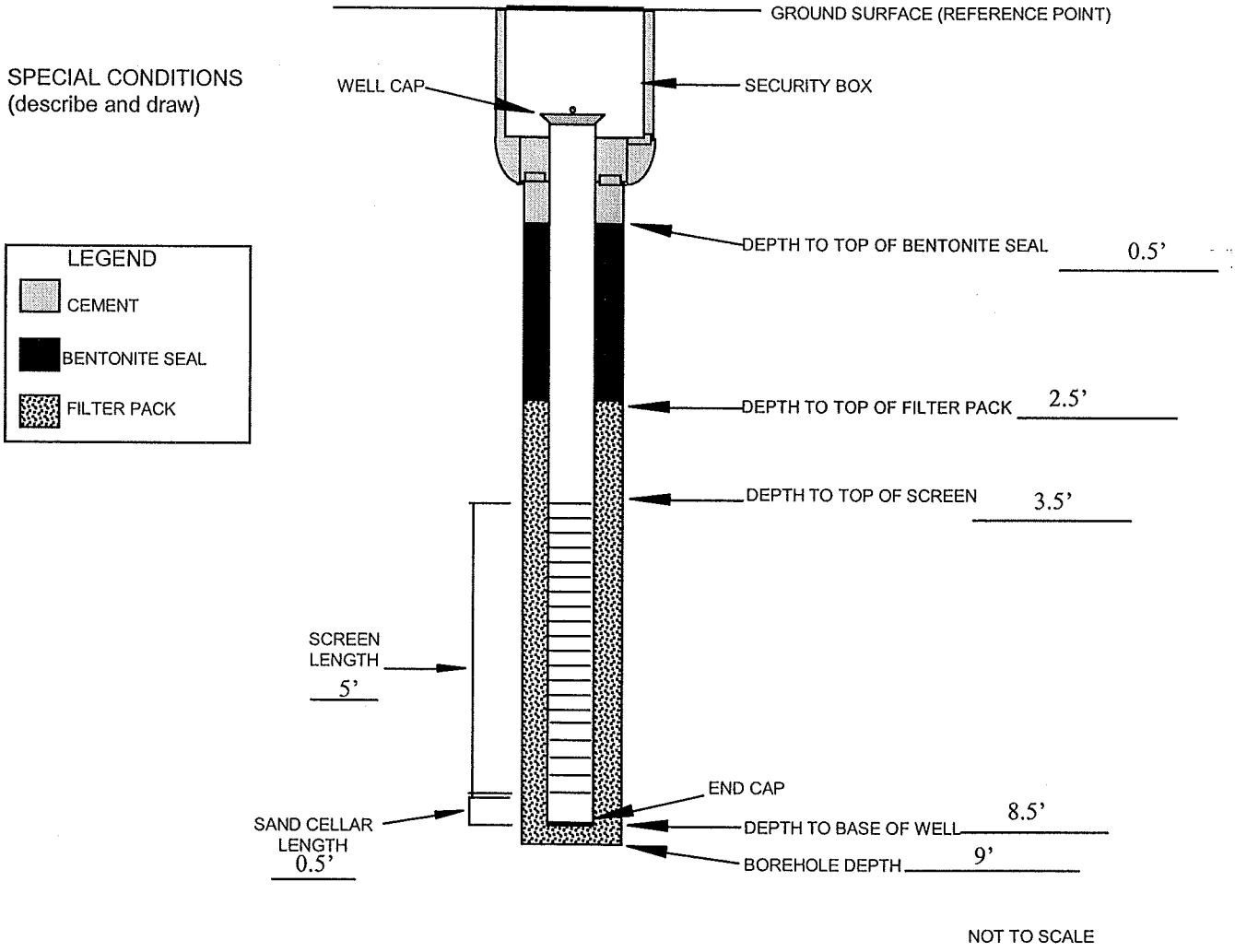
TYPE OF CEMENT: Concrete Mix
AMOUNT CEMENT USED: 4 (80lb) bags
GROUT MATERIALS USED: none

DIMENSIONS OF SECURITY BOX: 8"

TYPE OF WELL CAP: Locked
TYPE OF END CAP: Threaded

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Environmental West Exploration INSTALLATION OBSERVED BY: Steve Demus / Kathy Kees
DISCREPANCIES: None

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Steve Demus /Mike Hermanson

DRILLING CONTRACTOR: Environmental West Exploration

DRILLING TECHNIQUE: Auger
AUGER SIZE AND TYPE: 8"

BOREHOLE IDENTIFICATION: MW 11
BOREHOLE DIAMETER: 6"
WELL IDENTIFICATION : MW 11
WELL CONSTRUCTION START DATE: 11/12/04
WELL CONSTRUCTION COMPLETE DATE: 11/12/04

SCREEN MATERIAL: Schedule 40 PVC/ 0.01" slot
SCREEN DIAMETER: 2"
STRATUM-SCREENED INTERVAL (FT): 3.5' - 8.5'

CASING MATERIAL: Schedule 40 PVC
CASING DIAMETER: 2"

TYPE OF FILTER PACK: Silica Sand
GRADIATION: 10/20
AMOUNT OF FILTER PACK USED: 5 (50lb) bags

TYPE OF BENTONITE: 3/8" Hole Plug
AMOUNT BENTONITE USED: 3 (50lb) bags

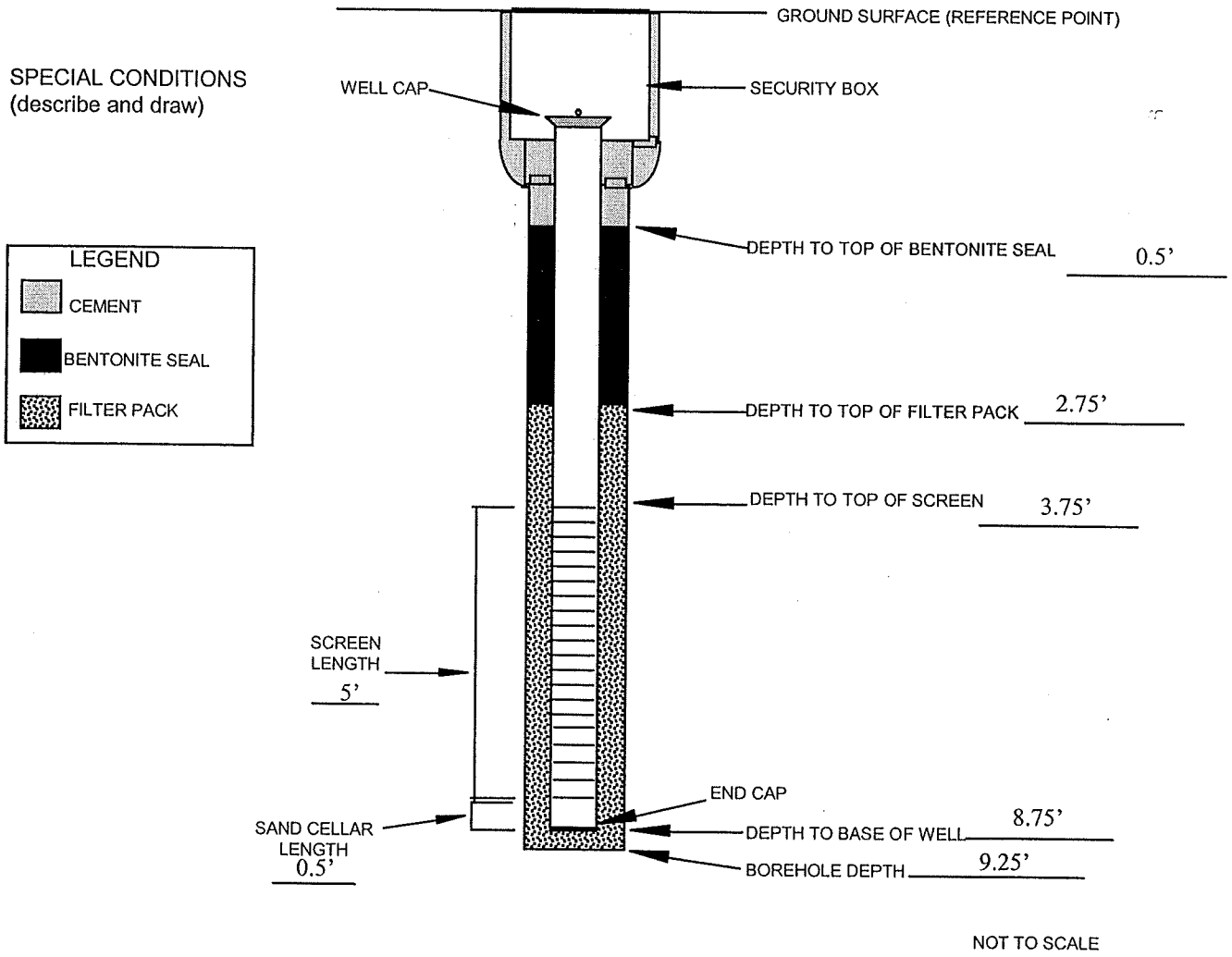
TYPE OF CEMENT: Concrete Mix
AMOUNT CEMENT USED: 4 (80lb) bags
GROUT MATERIALS USED: none

DIMENSIONS OF SECURITY BOX: 8"

TYPE OF WELL CAP: Locked
TYPE OF END CAP: Threaded

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Environmental West Exploration INSTALLATION OBSERVED BY: Steve Demus / Mike Hermanson
DISCREPANCIES: None

WELL CONSTRUCTION DETAILS AND ABANDONMENT FORM

FIELD REPRESENTATIVE: Steve Demus /Mike Hermanson

DRILLING CONTRACTOR: Environmental West Exploration

DRILLING TECHNIQUE: Auger
AUGER SIZE AND TYPE: 8"

BOREHOLE IDENTIFICATION: MW 12
BOREHOLE DIAMETER: 6"
WELL IDENTIFICATION : MW 12
WELL CONSTRUCTION START DATE: 11/12/04
WELL CONSTRUCTION COMPLETE DATE: 11/12/04

SCREEN MATERIAL: Schedule 40 PVC/ 0.01" slot
SCREEN DIAMETER: 2"
STRATUM-SCREENED INTERVAL (FT): 3.75' - 5.75'

CASING MATERIAL: Schedule 40 PVC
CASING DIAMETER: 2"

TYPE OF FILTER PACK: Silica Sand
GRADIATION: 10/20
AMOUNT OF FILTER PACK USED: 5 (50lb) bags

TYPE OF BENTONITE: 3/8" Hole Plug
AMOUNT BENTONITE USED: 2 (50lb) bags

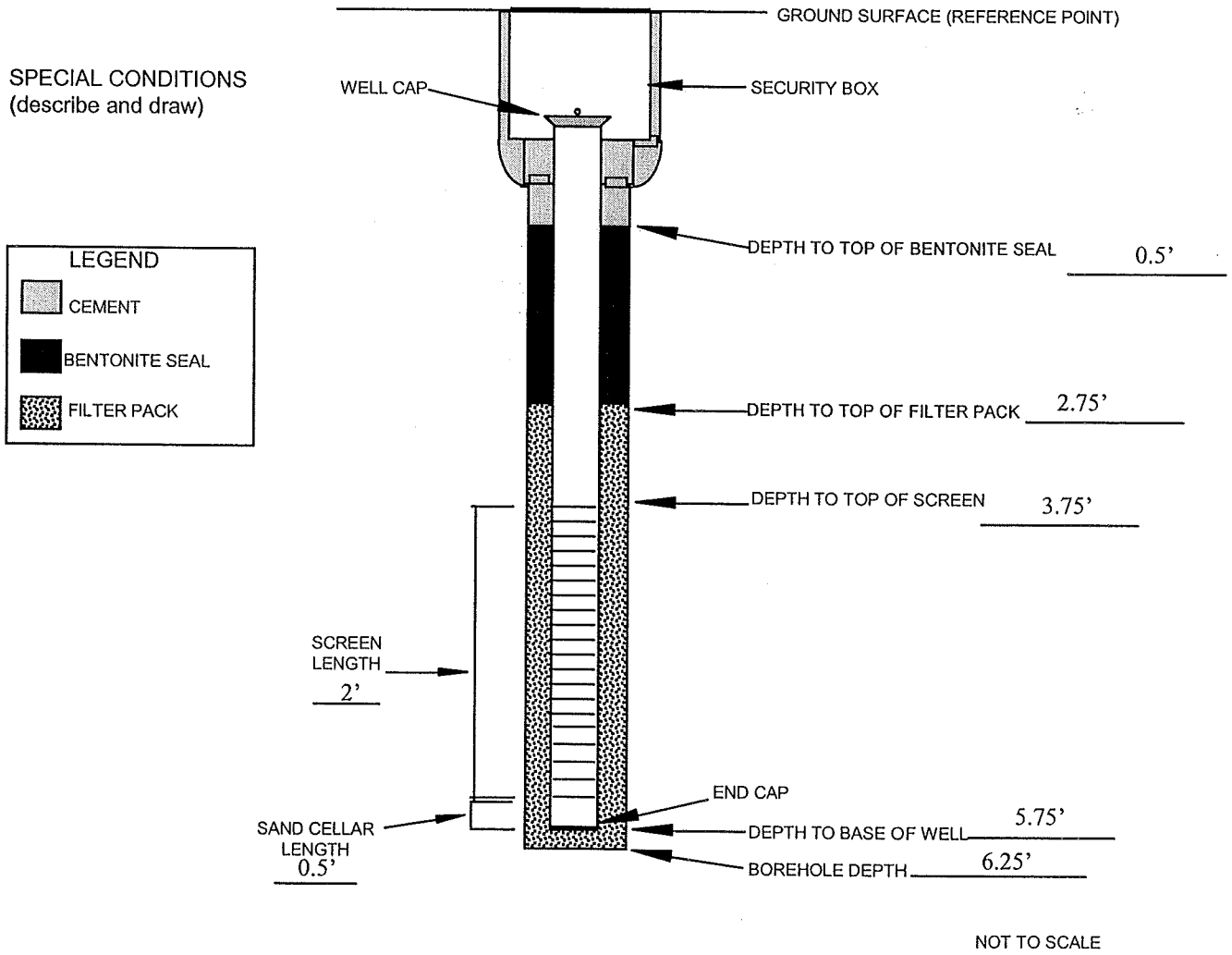
TYPE OF CEMENT: Concrete Mix
AMOUNT CEMENT USED: 3 (80lb) bags
GROUT MATERIALS USED: none

DIMENSIONS OF SECURITY BOX: 8"

TYPE OF WELL CAP: Locked
TYPE OF END CAP: Threaded

COMMENTS:

SPECIAL CONDITIONS
(describe and draw)



NOT TO SCALE

INSTALLED BY: Environmental West Exploration INSTALLATION OBSERVED BY: Steve Demus / Mike Hermanson
DISCREPANCIES: None

APPENDIX C
Tables 5-1 Groundwater Sampling Results and 5-2 Soil Sampling Results

Fairchild Airforce Base Geiger Heights Housing Site Cleanup and Closure

Table 5-1: Groundwater Sample Analytical Results

Parameter	Method A Cleanup Levels[1]	1st Quarter									QAQC	2nd Quarter							QAQC
		GHH-MW1-001	GHH-MW2-001	GHH-MW4-001	GHH-MW7-001	GHH-MW8-001	GHH-MW9-001	GHH-MW10-001	GHH-MW11-001	GHH-MW12-001	GHH-MW9-501	GHH-MW2-002	GHH-MW7-002	GHH-MW9-002	GHH-MW10-002	GHH-MW11-002	GHH-MW12-002	GHH-MW2-502
Sample Location		MW 1	MW 2	MW 4	MW 7	MW 8	MW 9	MW 10	MW 11	MW 12	MW 9	MW 2	MW 7	MW 9	MW 10	MW 11	MW 12	MW 2
Sampling Date		10/28/2004	10/28/2004	10/28/2004	10/28/2004	10/28/2004	10/28/2004	10/28/2004	10/28/2004	10/28/2004	10/28/2004	2/3/2005	2/3/2005	2/3/2005	2/3/2005	2/3/2005	2/3/2005	2/3/2005
Diesel[2]	500	<250	<250	<250	<250	<250	<250	<250	<250	<250	**290**	<250	<250	**1200**	<250	<250	<250	<250
Motor Oil	500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Benzene	5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	-	-	-	-	-	-
Ethylbenzene	700	<0.16	<0.16	<0.16	<0.16	<0.16	**2.92**	<0.16	<0.16	<0.16	**2.92**	-	-	-	-	-	-	-
Xylenes	1000	<0.32	<0.32	<0.32	<0.32	<0.32	**1.45-F**	<0.32	<0.32	<0.32	**1.6-F**	-	-	-	-	-	-	-
Toluene	1000	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	-	-	-	-	-	-	-
Naphthalene	-	<0.11	<0.11	<0.11	<0.11	<0.11	**8.86**	<0.11	<0.11	<0.11	**10.52**	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
1-methylnaphthalene	-	<0.12	<0.12	<0.12	<0.12	<0.12	**50.88**	<0.12	<0.12	<0.12	**66.43**	<0.47	<0.47	**9.3**	<0.47	<0.47	<0.47	<0.47
2-methylnaphthalene	-	<0.08	<0.08	<0.08	<0.08	<0.08	**9.45-J**[4]	<0.08	<0.08	<0.08	**17.49-J**	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47
Total naphthalenes	*160*	-	-	-	-	-	***69.19***	-	-	-	***94.44***	-	-	***9.3***	-	-	-	-
Benzo(a)anthracene	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.003	<0.003	<0.003	<0.004	<0.047	<0.047	**0.091-F**	<0.047	<0.047	<0.047	<0.047
Benzo(a)pyrene	-	<0.025	**0.065-F**[3]	<0.025	<0.025	<0.025	<0.025	<0.024	<0.024	<0.024	<0.025	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047
Benzo(b)fluoranthene	-	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	**0.077-F**	**0.057-F**	<0.028	<0.028	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
Benzo(k)fluoranthene	-	<0.009	**0.029-F**	**0.019-F**	<0.009	**0.018-F**	<0.009	<0.009	**0.027-F**	<0.009	<0.009	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047
Chrysene	-	<0.017	**0.020-F**	**0.027-F**	**0.036-F**	**0.042-F**	<0.017	<0.017	<0.017	<0.017	<0.017	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047
Dibenzo(a,h)anthracene	-	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
Indeo(1,2,3-cd)pyrene	-	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.079	<0.079	<0.079	<0.080	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047
Total Carcinogenic PAHs[5]	*0.1*	-	***0.114***	***0.046***	***0.036***	***0.06***	-	***0.077***	***0.084***	-	-	-	-	***0.091***	-	-	-	-
Acenaphthylene	NE[6]	<0.26	<0.26	<0.26	<0.26	<0.26	**3.22-J**	<0.26	<0.26	<0.26	**4.08-J**	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047
Acenaphthene	NE	<0.14	<0.14	<0.14	<0.14	<0.14	2.5	<0.14	<0.14	<0.14	2.34	<0.047	<0.047	**6.3**	<0.047	<0.047	<0.047	<0.047
Fluorene	NE	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	3.98	<0.094	<0.094	**2.3**	<0.094	<0.094	<0.094	<0.094
Phenanthrene	NE	<0.04	<0.04	<0.04	<0.04	<0.04	**1.63-J**	<0.04	<0.04	<0.04	**2.89-J**	<0.047	<0.047	**1.5**	<0.047	<0.047	<0.047	<0.047
Anthracene	NE	<0.01	<0.01	<0.01	<0.01	<0.01	**0.54-F**	<0.01	<0.01	<0.01	**0.63-F**	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047
Fluoranthene	NE	<0.04	<0.04	<0.04	**<0.04**	<0.04	1.38-J	<0.04	<0.04	<0.04	**1.69-J**	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
Pyrene	NE	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094
Benzo(g,h,I)perylene	NE	<0.169	<0.169	<0.169	<0.169	<0.169	<0.167	<0.167	<0.167	<0.167	<0.167	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047

Parameter	MTCA Method A Cleanup Levels	3rd Quarter						QAQC	3rd Quarter						QAQC	4th Quarter		QAQC	4th Quarter	QA/QC	1st Quarter	QA/QC
		GHH-MW2-GW03	GHH-MW7-GW03	GHH-MW9-GW03	GHH-MW10-GW03	GHH-MW11-GW03	GHH-MW12-GW03	GHH-MW7-GW53	GHH-MW2-GW04	GHH-MW7-GW04RE	GHH-MW9-GW04RE	GHH-MW10-GW04	GHH-MW11-GW04	GHH-MW12-GW04	GHH-MW9-GW54RE	GHH-MW2-05	GHH-MW9-OF	GHH-MW2-05	GHH-MW9-OF	GHH-MW9-06	GHH-MW9-56	GHH-MW9-07	GHH-MW9-57
Sample Location		MW 2	MW 7	MW 9	MW 10	MW 11	MW 12	MW 7	MW 2	MW 7	MW 9	MW 10	MW 11	MW 12	MW 9	MW 2	MW 9	MW 2	MW 9	MW 9	MW 9	MW 9	MW 9
Sampling Date		4/25/2005	4/25/2005	4/25/2005	4/25/2005	4/25/2005	4/25/2005	4/25/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	12/1/2005	12/1/2005	12/1/2005	12/1/2005	10/10/2006	10/10/2006	2/1/2007	2/1/2007
Diesel	500	<250	<250	**920**	<250	<250	<250	<250	<250	<250	**420**	<250	<250	<250	**390**	-	280	-	280	<250	<250	**2200**	**2100**
Motor Oil	500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	-	<500	-	<500	<500	<500	-	-
Benzene	5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	700	<0.2	<0.2	**0.3-F**	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes	1000	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	1000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	**7.4-J**	<0.47	<0.47	<0.47	**7.1-J**	<0.47	-	<0.47	-	-	-	-	-
1-methylnaphthalene	-	<0.47	<0.47	**4**	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	**30-J**	<0.47	<0.47	<0.47	**29-J**	<0.47	-	<0.47	-	-	-	-	-
2-methylnaphthalene	-	<0.47	<0.47	**3.6**	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	**5.9-J**	<0.47	<0.47	<0.47	**5.6-J**	<0.47	-	<0.47	-	-	-	-	-
Total naphthalenes	*160*	-	-	**7.6**	-	-	-	-	-	-	**43.3**	-	-	-	**41.7**	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	-	<0.047	-	-	-	-	-
Benzo(a)pyrene	-	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	-	<0.047	-	-	-	-	-
Benzo(b)fluoranthene	-	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	-	<0.094	-	-	-	-	-
Benzo(k)fluoranthene	-	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	-	<0.047	-	-	-	-	-
Chrysene	-	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	-	<0.047	-	-	-	-	-
Dibenzo(a,h)anthracene	-	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	-	<0.094	-	-	-	-	-
Indeo(1,2,3-cd)pyrene	-	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	-	<0.047	-	-	-	-	-
Total Carcinogenic PAHs	*0.1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	NE	<0.47	<0.47	**5.5**	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	**3.3-J**	<0.47	<0.47	<0.47	**3.5-J**	<0.47	-	<0.47	-	-	-	-	-
Acenaphthylene	NE	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	<0.47	-	<0.47	-	-	-	-	-
Fluorene	NE	<0.094	<0.094	**1.5-F**	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	**2**	<0.094	<0.094	<0.094	**2.2**	<0.094	-	<0.094	-	-	-	-	-
Phenanthrene	NE	<0.047	<0.047	**0.78-F**	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	**2.5-J**	<0.047	<0.047	<0.047	**2.5-J**	<0.047	-	<0.047	-	-	-	-	-
Anthracene	NE	<0.047	<0.047	**0.17-F**	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	**0.37-J**	<0.047	<0.047	<0.047	**0.38-J**	<0.047	-	<0.047	-	-	-	-	-
Fluoranthene	NE	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	-	<0.094	-	-	-	-	-
Pyrene	NE	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	<0.094	-	<0.094	-	-	-	-	-
Benzo(g,h,I)perylene	NE	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	<0.047	-	<0.047	-	-	-	-	-

1 Method A values are from Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC, WDOE Publication #94-06 Revised January 2003.
2 Results given in ug/L
3 AFCEE flag indicating the analyte was positivley identified, but the associated numerical value is below the reporting limit.
4 AFCEE flag indicating the analyte was positively identified, but the quantitation is an estimation.
5 Carcinogenic PAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeo(1,2,3-cd)pyrene
Note: Bolded numbers indicate detections above the method detection limit but below cleanup levels. Bolded and highlighted numbers indicate detections exceeding cleanup levels.
6 NE- Not Established.

Fairchild Airforce Base Geiger Heights Housing Site Cleanup and Closure

Table 5-2: Soil Sample Analytical Results

Analytical Results - Phase I Excavation Confirmation Soil Sampling

Parameter	Method A Cleanup Levels[1]	400 Mitchell						324 Eichenberger						102A Armstrong					102B Armstrong							QA/QC	
		GHH-400-SCR	GHH-400-STOCK	GHH-400-NORTH	GHH-400-SOUTH	GHH-400-EAST	GHH-400-WEST	GHH-324-SCR	GHH-324-STOCK	GHH-324-NORTH	GHH-324-SOUTH	GHH-324-EAST	GHH-324-WEST	GHH-102A-NORTH	GHH-102A-SOUTH	GHH-102A-EAST	GHH-102A-WEST	GHH-102A-TP	GHH-102-SCR	GHH-102B-STOCK	GHH-102B-NORTH	GHH-102B-SOUTH	GHH-102B-EAST	GHH-102B-WEST	GHH-102B-TP	GHH-102B-2TP[10]	GHH-324-5SCR
Sample Location		Screening	Backfill	North Wall	South Wall	East Wall	West Wall	Screening	Backfill	North Wall	South Wall	East Wall	West Wall	North Wall	South Wall	East Wall	West Wall	Test Pit	Screening	Backfill	North Wall	South Wall	East Wall	West Wall	Test Pit	Rinsate Blank	Field Duplicate
Sampling Date		12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/2/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/8/2004	12/2/2004
Diesel[2]	2000	3600	<5.0	3700	7.5	210	3900	3100	39	59	1000	<5.0	310	2200	2100	3400	3800	3300	2000	5.4	69	1600	75	290	<5.0	<0.25	3300
Motor Oil	2000	110	<10	130	16	12	130	<200	18	11	40	<10	27	<100	<100	<200	<200	<200	<100	<10	<10	<100	<10	22	<10	<0.50	<200
Benzene[3]	30	<26.5	<1.10	<26.0	<1.29	<24.0	<24.7	<1.40	<0.89	<1.18	<21.8	<0.94	<19.4	<22.1	<1.0	<0.93	<0.90	<21.9	<22.2	<0.80	<0.98	<0.92	<0.93	<0.86	<0.81	<0.10	<1.18
Ethylbenzene	6000	2679.8	<0.84	263.5-F[4]	<0.98	<28.3	1056.8	<1.06	<0.68	<0.90	<25.7	<0.72	<22.9	194.2-F	11.82	424.08-J	593.01-J	74.6-F	461.3-F	<0.35	<0.43	<0.41	<0.41	<0.38	<0.36	<0.16	<0.90
Xylenes	9000	13889.4	<2.02	2213.6	<2.37	<267.0	5542.7	<2.56	<1.63	<2.16	<242.2	<1.73	<215.5	<246.0	13.36	467.45-J	518.28-J	<243.2	1292	<2.48	<3.05	<2.86	<2.86	<2.66	<2.53	<0.32	<2.17
Toluene	7000	<122.3	<0.99	<120.1	<1.16	<110.9	<114.3	<1.25	<0.80	<1.06	<100.6	<0.84	<89.5	<102.2	15.66	<1.05	<1.01	<101.0	<102.4	<0.90	<1.10	<1.03	<1.04	<0.96	<0.91	<0.12	<1.06
Naphthalene	-	<8.4	7131.7-M[5]	4361.2-M	<8.3-M	44.9-M	2396.8-M	<8.7-R	<8.6-M	<8.3-M	<8.1-M	<8.2-R	<8.5-M	2041.8-M	717.4-M	2343.9-M	3901.9-M	3454.8-M	3874.1-M	<8.9-R	<9.4-R	69.4-M	<9.8-R	<9.4-M	<9.3-R	<0.11-R	<8.6-R
1-methylnaphthalene	-	<4.8-R[6]	52920.7-M	29150.6-M	<4.7-R	751.5-M	15746.5-M	<49.9-R	<4.9-M	27.3-M	797.3-M	<4.7-R	190.8-M	5241.3	2565.5	7158.6	15405.2	24002.3	11286.4-J	<5.1	<5.4	<5.6	<5.6	<5.4	<5.3	<0.12-R	2560.0-M
2-methylnaphthalene	-	<4.7-R	23642.7-M	15181.7-M	<4.6-R	180.4-M	7449.8-M	<4.8-R	<4.8-M	<4.6-M	<45.0-M	<4.6-R	<4.7-M	4543.5	2014.6	5622.1	9101.2	15968.4	7905.9-J	<4.9	<5.2	<5.4	<5.4	<5.2	<5.1	<0.08-R	<4.8-R
Total naphthalenes	*5000*	-	*83695.1*	*48693.5*	-	*976.8*	*26593.1*	-	-	*27.3*	*797.3*	-	*190.8*	*11826.0*	*5297.5*	*15124.6*	*28408.3*	*43425.5*	*23066.4*	-	-	*69.4*	-	-	-	-	*2560*
Benzo(a)anthracene	-	<0.6	891.6-M	296.5-M	6.0-M	22.7-M	161.3-M	<0.6-R	1.8-M	2.6-M	238.0-M	<0.6-R	48.4-M	202.5-M	124.6-M	278.3-M	<0.7-M	<0.7-R	<0.7-M	<0.7	17.0-M	179.0-M	4.8-M	<0.7-M	<0.7-M	<0.004-R	635.4-M
Benzo(a)pyrene	-	<1.5	<1.8-R	38.6-M	<1.4-M	<1.7-M	<1.7-M	<1.5-R	<1.5-M	<1.4-M	18.6-M	<1.4-R	12.7-M	8.6-M	5.0-M	<1.7-M	<1.6-M	<1.6-R	<1.7-R	<1.5-R	<1.6-R	12.8-M	<1.7-R	<1.6-M	<1.6-R	<0.025-R	<1.5-R
Benzo(b)fluoranthene	-	<1.2	<1.5-R	<1.3-R	<1.3-M	<1.5-M	<1.4-M	<1.3-R	<1.2-M	<1.2-M	<1.2-M	<1.2-R	<1.2-M	<1.4-M	<1.4-M	<1.4-M	<1.3-M	<1.5-R	<1.4-M	<1.4-M	<1.4-M	<1.4-M	<1.4-M	<1.4-M	<1.3-M	<0.028-R	<1.2-R
Benzo(k)fluoranthene	-	<1.3	<1.7-R	<1.4-R	<1.3-M	<1.6-M	<1.5-M	<1.4-R	<1.4-M	<1.3-M	<1.3-M	<1.3-R	<1.3-M	<1.5-M	<1.6-M	<1.6-M	<1.4-M	<1.5-R	29.6-R	<1.4-R	<1.5-R	<1.5-M	<1.5-R	<1.5-M	<1.5-R	<0.009-R	<1.4-R
Chrysene	-	<2.9	446.6-F	<3.1-R	<2.8-M	<3.4-M	1010.0-M	<2.9-R	4.4-M	<2.8-M	1042.1-M	<2.8-R	236.7-M	81.7-F	<3.3	69.6-F	<3.1	<3.2-R	<3.3	<3.0	38.2-F	<3.3	50.0-F	<3.2	<3.1	<0.0017-R	<2.9-R
Dibenzo(a,h)anthracene	-	<2.8	<3.5-R	<3.0-R	<2.8-M	<3.4-M	<3.2-M	<2.9-R	<2.9-M	<2.8-M	<2.7-M	<2.8-R	<2.9-M	10.6-J	<3.3	<3.3	<3.1	<3.2-R	<3.3	<3.0	<3.2	<1.4-M	<3.3	<3.2	<3.1	<0.071-R	<2.9-R
Indeo(1,2,3-cd)pyrene	-	<1.3	<1.7-R	<1.4-R	<1.3-M	<1.6-M	<1.5-M	<1.4-R	<1.4-M	<1.3-M	<1.3-M	<1.3-R	<1.4-M	<1.5-M	717.4-M	<1.6-M	<1.4-M	<1.5-R	<1.5-M	<1.4-M	<1.5-M	<1.5-M	<1.5-M	<1.5-M	<1.5-M	<0.080-R	<1.4-R
Total Carcinogenic PAHs[9]	*100*	-	*1338.2*	*335.1*	*6*	*22.7*	*1171.3*	-	*6.2*	*2.6*	*1298.7*	-	*297.8*	*303.4*	*847*	*278.3*	-	-	*29.6*	-	*55.2*	*191.8*	*54.8*	-	-	-	*635.4*
Acenaphthylene	NE[7]	<12.6	<158.0-M	<270.0-M	<12.4-M	<15.1-M	<14.4-M	337.1-R	<12.9-M	<12.5-M	114.3-M	<12.3-R	45.4-M	<14.2	<14.8	<14.9	<13.7	<14.3-R	<14.6	<13.4	<14.1	62.5-F	175.2-J	<14.1	<13.9	<0.26-R	286.9-R
Acenaphthene	NE	<7.8	<9.8-R	4276.8-R	55.0-F	<9.3	1743.8-J[8]	<8.0-R	73.0-F	<7.7	<7.5	<7.6-R	<7.9	<8.8-M	<9.1-M	<9.2-M	<8.4-M	<8.9-R	<9.0-M	<8.3-M	<8.7-M	<9.0-M	<9.0-M	<8.7-M	<8.6-M	<0.14-R	<8.0-R
Fluorene	NE	<20.1	2895.3-M	3095.4-R	<19.7-M	90.9-M	1459.2-M	<5.1-R	<20.5-M	<19.8-M	306.7-M	<19.6-R	89.2-M	712.8-M	<23.5-M	<23.6-M	2067.3	2085.0-M	1195.4-M	<21.3-M	<22.5-M	<23.3	<23.5-M	<22.5-M	<22.1-M	<0.11-R	1374.9-R
Phenanthrene	NE	<6.0	6665.2-M	11792.1-M	7.2-M	<7.2-M	5298.4-M	5457.6-M	<6.1-M	45.3-M	1430.6-M	<5.9-R	354.2-M	2565.3-M	129.5-M	3811.3-M	657.3-M	4327.2-M	4583.0-M	<6.4-M	34.9-M	<7.0-M	121.1-M	8.7-M	<6.6-M	<0.04-R	3516.1-M
Anthracene	NE	<0.6	<0.8-R	274.8-R	<0.6-M	<0.7-M	<0.7-M	<0.6-R	1.7-M	<0.6-M	<0.6-M	<0.6-R	<0.6-M	398.8-M	239.2-M	592.6-M	<0.7-M	<0.7-R	131.3-M	<0.6-M	<0.7-M	152.5-M	1.6-M	<0.7-M	<0.7-M	<0.01-R	<0.6-R
Fluoranthene	NE	<5.0	6331.8-M	42540.9-M	23.6-M	1957.0-M	19077.2-M	62024.8-M	27.1-M	75.7-M	14555.0-M	8.7-R	3620.8-M	6065.4-M	3710.5-M	9602.7-M	4333.6-M	<5.7-R	14648.3-M	15.7-M	288.2-M	3145.2-M	1091.1-M	235.7-M	<5.5-M	<0.04-R	8638.3-M
Pyrene	NE	<5.2	<6.5-R	39676.7-M	<5.0-M	1684.3-M	18035.3-M	<5.3-R	<5.3-M	<5.1-M	<49.7-M	<5.0-R	3046.3-M	6255.0-M	<60.4-M	10303.8-M	<5.6-M	<5.8-R	12073.4-M	10.2-M	<5.8-M	2974.3-M	<6.0-M	<5.8-M	7.2-M	<0.04-R	<5.3-R
Benzo(g,h,i)perylene	NE	<3.9	<4.9-R	<4.2-R	<3.8-M	<4.7-M	<4.5-M	<4.0-R	<4.0-M	<3.9-M	3.8-M	<3.8-R	<4.0-M	<4.4-M	<4.6-M	<4.6-M	<4.2-M	<4.5-R	<4.5-R	<4.2-R	<4.4-R	<4.5-M	<4.5-R	<4.4-M	<4.3-R	0.192-R	<4.0-R

Analytical Results - Phase II Excavation Confirmation Soil Sampling

Parameter	MTCA Method A Cleanup Levels	400 Mitchell			324 Eichenberger		102B Armstrong	102A Armstrong				102A Armstrong Back Yard					QA/QC	
		GHH-400-UH02	GHH-400-WEST02	GHH-400-NORTH02	GHH-324-WEST02	GHH-324-SOUTH02	GHH-102B-SOUTH02	GHH-102A-SOUTH02	GHH-102A-NE02	GHH-102A-WEST02	GHH-102A-N.WEST02	GHH-102ABY-WEST02	GHH-102ABY-S.WEST02	GHH-102ABY-S.EAST02	GHH-102ABY-EAST02	GHH-102ABY-NORTH02	GHH-102ABY-NORTH102	GHH-102A-WEST52
Sample Location		Under House	New West Wall	New North Wall	New West Wall	New South Wall	New South Wall	New South Wall	North Wall East	New West Wall	North Wall West	Back Yard West Wall	Back Yard West Wall South	Back Yard West Wall East	Back Yard East Wall	Back Yard North Wall	Rinsate Blank	Field Duplicate
Sampling Date		5/25/2005	5/25/2005	5/25/2005	5/25/2005	5/25/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005	5/26/2005
Diesel	2000	1300	<7.1	<5.9	<6.0	7.4	15	1200	15	<6.4	22	<6.2	<6.1	<6.4	<6.1	31	<0.25	<6.3
Motor Oil	2000	<73	<14	<12	16	<12	<12	<65	<12	<13	18	<12	<12	<13	<12	<13	<0.50	<13
Benzene	30	<2.9	<3.1	<2.1	<2.1	<2.1	<2.2	<2.4	<2.0	<2.4	<2.6	<2.2	<2.1	<2.4	<2.1	<2.2	<0.2	<2.5
Ethylbenzene	6000	<2.9	<3.1	<2.1	<2.1	<2.1	<2.2	<2.4	<2.0	<2.4	<2.6	<2.2	<2.1	<2.4	<2.1	<2.2	0.2-F	<2.5
Xylenes	9000	<5.8	<6.2	<4.2	<4.2	<4.2	<4.4	<4.8	<4.0	<4.8	7.7-F	<4.4	<4.2	<4.8	<4.2	<4.4	<0.7	<5.0
Toluene	7000	<2.9	<3.1	<2.1	<2.1	<2.1	<2.2	<2.4	<2.0	<2.4	<2.6	<2.2	<2.1	<2.4	<2.1	<2.2	<0.2	<2.5
Naphthalene	-	<15	<14	<12	<12	<12	<12	<13	<12	<13	<12	<12	<12	<13	<12	<12	<0.47	<13
1-methylnaphthalene	-	<29	<28	<24	<24	<25	<25	2300-J	<24	<25	<24	<25	<24	<25	<24	240-F	<0.47	<26
2-methylnaphthalene	-	<29	<28	<24	<24	<25	<25	410-J	<24	<25	<24	<25	<24	<25	<24	<25	<0.47	<26
Total naphthalenes	*5000*	-	-	-	-	-	-	2710	-	-	-	-	-	-	-	240	-	-
Benzo(a)anthracene	-	<1.5	<1.4	<1.2	<1.2	<1.2	<1.2	1000	42	<1.3	<1.2	14	<1.2	<1.3	<1.2	42	<0.047	<1.3
Benzo(a)pyrene	-	<1.5	<1.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.2	<0.047	<1.3
Benzo(b)fluoranthene	-	15-J	<2.8	<2.4	<2.4	<2.5	<2.5	<2.7	<2.4	<2.5	11-F	<2.5	<2.4	<2.5	<2.4	<2.5	<0.094	<2.6
Benzo(k)fluoranthene	-	<1.5	<1.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.2	<0.047	<1.3
Chrysene	-	<1.5	<1.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.2	<0.047	<1.3
Dibenzo(a,h)anthracene	-	<5.8	<5.6	<4.8	<4.9	<4.9	<5.0	<5.3	<4.8	<5.1	<4.7	<4.9	<4.8	<5.1	<4.8	<4.9	<0.094	<5.1
Indeo(1,2,3-cd)pyrene	-	<1.5	<1.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.2	<0.047	<1.3
Total Carcinogenic PAHs	*100*	15	-	-	-	-	-	-	-	-	11	14	-	-	-	42	-	-
Acenaphthene	NE	<15	<14	<12	<12	<12	<12	69-J	<12	<13	<12	<12	<12	<13	<12	<12	<0.47	<13
Acenaphthylene	NE	29-J	<28	<24	<24	<25	<25	<27	<24	<25	<24	<25	<24	<25	<24	<25	<0.47	<26
Fluorene	NE	<2.9	<2.8	<2.4	<2.4	<2.5	<2.5	520-J	4.9-F	<2.5	<2.4	<2.5	<2.4	<2.5	<2.4	40-F	<0.94	<2.6
Phenanthrene	NE	110-J	<1.4	<1.2	<1.2	<1.2	<1.2	2000	27-F	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	160	<0.047	<1.3
Anthracene	NE	<1.5	<1.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.2	<0.047	<1.3
Fluoranthene	NE	<2.9	<2.8	<2.4	<2.4	<2.5	<2.5	<2.7	<2.4	<2.5	<2.4	<2.5	<2.4	<2.5	<2.4	<2.5	<0.094	<2.6
Pyrene	NE	120-J	<1.4	<1.2	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.2	<0.094	<1.3
Benzo(g,h,i)perylene	NE	<2.9	<2.8	<2.4	<2.4	<2.5	<2.5	<2.7	<2.4	<2.5	<2.4	<2.5	<2.4	<2.5	<2.4	<2.5	<0.094	<2.6

Analytical Results - Monitoring Well Installation Soil Sampling

Parameter	MTCA Method A Cleanup Levels	Monitoring Well				
		GHH-MW10-0104	GHH-MW11-0116	GHH-MW12-0124	GHH-MW11-5116	GHH-MW12-2124
Sample Location		4 to 6 feet bgs	6 to 8 feet bgs	4 to 6 feet bgs	field duplicate	rinsate blank
Sampling Date		11/18/2004	11/18/2004	11/18/2004	11/18/2004	11/18/2004
Diesel	2000	<5.0	<5.0	<5.0	<5.0	<0.25
Motor Oil	2000	<10	<10	11	<10	<0.50
Benzene	30	<0.89	<0.92	1.24-F	<0.91	<0.10
Ethylbenzene	6000	<0.67	<0.70	<0.75	<0.69	<0.16
Xylenes	9000	<1.62	<1.68	<1.80	<1.77	<0.32
Toluene	7000	<0.80	2.89-F	22.61	2.16-F	0.14-F
Naphthalene	-	<12.1	<11.0	<12.8	<11.0	<0.11
1-methylnaphthalene	-	<6.9	<6.3	<7.3	<6.3	<0.12
2-methylnaphthalene	-	<6.7	<6.1	<7.1	<6.1	<0.08
Total naphthalenes	*5000*	-	-	-	-	-
Benzo(a)anthracene	-	<0.9	<0.8	<0.9	<0.8	<0.004
Benzo(a)pyrene	-	<2.1	<1.9	<2.2	<1.9	<0.025
Benzo(b)fluoranthene	-	<1.8	<1.6	5.4-F	3.7-F	0.062-F
Benzo(k)fluoranthene	-	<1.9	2.2-F	<2.0	<1.7	<0.009
Chrysene	-	<4.1	<3.7	<4.3	<3.7	<0.017
Dibenzo(a,h)anthracene	-	7.0-F	<3.7	<4.3	<3.7	0.086-F
Indeo(1,2,3-cd)pyrene	-	<1.9	<1.7	<2.0	1.8-F	<0.080
Total Carcinogenic PAHs	*100*	7	2.2	5.4	5.5	0.148
Acenaphthene	NE	<11.2	<10.2	<11.8	35.5-F	<0.14
Acenaphthylene	NE	<18.1	<16.5	64.5-F	<16.5	<0.26
Fluorene	NE	<28.8	<26.2	<30.4	<26.2	<0.11
Phenanthrene	NE	<8.6	<7.9	<9.1	<7.9	<0.04
Anthracene	NE	<0.9	<0.8	<0.9	<0.8	<0.01
Fluoranthene	NE	<7.1	<6.5	<7.5	<6.5	<0.04
Pyrene	NE	<7.4	<6.7	<7.8	<6.7	<0.04
Benzo(g,h,i)perylene	NE	<5.6	<5.1	<5.9	<5.1	<0.170

1 Method A values are from Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC, WDOE Publication #94-06 Revised January 2003.
2 Diesel and Motor Oil Results in mg/Kg (ppm)
3 Results other than Diesel and Motor Oil in ug/Kg.
4 AFCEE flag indicating the analyte was positivley identified, but the associated numerical value is below the reporting limit.
5 AFCEE flag indicating a matrix effect was present.
6 AFCEE flag indicating the data are unusable due to deficiencies in the ability to analyze the sample and meet quality control criteria.
7 NE- Not Established.
8 AFCEE flag indicating the analyte was positively identified, but the quantitation is an estimation.
9 Carcinogenic PAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeo(1,2,3-cd)pyrene
10 Rinsante blank matrix is water in reported mg/L and ug/L
Note: Bolded numbers indicate detections above the method detection limit but below cleanup levels. Bolded and highlighted numbers indicate detections exceeding cleanup levels.

APPENDIX D
Surveying Data

MONITORING WELL LOCATION SURVEY

FOR

URS CORPORATION

GEIGER HEIGHTS
SPOKANE, WASHINGTON

AS OBSERVED ON FEBRUARY 9, 2005
REFERENCE JOB NO. USKH 805301 AND 00036

SURVEY NARRATIVE & SUMMARY
GEIGER HEIGHTS SITE
SPOKANE, WASHINGTON

On June 21, 2000, USKH, Inc (formerly Wyatt Engineering Inc.), performed a field survey and developed a list of horizontal coordinates and elevations for monitoring wells located at Geiger Heights in Spokane County, Washington. A report for that work is dated June 21, 2000. The basis for the horizontal coordinates in that report and their rotation was assumed. The elevations listed in that report were also assumed.

On February 9, 2005, additional monitoring wells were observed. The new coordinates were established using a Trimble 5600 Total Station Theodolite and a TSCe Data Collector. All control points were derived from a closed loop based on previous work done in 2000, thereby providing a check on our current measurements. Horizontal control points on site were checked and confirmed with reference to the previous control work. All data was gathered electronically with the data collector and then transferred electronically into the computer for processing. Coordinate processing was accomplished using Trimble Geomatic Office software.

The horizontal coordinates of the monitoring wells were measured to the center of the monitoring well lid.

The elevations for all Monitoring wells were established using a spirt level and rod through a checked loop. Rim elevations were observed on the north side of the Monitoring Well case. PVC pipe elevations were observed on the north side of the pipe.

MONITORING WELL COORDINATES AND ELEVATIONS

Code	Northing	Easting	Elevation Rim	Elevation PVC	Point No.
MW 10	8980.18	11886.56	994.25	993.99	62
MW 11	9683.49	9398.00	1001.00	1000.79	60
MW 12	9703.81	11654.67	993.60	993.25	61

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