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Shaw™ Shaw Environmental, Inc.

May 3, 2004

SHAW-MC-CK05-0792
Project No. 774645

Mr. Lee Coker
U.S. Army Corps of Engineers, Mobile District
Attn: EN-GE/Lee Coker
109 St. Joseph Street
Mobile, Alabama 36602

Contract: **DACA21-96-D-0018, Task Order CK05**
Fort McClellan, Alabama

Subject: **Final Supplemental RI Results and Decision Document for the Old Water Hole – Pelham Range, Parcel 205(7)**

Dear Mr. Coker:

I am enclosing one copy each (including compact disc) of the subject documents. Comments received on the draft report were incorporated into this final version as discussed in the responses to comments included with this submittal. Please file these documents in your records and provide a letter of concurrence.

At your request, I have distributed copies of these documents as indicated below. If you have questions, or need further information, please contact me at (770) 663-1429 or Steve Moran at (865) 694-7361.

Sincerely,

Jeanne A. Yacoub, P.E.
Project Manager

Attachments

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1.0 Site Description/History

Parcel 205(7) is an approximately 9-acre area located within Training Area 5C in the northeast region of Pelham Range (Figure 1). The Old Water Hole is an irregularly shaped, shallow depression measuring approximately 60 by 120 feet. The site was reportedly used for the disposal of a variety of wastes, including chemical ordnance, supertropical bleach containers, fog oil drums, smoke pots, bullet shell casings, flares, and smoke rounds (U.S. Army Center for Health Promotion and Preventive Medicine [CHPPM], 1999).

2.0 Previous Investigations

Previous investigations conducted at the Old Water Hole included a metal detection sweep by the U.S. Army Technical Escort Unit, a remedial investigation (RI) by Science Applications International Corporation (SAIC), and a chemical warfare material (CWM) site investigation (SI) conducted by Parsons Engineering Science, Inc. (Parsons).

U.S. Army (1992). In 1992, the U.S. Army Technical Escort Unit conducted a qualitative metal detection sweep of the site. The metal detection sweep indicated the potential for buried metallic objects at the site.

SAIC (1995). In 1995, SAIC conducted an RI at the Old Water Hole consisting of a geophysical survey, miniature continuous air monitoring system (MINICAMS) screening, collection and analysis of seven soil samples, and installation and sampling of five groundwater monitoring wells. The geophysical survey identified some subsurface anomalies; however, there was no indication of large-scale burial. MINICAMS screening for distilled mustard (HD), sarin (GB), and nerve agents did not indicate CWM above the 0.8 milligrams per cubic meter time-weighted average (instrumental baseline). Soil analytical results indicated the presence of volatile organic compounds (VOC) and semivolatile organic compounds (SVOC). CWM breakdown products and explosive compounds were not detected.

The groundwater analytical results indicated the presence of metals, SVOCs, and pesticides with isolated detections of explosive compounds and polychlorinated biphenyls (PCB). PCB Aroclor 1248 was detected in the upgradient monitoring well (OWH-G02) and the downgradient well (OWH-G05). The RI concluded that there is no current or imminent hazard at the Old Water Hole based on its present land use (i.e., military training). However, under other reuse scenarios

(e.g., residential or industrial), the RI identified chemicals of concern in groundwater, including metals, SVOCs (primarily polynuclear aromatic hydrocarbons [PAH]), three pesticides, one PCB, and one explosive compound.

Constituents of potential ecological concern (COPEC) identified in the RI were benzyl alcohol and phenol in surface soil. The RI recommended additional surface and subsurface soil sampling to complete the evaluation of the study area (SAIC, 2000).

Parsons (2002). In 2002, Parsons conducted an SI at three Pelham Range sites, including the Old Water Hole, to determine the presence or absence of CWM. The SI consisted of exploratory excavation of two large geophysical anomalies previously identified by SAIC and the collection and analysis of six soil samples. Field air monitoring (including MINICAMS screening) and subsequent laboratory analysis for CWM and related breakdown products (1,4-dithiane, 1,4-thioxane, GB, HD, and lewisite) indicated that these constituents were not present in the samples. Additionally, no CWM-related items were discovered during the investigation (Parsons, 2002).

3.0 Supplemental RI Field Activities

Supplemental RI field activities conducted by Shaw Environmental, Inc. (Shaw) (formerly IT Corporation [IT]) at the Old Water Hole included the collection and analysis of surface soil samples, subsurface soil samples, and groundwater samples (IT, 2002a). In addition, four groundwater monitoring wells were installed to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information. The sample location rationale are provided in Table 1.

Soil Sampling. Six surface soil samples and six subsurface soil samples were collected for chemical analysis at the locations shown on Figure 2. Surface soil samples were collected from the uppermost foot of soil using either a stainless-steel hand auger or a direct-push technology (DPT) sampling system, following methodology specified in the installation-wide sampling and analysis plan (SAP) (IT, 2000a, IT, 2002b). Subsurface soil samples were collected at depths greater than 1 foot below ground surface using a DPT sampling system in accordance with procedures in the SAP. The samples were analyzed for the following parameters, using U.S. Environmental Protection Agency (EPA) analytical methods:

- Target analyte list (TAL) metals – EPA Methods 6010B/7471A
- Target compound list (TCL) VOCs – EPA Method 8260B
- TCL SVOCs – EPA Method 8270C
- Nitroaromatic/nitramine explosives – EPA Method 8330
- CWM breakdown products (including orthosulfur compounds) – EPA Methods 8321 and 8270M.

Monitoring Well Installation. Two deep residuum monitoring wells (OWH-205-MW08 and OWH-205-MW09) and two bedrock monitoring wells (OWH-205-MW06 and OWH-205-MW07) were installed at the Old Water Hole to collect groundwater samples for laboratory analysis. The well locations are shown on Figure 2. Table 2 summarizes construction details of the wells installed at the site. The well construction logs are included in Appendix A.

Shaw contracted Miller Drilling Company to install the permanent wells using hollow-stem auger and air-rotary drilling methods, following procedures outlined in the SAP. The boreholes (except OWH-205-MW09) were advanced with a 4¼-inch inside diameter (ID) hollow-stem auger from ground surface to the depth of auger refusal. A 2-foot-long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. At the depth of auger refusal, each borehole was advanced using a 7⅞-inch ODEX® hammer bit, while simultaneously installing 8-inch steel outer casing to prevent the borehole from collapsing. The bottom of the outer casing was set in place approximately 10 feet below the depth of competent bedrock. Conventional air-rotary drilling was used to advance the borehole from the depth of the outer casing to the target borehole depth. At monitoring well location OWH-205-MW09, ODEX® air-rotary drilling procedures were used during borehole installation. Hollow-stem auger and air-rotary drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geological and hydrogeological information. Soil characteristics were described using the "Burmeister Identification System" described in Hunt (1986) and the Unified Soil Classification System as outlined in American Society for Testing and Materials (ASTM) Method D 2488 (ASTM, 2000). The boring logs are included in Appendix A.

Upon reaching the target depth in each borehole, a 10-or 20-foot length of 4-inch ID, 0.010-inch continuous slot, Schedule 80 polyvinyl chloride (PVC) screen with a PVC end cap was placed

inside the borehole to the total depth of the boring. The screen and end cap were attached to 4-inch ID, flush-threaded Schedule 80 PVC riser. A filter pack consisting of Number 1 and Number 0 filter sand (environmentally safe, clean fine sand) was tremied through the outer casing and around the well screen to approximately 7 to 10 feet above the top of the well screen. A bentonite seal was placed immediately on top of the filter pack and hydrated with potable water. Bentonite seal placement and hydration followed procedures outlined in the SAP. Bentonite-cement grout was tremied into the remaining annular space of the well from the top of the bentonite seal to ground surface. A locking protective steel casing was placed over the top of the PVC well casing, and a concrete pad was constructed around the wellhead.

Groundwater Sampling. Groundwater samples were collected during supplemental RI activities, including samples from five existing monitoring wells (OWH-G01 through OWH-G05) and samples from the four newly installed wells. For the purpose of this investigation, existing wells OWH-G01 through OWH-G05 were designated OWH-205-MW01 through OWH-205-MW05, respectively. The monitoring well locations are shown on Figure 2. Prior to sampling, the wells installed by Shaw were developed in accordance with procedures specified in the SAP. The well development logs are included in Appendix B. The wells were purged and sampled using a bladder pump equipped with Teflon® tubing and/or using a bailer, following procedures outlined in the SAP. Field parameters were recorded during purging to ensure stabilization of the groundwater prior to sampling, as summarized in Table 3. The samples were analyzed for the following parameters:

- TAL metals – EPA Methods 6010B/7470A
- TCL VOCs – EPA Method 8260B
- TCL SVOCs – EPA Method 8270C
- Chlorinated pesticides – EPA Method 8081A
- Organophosphorus pesticides – EPA Method 8141A
- Chlorinated herbicides – EPA Method 8151A
- PCBs – EPA Method 8082
- Nitroaromatic/nitramine explosives – EPA Method 8330
- CWM breakdown products (including orthosulfur compounds) – EPA Methods 8321 and 8270M.

Sample Preservation, Packaging, and Shipping. Sample preservation, packaging, and shipping followed requirements specified in the SAP. Sample documentation and chain-of-custody records were completed as specified in the SAP. Completed analysis request and chain-of-custody records (Appendix C) were included with each shipment of sample coolers to EMAX Laboratories, Inc. in Torrance, California.

Water Level Measurements. The depth to groundwater was measured in wells at the site on April 10, 2003, following procedures outlined in the SAP. Depth to groundwater was measured with an electronic water level meter. The meter probe and cable were cleaned before use at each well following decontamination methodology presented in the SAP. Measurements were referenced to the top of the PVC well casing, as presented in Table 4.

Surveying. Sample locations were surveyed using global positioning system and conventional civil survey techniques described in the SAP. Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Table 5.

Variances. One variance to the site-specific work plan was recorded during field activities at the Old Water Hole. The four wells installed at the site were constructed as double-cased wells rather than single-cased wells as proposed in the work plan. The variance did not alter the intent of the investigation or the sampling rationale presented in the work plan. The variance report is included in Appendix D.

4.0 Site-Specific Geology and Hydrology

Subsurface investigations performed at the Old Water Hole, Parcel 205(7), provided soil, geologic, and groundwater data used to characterize the geology and hydrogeology of the site.

Soils. Soils at the Old Water Hole fall mainly into two mapping units: Fullerton cherty silty clay loam in the central and southeast portion of the site and Clarksville-Fullerton stony loams to the northwest (U.S Department of Agriculture [USDA], 1961). The Fullerton cherty silty clay loam (6 to 10 percent) consists of strongly acid, well-drained soils that have developed from the residuum of cherty limestone. The surface soil of this mapping unit has a finer texture and

surface runoff is more rapid. Surface soil ranges from strong brown to yellowish red cherty silty clay loam.

The Clarksville-Fullerton stony loams (10 to 15 percent) have developed on uplands in the residuum of cherty limestone. The soils are strongly acid and well drained with a slower runoff. The surface soil of this mapping unit is described as brown to dark brown with frequent stones and shallowness (USDA, 1961).

Site Geology. Bedrock beneath the Old Water Hole is mapped as the Cambrian/Ordovician Undifferentiated Knox Group (Osborne et al., 1997). The Undifferentiated Knox Group, in order from oldest to youngest, is divisible into the Copper Ridge Dolomite, Chepultepec Dolomite, and Longview and Newala Limestones (Raymond et al., 1988). This formation is described as light gray to light-brownish-gray limestone, dolomitic limestone and dolomite, containing fine to medium, rounded, frosted quartz sand and white to light-gray to brownish-gray chert. Minor amounts of gray and green shale and thin sandstone zones are also noted in the lower Knox (Raymond et al., 1988).

A geologic cross section was constructed using the boring log data, as shown on Figure 3. The cross section location is shown on Figure 2. The shallow soils encountered during drilling were typically described as light-to-dark brown and light gray, moist, clay and silt, with trace amounts of sand and gravel (chert and shale), which is consistent with the aforementioned Clarksville and Fullerton soil mapping units. With increased depth, the residuum encountered during drilling was described as yellowish orange to light gray, stiff, moist clay with varying amounts of silt and sand. Dark gray, microcrystalline, subangular to angular weathered chert gravel and white to gray, slightly weathered, soft to moderately hard sandstone gravel were encountered in the residuum at depths ranging from ground surface to 148 feet below ground surface (bgs). Thin zones of sand and silt were also noted at depth in the borings. Light olive gray, moderately hard, slightly weathered, fine-grained dolomite gravel was typically encountered shortly before hollow-stem auger refusal. Bedrock was encountered at depths ranging from 88 to 148 feet bgs. Bedrock was described as light olive gray, moderately hard, fine grained, unweathered, moderately to intensely fractured dolomite with undetermined bedding. This lithology is consistent with the description of the Undifferentiated Knox Group.

Hydrogeology. Static groundwater levels were measured in monitoring wells at the Old Water Hole on April 10, 2003, as summarized in Table 4. Groundwater elevations were calculated by measuring the depth to groundwater relative to the surveyed top-of-casing elevations. A

groundwater flow map was constructed using the April 2003 data, as shown on Figure 4. Based on these water level data, groundwater elevations correspond with site topography and the flow direction in the immediate area is semi-radial towards the Old Water Hole. However, based on regional groundwater flow at Pelham Range, groundwater typically follows the general topography, flowing away from the ridges and into the valleys. Therefore, it is inferred that groundwater eventually flows south from the Old Water Hole.

5.0 Supplemental RI Data Summary

The results of the chemical analysis of samples collected at the Old Water Hole, Parcel 205(7), indicate that metals and VOCs were detected in the various site media. In addition, one CWM breakdown product was detected in one groundwater sample. SVOCs, pesticides, herbicides, PCBs, and explosive compounds were not detected in site media. The reported analytical data were validated in accordance with EPA National Functional Guidelines by Level III criteria and are presented in Appendix E.

To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, the analytical results were compared to residential human health site-specific screening levels (SSSL), ecological screening values (ESV), and metals background screening values for FTMC. The SSSLs and ESVs were developed by Shaw for human health and ecological risk evaluations as part of environmental investigations performed under the Base Realignment and Closure (BRAC) Environmental Restoration Program at FTMC (IT, 2000b). Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (SAIC, 1998). Site metals data were further evaluated using statistical and geochemical methods to select site-related metals.

Surface Soil Analytical Results. A total of 19 metals and three VOCs (acetone, methylene chloride, and trichlorofluoromethane) were detected in the surface soil samples (Table 6). The concentrations of five metals (aluminum, arsenic, chromium, iron, and manganese) exceeded SSSLs. Of these, arsenic (16.1 milligrams per kilogram [mg/kg]), iron (34,500 mg/kg), and chromium (43.5 mg/kg) results exceeded their respective background values (13.7, 34,200, and 37 mg/kg) in one sample each. The VOC results were all below SSSLs.

Seven metals (aluminum, arsenic, chromium, iron, manganese, selenium, and vanadium) were detected at concentrations exceeding ESVs. These metals results were below background except

for arsenic, chromium, and iron in one sample each and selenium in three samples. Two of the three selenium results were flagged with a "B" data qualifier, signifying that selenium was also detected in an associated laboratory or field blank sample. The VOC results were all below ESVs.

Subsurface Soil Analytical Results. A total of 18 metals and one VOC (methylene chloride) were detected in the subsurface soil samples (Table 7). The concentrations of three metals (aluminum, arsenic, and iron) exceeded SSSLs. Of these, only arsenic (37.8 mg/kg) in one sample exceeded its background value (18.3 mg/kg). The VOC results were all below the SSSL.

Groundwater Analytical Results. A total of 15 metals, two VOCs (acetone and methylene chloride), and one CWM breakdown product (methylphosphonic acid) were detected in the groundwater samples (Table 8). The concentrations of five metals (arsenic, chromium, manganese, vanadium, and thallium) exceeded SSSLs in one or more samples. Of these, only thallium in one sample also exceeded its background value (note: a background value was not available for chromium, which was detected at estimated concentrations above its SSSL in two samples). The thallium result was flagged with a "B" data qualifier, indicating that the metal was also detected in an associated laboratory or field blank sample. Because the thallium result was "B" qualified, it is considered a laboratory artifact rather than site-related contamination. The VOC and CWM breakdown product results were all below SSSLs.

Statistical and Geochemical Evaluation of Metals. Site metals data were further evaluated using statistical and geochemical methods to determine if the metals detected in site media are naturally occurring (Appendix F). This multi-tiered approach is described in the technical memorandum "Selecting Site-Related Chemicals for Human Health and Ecological Risk Assessments for FTMC: Revision 2" (Shaw, 2003). The statistical and geochemical evaluation determined that all of the metals detected in site media are present at naturally occurring levels.

6.0 Conclusions and Recommendations

Constituents detected at concentrations exceeding SSSLs and background were identified as chemicals of potential concern (COPC) in site media. COPCs included three metals (arsenic, chromium, and iron) in one surface soil sample each and arsenic in one subsurface soil sample.

Chromium was also conservatively identified as a COPC in groundwater because it exceeded its SSSL in two samples but has no background value. However, the statistical and geochemical evaluation concluded that all of the metals detected in site media are present at naturally occurring levels.

Surface soil constituents detected at concentrations exceeding ESVs and background (where available) were identified as COPECs. COPECs were four metals (arsenic, chromium, iron, and selenium) in one surface soil sample each. However, the statistical and geochemical evaluation concluded that all of the metals detected in site media are present at naturally occurring levels.

Based on the results of the investigation, past operations at the Old Water Hole have not adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, Shaw recommends "No Further Action" and unrestricted land reuse with regard to hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act at the Old Water Hole, Parcel 205(7).

7.0 References

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

List of Abbreviations and Acronyms

2,4-D	2,4-dichlorophenoxyacetic acid
2,4,5-T	2,4,5-trichlorophenoxyacetic acid
2,4,5-TP	2,4,5-trichlorophenoxypropionic acid
3D	3D International Environmental Group
AB	ambient blank
AbB3	Anniston gravelly clay loam, 2 to 6 percent slopes, severely eroded
AbC3	Anniston gravelly clay loam, 6 to 10 percent slopes, severely eroded
AbD3	Anniston and Allen gravelly clay loams, 10 to 15 percent slopes, eroded
ABLM	adult blood lead model
Abs	skin absorption
ABS	dermal absorption factor
AC	hydrogen cyanide
ACAD	AutoCadd
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded
ACGIH	American Conference of Governmental Industrial Hygienists
AdE	Anniston and Allen stony loam, 10 to 25 percent slope
ADEM	Alabama Department of Environmental Management
ADPH	Alabama Department of Public Health
AEC	U.S. Army Environmental Center
AEDA	ammunition, explosives, and other dangerous articles
AEL	airborne exposure limit
AET	adverse effect threshold
AF	soil-to-skin adherence factor
AHA	ammunition holding area
AL	Alabama
ALARNG	Alabama Army National Guard
ALAD	δ-aminolevulinic acid dehydratase
ALDOT	Alabama Department of Transportation
amb.	amber
amsl	above mean sea level
ANAD	Anniston Army Depot
AOC	area of concern
AP	armor piercing
APEC	areas of potential ecological concern
APT	armor-piercing tracer
AR	analysis request
ARAR	applicable or relevant and appropriate requirement
AREE	area requiring environmental evaluation
AS/SVE	air sparging/soil vapor extraction
ASP	Ammunition Supply Point
ASR	Archives Search Report
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
AT	averaging time
atm-m^3/mol	atmospheres per cubic meter per mole
ATSDR	Agency for Toxic Substances and Disease Registry
ATV	all-terrain vehicle
AUF	area use factor
AWARE	Associated Water and Air Resources Engineers, Inc.
AWQC	ambient water quality criteria
AWWSB	Anniston Water Works and Sewer Board
‘B’	Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)
BCF	blank correction factor; bioconcentration factor
BCT	BRAC Cleanup Team
BERA	baseline ecological risk assessment
BEHP	bis(2-ethylhexyl)phthalate
BFB	bromofluorobenzene
BFE	base flood elevation
BG	Bacillus globigii
BGR	Bains Gap Road
bgs	below ground surface
BHC	hexachlorocyclohexane
BHHRA	baseline human health risk assessment
BIRTC	Branch Immaterial Replacement Training Center
bkg	background
bls	below land surface
BOD	biological oxygen demand
Bp	soil-to-plant biotransfer factors
BRAC	Base Realignment and Closure
Braun	Braun Intertec Corporation
BSAF	biota-to-sediment accumulation factors
BSC	background screening criterion
BTAG	Biological Technical Assistance Group
BTEX	benzene, toluene, ethyl benzene, and xylenes
BTOC	below top of casing
BTV	background threshold value
BW	biological warfare; body weight
BZ	breathing zone; 3-quinuclidinyl benzilate
C	ceiling limit value
Ca	carcinogen
$CaCO_3$	calcium carbonate
CAA	Clean Air Act
CAB	chemical warfare agent breakdown products
CACM	Chemical Agent Contaminated Media
CAMU	corrective action management unit
CBR	chemical, biological, and radiological
CCAL	continuing calibration
CCB	continuing calibration blank
CCV	continuing calibration verification
CD	compact disc
CDTF	Chemical Defense Training Facility
CEHNC	U.S. Army Engineering and Support Center, Huntsville
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CF	conversion factor
CFC	chlorofluorocarbon
CFDP	Center for Domestic Preparedness
CFR	Code of Federal Regulations
CG	phosgene (carbonyl chloride)
CGI	combustible gas indicator
ch	inorganic clays of high plasticity
CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
CIH	Certified Industrial Hygienist
CK	cyanogen chloride
cl	inorganic clays of low to medium plasticity
Cl	chlorinated
CLP	Contract Laboratory Program
cm	centimeter
CN	chloroacetophenone
CNB	chloroacetophenone, benzene, and carbon tetrachloride
CNS	chloroacetophenone, chloropicrin, and chloroform
CO	carbon monoxide
CO_2	carbon dioxide
Co-60	cobalt-60
CoA	Code of Alabama
COC	chain of custody; chemical of concern
COE	Corps of Engineers
Con	skin or eye contact
COPC	chemical of potential concern
COPEC	constituent of potential ecological concern
CPOM	coarse particulate organic matter
CPSS	chemicals present in site samples
CQCSM	Contract Quality Control System Manager
CRDL	contract-required detection limit
CRL	certified reporting limit
CRQL	contract-required quantitation limit
CRZ	contamination reduction zone
Cs-137	cesium-137
CS	ortho-chlorobenzylidene-malononitrile
CSEM	conceptual site exposure model
CSM	conceptual site model
CT	central tendency
ctr.	container
CWA	chemical warfare agent; Clean Water Act
CWM	chemical warfare material; clear, wide mouth
CX	dichloroformoxime
‘D’	duplicate; dilution
D&I	detection and identification
DAAMS	depot area agent monitoring station

List of Abbreviations and Acronyms *(Continued)*

DAF	dilution-attenuation factor
DANC	decontamination agent, non-corrosive
ºC	degrees Celsius
ºF	degrees Fahrenheit
DCA	dichloroethane
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
DEH	Directorate of Engineering and Housing
DEHP	di(2-ethylhexyl)phthalate
DEP	depositional soil
DFTPP	decafluorotriphenylphosphine
DI	deionized
DID	data item description
DIMP	di-isopropylmethylphosphonate
DM	dry matter; adamsite
DMBA	dimethylbenz(a)anthracene
DMMP	dimethylmethylphosphonate
DNAPL	dense nonaqueous-phase liquid
DO	dissolved oxygen
DOD	U.S. Department of Defense
DOJ	U.S. Department of Justice
DOT	U.S. Department of Transportation
DP	direct-push
DPDO	Defense Property Disposal Office
DPT	direct-push technology
DQO	data quality objective
DRMO	Defense Reutilization and Marketing Office
DRO	diesel range organics
DS	deep (subsurface) soil
DS2	Decontamination Solution Number 2
DSERTS	Defense Site Environmental Restoration Tracking System
DWEL	drinking water equivalent level
E&E	Ecology and Environment, Inc.
EB	equipment blank
EBS	environmental baseline survey
EC_{20}	effects concentration for 20 percent of a test population
EC_{50}	effects concentration for 50 percent of a test population
ECBC	Edgewood Chemical Biological Center
ED	exposure duration
EDD	electronic data deliverable
EF	exposure frequency
EDQL	ecological data quality level
EE/CA	engineering evaluation and cost analysis
Elev.	elevation
EM	electromagnetic
EMI	Environmental Management Inc.
EM31	Geonics Limited EM31 Terrain Conductivity Meter
EM61	Geonics Limited EM61 High-Resolution Metal Detector
EOD	explosive ordnance disposal
EODT	explosive ordnance disposal team
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EPIC	Environmental Photographic Interpretation Center
EPRI	Electrical Power Research Institute
EPT	Ephemeroptera, Plecoptera, Trichoptera
ER	equipment rinsate
ERA	ecological risk assessment
ER-L	effects range-low
ER-M	effects range-medium
ESE	Environmental Science and Engineering, Inc.
ESL	ecological screening level
ESMP	Endangered Species Management Plan
ESN	Environmental Services Network, Inc.
ESV	ecological screening value
ET	exposure time
EU	exposure unit
Exp.	Explosives
EXTOXNET	Extension Toxicology Network
E-W	east to west
EZ	exclusion zone
FAR	Federal Acquisition Regulations
FB	field blank
FBI	Family Biotic Index
FD	field duplicate
FDC	Former Decontamination Complex
FDA	U.S. Food and Drug Administration
Fe^{+3}	ferric iron
Fe^{+2}	ferrous iron
FedEx	Federal Express, Inc.
FEMA	Federal Emergency Management Agency
FFCA	Federal Facilities Compliance Act
FFE	field flame expedient
FFS	focused feasibility study
FI	fraction of exposure
Fil	filtered
Flt	filtered
FMDC	Fort McClellan Development Commission
FML	flexible membrane liner
f_{oc}	fraction organic carbon
FOMRA	Former Ordnance Motor Repair Area
FOST	Finding of Suitability to Transfer
Foster Wheeler	Foster Wheeler Environmental Corporation
FR	Federal Register
Frtn	fraction
FS	field split; feasibility study
FSP	field sampling plan
ft	feet
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
FTA	Fire Training Area
FTMC	Fort McClellan
FTRRA	FTMC Reuse & Redevelopment Authority
g	gram
g/m^3	gram per cubic meter
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
GAF	gastrointestinal absorption factor
gal	gallon
gal/min	gallons per minute
GB	sarin (isopropyl methylphosphonofluoridate)
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GCL	geosynthetic clay liner
GC/MS	gas chromatograph/mass spectrometer
GCR	geosynthetic clay liner
GFAA	graphite furnace atomic absorption
GIS	Geographic Information System
gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar
GPS	global positioning system
GRA	general response action
GS	ground scar
GSA	General Services Administration; Geologic Survey of Alabama
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GST	ground stain
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
H&S	health and safety
HA	hand auger
HC	mixture of hexachloroethane, aluminum powder, and zinc oxide (smoke producer)
HCl	hydrochloric acid
HD	distilled mustard (bis-[dichloroethyl]sulfide)
HDPE	high-density polyethylene
HE	high explosive
HEAST	Health Effects Assessment Summary Tables
Herb.	herbicides
HHRA	human health risk assessment
HI	hazard index

H_2O_2	hydrogen peroxide
HPLC	high-performance liquid chromatography
HNO_3	nitric acid
HQ	hazard quotient
HQ_{screen}	screening-level hazard quotient
hr	hour
HRC	hydrogen releasing compound
HSA	hollow-stem auger
HSDB	Hazardous Substance Data Bank
HTRW	hazardous, toxic, and radioactive waste
'I'	out of control, data rejected due to low recovery
IASPOW	Impact Area South of POW Training Facility
IATA	International Air Transport Authority
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICRP	International Commission on Radiological Protection
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDM	investigative-derived media
IDW	investigation-derived waste
IEUBK	Integrated Exposure Uptake Biokinetic
IF	ingestion factor; inhalation factor
ILCR	incremental lifetime cancer risk
IMPA	isopropylmethyl phosphonic acid
IMR	Iron Mountain Road
in.	inch
Ing	ingestion
Inh	inhalation
IP	ionization potential
IPS	International Pipe Standard
IR	ingestion rate
IRDMIS	Installation Restoration Data Management Information System
IRIS	Integrated Risk Information Service
IRP	Installation Restoration Program
IS	internal standard
ISCP	Installation Spill Contingency Plan
IT	IT Corporation
ITEMS	IT Environmental Management System™
'J'	estimated concentration
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes
JPA	Joint Powers Authority
K	conductivity
K_d	soil-water distribution coefficient
kg	kilogram
KeV	kilo electron volt
K_{oc}	organic carbon partioning coefficient
K_{ow}	octonal-water partition coefficient
$KMnO_4$	potassium permanganate
L	liter; Lewisite (dichloro-[2-chloroethyl]sulfide)
L/kg/day	liters per kilogram per day
l	liter
LAW	light anti-tank weapon
lb	pound
LBP	lead-based paint
LC	liquid chromatography
LCS	laboratory control sample
LC_{50}	lethal concentration for 50 percent population tested
LD_{50}	lethal dose for 50 percent population tested
LEL	lower explosive limit
LOAEL	lowest-observed-advserse-effects-level
LOEC	lowest-observable-effect-concentration
LRA	land redevelopment authority
LT	less than the certified reporting limit
LUC	land-use control
LUCAP	land-use control assurance plan
LUCIP	land-use control implementation plan
max	maximum
MB	method blank
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MCPA	4-chloro-2-methylphenoxyacetic acid
MCPP	2-(2-methyl-4-chlorophenoxy)propionic acid
MCS	media cleanup standard
MD	matrix duplicate
MDC	maximum detected concentration
MDCC	maximum detected constituent concentration
MDL	method detection limit
mg	milligrams
mg/kg	milligrams per kilogram
mg/kg/day	milligram per kilogram per day
mg/kgbw/day	milligrams per kilogram of body weight per day
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils
MHz	megahertz
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µmhos/cm	micromhos per centimeter
MeV	mega electron volt
min	minimum
MINICAMS	miniature continuous air monitoring system
ml	inorganic silts and very fine sands
mL	milliliter
mm	millimeter
MM	mounded material
MMBtu/hr	million Btu per hour
MNA	monitored natural attenuation
MnO_4-	permanganate ion
MOA	Memorandum of Agreement
MOGAS	motor vehicle gasoline
MOUT	Military Operations in Urban Terrain
MP	Military Police
MPA	methyl phosphonic acid
MPC	maximum permissible concentration
MPM	most probable munition
MQL	method quantitation limit
MR	molasses residue
MRL	method reporting limit
MS	matrix spike
mS/cm	millisiemens per centimeter
mS/m	millisiemens per meter
MSD	matrix spike duplicate
MTBE	methyl tertiary butyl ether
msl	mean sea level
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded
mV	millivolts
MW	monitoring well
MWI&MP	Monitoring Well Installation and Management Plan
Na	sodium
NA	not applicable; not available
NAD	North American Datum
NAD83	North American Datum of 1983
$NaMnO_4$	sodium permanganate
NAVD88	North American Vertical Datum of 1988
NAS	National Academy of Sciences
NCEA	National Center for Environmental Assessment
NCP	National Contingency Plan
NCRP	National Council on Radiation Protection and Measurements
ND	not detected
NE	no evidence; northeast
ne	not evaluated
NEW	net explosive weight
NFA	No Further Action
NG	National Guard
NGP	National Guardsperson
ng/L	nanograms per liter
NGVD	National Geodetic Vertical Datum
Ni	nickel

NIC	notice of intended change
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NLM	National Library of Medicine
NO_3^-	nitrate
NOEC	no-observable-effect-concentration
NPDES	National Pollutant Discharge Elimination System
NPW	net present worth
No.	number
NOAA	National Oceanic and Atmospheric Administration
NOAEL	no-observed-adverse-effects-level
NR	not requested; not recorded; no risk
NRC	National Research Council
NRCC	National Research Council of Canada
NRHP	National Register of Historic Places
NRT	near real time
ns	nanosecond
N-S	north to south
NS	not surveyed
NSA	New South Associates, Inc.
nT	nanotesla
nT/m	nanoteslas per meter
NTU	nephelometric turbidity unit
nv	not validated
O_2	oxygen
O_3	ozone
O&G	oil and grease
O&M	operation and maintenance
OB/OD	open burning/open detonation
OD	outside diameter
OE	ordnance and explosives
oh	organic clays of medium to high plasticity
OH•	hydroxyl radical
ol	organic silts and organic silty clays of low plasticity
OP	organophosphorus
ORC	Oxygen Releasing Compound
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OVM-PID/FID	organic vapor meter-photoionization detector/flame ionization detector
OWS	oil/water separator
oz	ounce
PA	preliminary assessment
PAH	polynuclear aromatic hydrocarbon
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity
Parsons	Parsons Engineering Science, Inc.
Pb	lead
PBMS	performance-based measurement system
PC	permeability coefficient
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo-p-dioxins
PCDF	polychlorinated dibenzofurans
PCE	perchloroethene
PCP	pentachlorophenol
PDS	Personnel Decontamination Station
PEF	particulate emission factor
PEL	permissible exposure limit
PERA	preliminary ecological risk assessment
PERC	perchloroethene
PES	potential explosive site
Pest.	pesticides
PETN	pentaerythritoltetranitrate
PFT	portable flamethrower
PG	professional geologist
PID	photoionization detector
PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes
PM	project manager
POC	point of contact
POL	petroleum, oils, and lubricants
POTW	publicly owned treatment works
POW	prisoner of war
PP	peristaltic pump; Proposed Plan
ppb	parts per billion
ppbv	parts per billion by volume
PPE	personal protective equipment
ppm	parts per million
PPMP	Print Plant Motor Pool
ppt	parts per thousand
PR	potential risk
PRA	preliminary risk assessment
PRG	preliminary remediation goal
PS	chloropicrin
PSSC	potential site-specific chemical
pt	peat or other highly organic silts
PVC	polyvinyl chloride
QA	quality assurance
QA/QC	quality assurance/quality control
QAM	quality assurance manual
QAO	quality assurance officer
QAP	installation-wide quality assurance plan
QC	quality control
QST	QST Environmental, Inc.
qty	quantity
Qual	qualifier
R	rejected data; resample; retardation factor
R&A	relevant and appropriate
RA	remedial action
RAO	remedial action objective
RBC	risk-based concentration; red blood cell
RBRG	risk-based remedial goal
RCRA	Resource Conservation and Recovery Act
RCWM	Recovered Chemical Warfare Material
RD	remedial design
RDX	cyclotrimethylenetrinitramine
ReB3	Rarden silty clay loams
REG	regular field sample
REL	recommended exposure limit
RFA	request for analysis
RfC	reference concentration
RfD	reference dose
RGO	remedial goal option
RI	remedial investigation
RL	reporting limit
RME	reasonable maximum exposure
ROD	Record of Decision
RPD	relative percent difference
RR	range residue
RRF	relative response factor
RRSE	Relative Risk Site Evaluation
RSD	relative standard deviation
RTC	Recruiting Training Center
RTECS	Registry of Toxic Effects of Chemical Substances
RTK	real-time kinematic
RWIMR	Ranges West of Iron Mountain Road
SA	exposed skin surface area
SAD	South Atlantic Division
SAE	Society of Automotive Engineers
SAIC	Science Applications International Corporation
SAP	installation-wide sampling and analysis plan
SARA	Superfund Amendments and Reauthorization Act
sc	clayey sands; sand-clay mixtures
Sch.	schedule
SCM	site conceptual model
SD	sediment
SDG	sample delivery group
SDWA	Safe Drinking Water Act
SDZ	safe distance zone; surface danger zone
SEMS	Southern Environmental Management & Specialties, Inc.
SF	cancer slope factor
SFSP	site-specific field sampling plan
SGF	standard grade fuels
Shaw	Shaw Environmental, Inc.
SHP	installation-wide safety and health plan
SI	site investigation

List of Abbreviations and Acronyms *(Continued)*

SINA	Special Interest Natural Area
SL	standing liquid
SLERA	screening-level ecological risk assessment
sm	silty sands; sand-silt mixtures
SM	Serratia marcescens
SMDP	Scientific Management Decision Point
s/n	signal-to-noise ratio
SO_4^{-2}	sulfate
SOD	soil oxidant demand
SOP	standard operating procedure
SOPQAM	U.S. EPA's *Standard Operating Procedure/Quality Assurance Manual*
sp	poorly graded sands; gravelly sands
SP	submersible pump
SPCC	system performance calibration compound
SPCS	State Plane Coordinate System
SPM	sample planning module
SQRT	screening quick reference tables
Sr-90	strontium-90
SRA	streamlined human health risk assessment
SRI	supplemental remedial investigation
SRM	standard reference material
Ss	stony rough land, sandstone series
SS	surface soil
SSC	site-specific chemical
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
SSL	soil screening level
SSSL	site-specific screening level
SSSSL	site-specific soil screening level
STB	supertropical bleach
STC	source-term concentration
STD	standard deviation
STEL	short-term exposure limit
STL	Severn-Trent Laboratories
STOLS	Surface Towed Ordnance Locator System®
Std. units	standard units
SU	standard unit
SUXOS	senior UXO supervisor
SVOC	semivolatile organic compound
SW	surface water
SW-846	U.S. EPA's *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*
SWMU	solid waste management unit
SWPP	storm water pollution prevention plan
SZ	support zone
TAL	target analyte list
TAT	turn around time
TB	trip blank
TBC	to be considered
TCA	trichloroethane
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzofurans
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDEC	Tennessee Department of Environment and Conservation
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TEA	triethylaluminum
Tetryl	trinitrophenylmethylnitramine
TERC	Total Environmental Restoration Contract
THI	target hazard index
TIC	tentatively identified compound
TLV	threshold limit value
TN	Tennessee
TNB	trinitrobenzene
TNT	trinitrotoluene
TOC	top of casing; total organic carbon
TPH	total petroleum hydrocarbons
TR	target cancer risk
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TRV	toxicity reference value
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
TWA	time-weighted average
UCL	upper confidence limit
UCR	upper certified range
'U'	not detected above reporting limit
UIC	underground injection control
UF	uncertainty factor
URF	unit risk factor
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USACMLS	U.S. Army Chemical School
USAMPS	U.S. Army Military Police School
USATCES	U.S. Army Technical Center for Explosive Safety
USATEU	U.S. Army Technical Escort Unit
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USC	United States Code
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UTL	upper tolerance level; upper tolerance limit
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Supervisor
UXOSO	UXO safety officer
V	vanadium
VC	vinyl chloride
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQlfr	validation qualifier
VQual	validation qualifier
VX	nerve agent (O-ethyl-S-[diisopropylaminoethyl]-methylphosphonothiolate)
WAC	Women's Army Corps
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WRS	Wilcoxon rank sum
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd^3	cubic yards

TABLES

Table 1

Sampling Locations and Rationale
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
OWH-205-MW01	Groundwater	A groundwater sample was collected from existing monitoring well OWH-205-MW01 (formerly OWH-G01) to confirm analytical results from previous investigations.
OWH-205-MW02	Groundwater	A groundwater sample was collected from existing monitoring well OWH-205-MW02 (formerly OWH-G02) to confirm analytical results from previous investigations.
OWH-205-MW03	Groundwater	A groundwater sample was collected from existing monitoring well OWH-205-MW03 (formerly OWH-G03) to confirm analytical results from previous investigations.
OWH-205-MW04	Groundwater	A groundwater sample was collected from existing monitoring well OWH-205-MW04 (formerly OWH-G04) to confirm analytical results from previous investigations.
OWH-205-MW05	Groundwater	A groundwater sample was collected from existing monitoring well OWH-205-MW05 (formerly OWH-G05) to confirm analytical results from previous investigations.
OWH-205-MW06	Groundwater	A groundwater sample was collected from a bedrock monitoring well installed adjacent to existing residuum well OWH-205-MW01 (formerly OWH-G01) to determine the presence or absence of potential site-specific chemicals.
OWH-205-MW07	Groundwater	A groundwater sample was collected from a bedrock monitoring well installed adjacent to existing residuum well OWH-205-MW05 (formerly OWH-G05) to determine the presence or absence of potential site-specific chemicals.
OWH-205-MW08	Groundwater	A groundwater sample was collected from a residuum monitoring well installed adjacent to existing residuum well OWH-205-MW02 (formerly OWH-G02) to determine the presence or absence of potential site-specific chemicals.
OWH-205-MW09	Groundwater	A groundwater sample was collected from a residuum monitoring well installed approximately 100 feet south (downgradient) of the Old Water Hole to determine the presence or absence of potential site-specific chemicals.
OWH-205-GP01	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected from a boring located approximately 30 feet northeast of the Old Water Hole. The boring was placed at a potential source location based on existing geophysical survey data. Sample data were used to determine if contaminant releases have occurred in this area and if contaminated soil exists at this site.
OWH-205-GP02	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected from a boring located near the northern berm of the Old Water Hole. The boring was placed at a potential source location based on existing geophysical survey data. Sample data were used to determine if contaminant releases have occurred in this area and if contaminated soil exists at this site.

Table 1

Sampling Locations and Rationale
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Media	Sample Location Rationale
OWH-205-GP03	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected from a boring placed near a potential source area downslope of well OWH-205-MW02. Sample data were used to determine if contaminant releases in this area have occurred, and to determine if contaminated soil exists at this site.
OWH-205-GP04	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected from a boring located approximately 100 feet northeast of the Old Water Hole to determine if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site.
OWH-205-GP05	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected from a boring located approximately 100 feet east of the Old Water Hole to determine if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site.
OWH-205-GP06	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected from a boring located approximately 200 feet southwest of the Old Water Hole to determine if contaminant releases into the environment have occurred from use of this area and if contaminated soil exists at this site.

Table 2

Monitoring Well Construction Summary
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Well Location	Well Type[a]	Northing	Easting	Ground Elevation (ft amsl)	TOC Elevation (ft amsl)	Well Depth (ft bgs)	Screen Length (ft)	Screen Interval (ft bgs)	Well Material
OWH-205-MW01	Residuum	1179697.03	628482.96	657.73	659.32	107.4	20	87 - 107	4" ID Sch. 80 PVC
OWH-205-MW02	Residuum	1179338.23	628254.20	660.11	661.85	104	10	90 - 100	4" ID Sch. 80 PVC
OWH-205-MW03	Residuum	1179204.35	628611.38	654.53	655.92	75	10	58 - 68	4" ID Sch. 80 PVC
OWH-205-MW04	Residuum	1179480.36	628485.85	654.56	656.20	98.5	10	88 - 98	4" ID Sch. 80 PVC
OWH-205-MW05	Residuum	1179566.59	628603.48	661.97	663.34	93.7	10	82 - 92	4" ID Sch. 80 PVC
OWH-205-MW06	Bedrock	1179698.92	628463.93	657.08	659.12	150	20	129.8 - 149.8	4" ID Sch. 80 PVC
OWH-205-MW07	Bedrock	1179552.55	628614.47	661.71	663.88	150.2	20	129.3 - 149.3	4" ID Sch. 80 PVC
OWH-205-MW08	Residuum	1179347.30	628235.89	660.92	663.10	140.8	10	130.8 - 140.8	4" ID Sch. 80 PVC
OWH-205-MW09	Residuum	1179260.51	628409.60	655.61	657.61	151	20	130.6 - 150.6	4" ID Sch. 80 PVC

[a] Monitoring wells OWH-205-MW01 through OWH-205-MW05 were installed by SAIC in 1995 using hollow-stem auger drilling.
Monitoring wells OWH-205-MW06 through OWH-205-MW09 were installed by Shaw using hollow-stem auger and air-rotary drilling.

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983.
Elevations referenced to the North American Vertical Datum of 1988.

4" ID Sch. 80 PVC - 4-inch inside diameter, Schedule 80, polyvinyl chloride.
amsl - Above mean sea level.
bgs - Below ground surface.
ft - Feet

Table 3

Groundwater Field Parameters
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Date	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Temperature (°C)	Turbidity (NTU)	pH (SU)
OWH-205-MW01	29-Oct-02	0.286	3.19	94	23.2	5.3	9.47
	3-Sep-03	0.307	3.75	-69.1	17.1	5.0	10.38
OWH-205-MW02	31-Oct-02	0.239	10.90	246	15.3	36	5.88
	28-Aug-03	0.180	5.95	62.1	19.9	11.2	7.53
OWH-205-MW03	2-Nov-02	0.031	8.32	358	15.9	12	5.65
	27-Aug-03	0.054	3.08	182.5	19.9	10	5.32
OWH-205-MW04	31-Oct-02	0.371	6.92	102	15.6	5.1	10.69
	9-Sep-03	0.249	1.36	-3.9	17.5	7.0	10.13
OWH-205-MW05	1-Nov-02	0.200	5.41	73	20.4	7.65	9.76
	2-Sep-03	0.206	6.15	-30.4	18.6	4.0	9.57
OWH-205-MW06	31-Oct-02	0.402	6.28	107	16.4	9.1	8.11
	4-Sep-03	0.472	4.31	-26.1	22.7	16.8	9.33
OWH-205-MW07	31-Oct-02	0.219	5.22	101	19.8	1.94	8.13
	10-Sep-03	0.215	5.65	89.9	18.9	6.6	8.10
OWH-205-MW08	29-Oct-02	0.280	7.60	277	19.8	15	7.95
	28-Aug-03	0.297	4.94	47.8	17.9	19	7.44
OWH-205-MW09	8-Nov-02	0.279	1.88	277	16.7	9.5	7.95
	29-Aug-03	0.319	3.95	278	19.1	13.3	7.93

°C - Degrees Celsius.
mg/L - Milligrams per liter.
mS/cm - Millisiemens per centimeter.
mV - Millivolts.
NTU - Nephelometric turbidity units.
ORP - Oxidation-reduction potential.
SU - Standard units.

Table 4

Groundwater Elevations
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Well Location	Date	Depth to Water (ft BTOC)	Top of Casing Elevation (ft amsl)	Ground Elevation (ft amsl)	Groundwater Elevation (ft amsl)
OWH-205-MW01	10-Apr-03	39.70	659.32	657.73	619.62
OWH-205-MW02	10-Apr-03	46.38	661.85	660.11	615.47
OWH-205-MW03	10-Apr-03	30.81	655.92	654.53	625.11
OWH-205-MW04	10-Apr-03	38.01	656.20	654.56	618.19
OWH-205-MW05	10-Apr-03	43.52	663.34	661.97	619.82
OWH-205-MW06	10-Apr-03	40.63	659.12	657.08	618.49
OWH-205-MW07	10-Apr-03	45.10	663.88	661.71	618.78
OWH-205-MW08	10-Apr-03	50.08	663.10	660.92	613.02
OWH-205-MW09	10-Apr-03	42.91	657.61	655.61	614.70

Elevations referenced to the North American Vertical Datum of 1988.

amsl - Above mean sea level.
BTOC - Below top of casing.
ft - Feet.

Table 5

Survey Data
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
OWH-205-GP01	1179566.90	628453.32	657.65	NA
OWH-205-GP02	1179534.84	628388.97	659.46	NA
OWH-205-GP03	1179386.28	628195.84	671.62	NA
OWH-205-GP04	1179611.74	628515.48	656.80	NA
OWH-205-GP05	1179399.72	628597.93	657.13	NA
OWH-205-GP06	1179273.98	628195.46	666.80	NA
OWH-205-MW01	1179697.03	628482.96	657.73	659.32
OWH-205-MW02	1179338.23	628254.20	660.11	661.85
OWH-205-MW03	1179204.35	628611.38	654.53	655.92
OWH-205-MW04	1179480.36	628485.85	654.56	656.20
OWH-205-MW05	1179566.59	628603.48	661.97	663.34
OWH-205-MW06	1179698.92	628463.93	657.08	659.12
OWH-205-MW07	1179552.55	628614.47	661.71	663.88
OWH-205-MW08	1179347.30	628235.89	660.92	663.10
OWH-205-MW09	1179260.51	628409.60	655.61	657.61

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983.

Elevations referenced to the North American Vertical Datum of 1988.

ft amsl - Feet above mean sea level
NA - Not applicable.

Table 6

Surface Soil Analytical Results
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location					OWH-205-GP01					OWH-205-GP02					OWH-205-GP03				
Sample Number					MK0008					MK0010					MK0012				
Sample Date					29-Aug-02					29-Aug-02					28-Aug-02				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	6.01E+03				YES	5.59E+03				YES	6.70E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	1.89E+00			YES		1.24E+00			YES		1.61E+01		YES	YES	YES
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	7.16E+01					2.60E+01					5.00E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	1.31E+03					9.46E+01	J				2.88E+02				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	5.58E+00				YES	5.14E+00				YES	1.26E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	ND					ND					2.24E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	5.58E+00					1.64E+01		YES			9.01E+00				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	4.33E+03			YES	YES	3.05E+03			YES	YES	1.39E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.25E+01					1.09E+01					6.82E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	8.14E+02					1.95E+02					2.71E+02				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	2.91E+01					1.64E+01					2.43E+02				YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	3.73E-02	J				2.81E-02	J				6.35E-02	J			
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	9.99E-01	B				9.69E-01	B				2.52E+00	B			
Potassium	mg/kg	8.00E+02	NA	NA	9.44E+01	J				1.58E+02	J				3.13E+02	J			
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					ND					8.60E-01	B	YES		YES
Sodium	mg/kg	6.34E+02	NA	NA	2.92E+01	J				2.37E+01	J				2.13E+01	J			
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	9.93E+00				YES	1.02E+01				YES	2.28E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	2.40E+01	J				1.35E+01	J				1.29E+01	J			
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.40E-01	J				6.90E-02	B				4.70E-02	B			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.90E-03	B				ND					3.20E-03	B			
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					4.30E-03	J				ND				

Table 6

Surface Soil Analytical Results
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location					OWH-205-GP04					OWH-205-GP05					OWH-205-GP06				
Sample Number					MK0001					MK0003					MK0005				
Sample Date					29-Aug-02					28-Aug-02					28-Aug-02				
Parameter	Units	BKG[a]	SSSL[b]	ESV[b]	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	6.99E+03				YES	1.21E+04			YES	YES	7.18E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	2.37E+00			YES		1.08E+01			YES	YES	8.56E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	2.25E+01					1.16E+01					7.16E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					ND					4.34E-01	J			
Calcium	mg/kg	1.72E+03	NA	NA	5.72E+01	J				1.02E+02	J				4.71E+02				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.00E+01				YES	4.35E+01		YES	YES	YES	1.05E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	ND					ND					3.48E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	2.64E+00					7.72E+00					2.82E+01		YES		
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	6.44E+03			YES	YES	3.45E+04		YES	YES	YES	1.42E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	8.85E+00					8.60E+00					3.88E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	1.92E+02					1.92E+02					2.65E+02				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	3.01E+01					4.34E+01					7.12E+02			YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					5.89E-02	J				4.04E-02	J			
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	1.13E+00	B				1.58E+00	J				3.52E+00	B			
Potassium	mg/kg	8.00E+02	NA	NA	ND					1.45E+02	J				1.26E+02	J			
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					2.35E+00		YES		YES	9.60E-01	B	YES		YES
Sodium	mg/kg	6.34E+02	NA	NA	2.31E+01	J				2.46E+01	J				2.85E+01	J			
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.46E+01				YES	5.10E+01				YES	1.97E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	8.36E+00	J				7.97E+00	J				4.58E+01	J	YES		
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.40E-01	J				7.00E-02	B				2.30E-01	J			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.70E-03	B				2.70E-03	B				2.10E-03	B			
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	9.60E-03					ND					ND				

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

[a] BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

[b] Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 7

Subsurface Soil Analytical Results
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location				OWH-205-GP01				OWH-205-GP02				OWH-205-GP03			
Sample Number				MK0009				MK0011				MK0013			
Sample Date				29-Aug-02				29-Aug-02				28-Aug-02			
Sample Depth (Feet)				11 - 12				11 - 12				9 - 10			
Parameter	**Units**	**BKG[a]**	**SSSL[b]**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**	**Result**	**Qual**	**>BKG**	**>SSSL**
METALS															
Aluminum	mg/kg	1.36E+04	7.80E+03	1.16E+04			YES	6.44E+03				1.06E+04			YES
Arsenic	mg/kg	1.83E+01	4.26E-01	3.06E-01	J			6.58E-01	J		YES	3.78E+01		YES	YES
Barium	mg/kg	2.34E+02	5.47E+02	1.58E+01				1.04E+01				6.82E+00			
Calcium	mg/kg	6.37E+02	NA	3.59E+01	J			3.15E+01	J			5.95E+01	J		
Chromium	mg/kg	3.83E+01	2.32E+01	1.19E+01				7.07E+00				2.10E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	ND				ND				3.88E+00			
Copper	mg/kg	1.94E+01	3.13E+02	5.49E+00				2.64E+00				2.31E+01		YES	
Iron	mg/kg	4.48E+04	2.34E+03	1.22E+03				9.73E+02				2.56E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	5.71E+00				3.18E+00				7.89E+00			
Magnesium	mg/kg	7.66E+02	NA	2.89E+02				1.33E+02				5.78E+02			
Manganese	mg/kg	1.36E+03	3.63E+02	7.01E+00				3.34E+00				2.98E+01			
Mercury	mg/kg	7.00E-02	2.33E+00	4.78E-02	J			ND				5.73E-02	J		
Nickel	mg/kg	1.29E+01	1.54E+02	1.96E+00	B			1.22E+00	B			8.70E+00			
Potassium	mg/kg	7.11E+02	NA	2.04E+02	J			ND				1.01E+03		YES	
Selenium	mg/kg	4.70E-01	3.91E+01	ND				ND				1.58E+00		YES	
Sodium	mg/kg	7.02E+02	NA	3.36E+01	J			2.74E+01	J			2.78E+01	J		
Vanadium	mg/kg	6.49E+01	5.31E+01	1.04E+01				1.85E+01				4.47E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	1.01E+01	J			5.65E+00	J			3.02E+01	J		
VOLATILE ORGANIC COMPOUNDS															
Methylene chloride	mg/kg	NA	8.41E+01	3.10E-03	B			2.00E-03	B			4.00E-03	B		

Table 7

Subsurface Soil Analytical Results
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location				OWH-205-GP04				OWH-205-GP05				OWH-205-GP06			
Sample Number				MK0002				MK0004				MK0007			
Sample Date				29-Aug-02				28-Aug-02				28-Aug-02			
Sample Depth (Feet)				11 - 12				11 - 12				4 - 5			
Parameter	Units	BKG[a]	SSSL[b]	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS															
Aluminum	mg/kg	1.36E+04	7.80E+03	1.01E+04			YES	7.29E+03				7.02E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	8.27E-01	J		YES	3.51E+00			YES	1.01E+01			YES
Barium	mg/kg	2.34E+02	5.47E+02	1.37E+01				5.93E+00				2.86E+01			
Calcium	mg/kg	6.37E+02	NA	4.36E+01	J			4.23E+01	J			2.20E+02			
Chromium	mg/kg	3.83E+01	2.32E+01	1.55E+01				5.30E+00				9.55E+00			
Cobalt	mg/kg	1.75E+01	4.68E+02	ND				ND				1.95E+00	J		
Copper	mg/kg	1.94E+01	3.13E+02	4.73E+00				4.88E+00				6.48E+00			
Iron	mg/kg	4.48E+04	2.34E+03	3.28E+03			YES	7.44E+03			YES	1.02E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	7.03E+00				3.81E+00				8.93E+00			
Magnesium	mg/kg	7.66E+02	NA	2.25E+02				1.48E+02				2.68E+02			
Manganese	mg/kg	1.36E+03	3.63E+02	5.71E+00				8.94E+00				2.44E+02			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	1.44E+00	B			ND				2.40E+00	B		
Potassium	mg/kg	7.11E+02	NA	2.30E+02	J			1.54E+02	J			1.68E+02	J		
Selenium	mg/kg	4.70E-01	3.91E+01	ND				ND				5.73E-01	B	YES	
Sodium	mg/kg	7.02E+02	NA	3.34E+01	J			3.25E+01	J			2.47E+01	J		
Vanadium	mg/kg	6.49E+01	5.31E+01	2.46E+01				1.48E+01				1.72E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	1.03E+01	J			6.36E+00	J			2.07E+01	J		
VOLATILE ORGANIC COMPOUNDS															
Methylene chloride	mg/kg	NA	8.41E+01	3.00E-03	B			3.70E-03	B			4.20E-03	B		

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

[a] BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

[b] Residential human health site-specific screening level (SSSL) as given in IT, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 8

Groundwater Analytical Results
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location				OWH-205-MW01				OWH-205-MW02				OWH-205-MW03				OWH-205-MW04				OWH-205-MW05			
Sample Number				MK3001				MK3002				MK3003				MK3004				MK3005			
Sample Date				29-Oct-02				31-Oct-02				2-Nov-02				31-Oct-02				1-Nov-02			
Parameter	Units	BKG[a]	SSSL[b]	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																							
Aluminum	mg/L	2.34E+00	1.56E+00	2.24E-01				9.78E-01				ND				2.75E-01				3.14E-01			
Arsenic	mg/L	1.78E-02	4.40E-05	2.04E-03	J		YES	ND				2.77E-03	J		YES	5.13E-03	J		YES	6.89E-03	J		YES
Barium	mg/L	1.27E-01	1.10E-01	1.61E-02	B			2.36E-02				8.37E-03	B			5.86E-02				1.46E-02	B		
Calcium	mg/L	5.65E+01	NA	1.63E+01	B			9.98E+00	B			6.77E-01	B			1.09E+01	B			1.72E+01	B		
Chromium	mg/L	NA	4.69E-03	8.88E-03	J		YES	ND				ND				ND				ND			
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				ND				1.59E-02	J			ND			
Iron	mg/L	7.04E+00	4.69E-01	6.98E-02	J			4.59E-01	J			7.51E-03	J			7.64E-03	J			8.82E-02	J		
Magnesium	mg/L	2.13E+01	NA	1.71E+01	B			3.23E+00	B			2.04E-01	B			1.45E+00	B			6.09E+00	B		
Manganese	mg/L	5.81E-01	7.35E-02	7.27E-02	J			2.64E-02	J			4.68E-03	J			3.40E-01			YES	3.86E-03	J		
Nickel	mg/L	NA	3.13E-02	1.77E-02	J			ND				ND				ND				ND			
Potassium	mg/L	7.20E+00	NA	2.09E+01		YES		2.54E+00	B			3.46E+00	B			2.67E+01		YES		1.74E+01		YES	
Selenium	mg/L	NA	7.82E-03	ND				ND				ND				ND				ND			
Sodium	mg/L	1.48E+01	NA	2.24E+01		YES		5.77E+00	B			3.90E+00	B			1.66E+01		YES		4.45E+00	B		
Thallium	mg/L	1.46E-03	1.01E-04	ND				ND				ND				ND				ND			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				ND				ND				1.66E-02	J		YES	7.87E-03	J		
VOLATILE ORGANIC COMPOUNDS																							
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				ND				ND			
Methylene chloride	mg/L	NA	7.85E-03	ND				ND				2.50E-04	B			ND				2.00E-04	B		
CWM BREAKDOWN PRODUCTS																							
Methylphosphonic Acid	mg/L	NA	1.25E-01	ND				ND				ND				2.40E-02	J			ND			

Table 8

Groundwater Analytical Results
Old Water Hole, Parcel 205(7)
Fort McClellan, Calhoun County, Alabama

Sample Location				OWH-205-MW06				OWH-205-MW07				OWH-205-MW08				OWH-205-MW09			
Sample Number				MK3006				MK3007				MK3009				MK3010			
Sample Date				31-Oct-02				31-Oct-02				29-Oct-02				8-Nov-02			
Parameter	Units	BKG[a]	SSSL[b]	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	1.74E-01	J			6.93E-02	J			2.03E-01				1.03E-01	J		
Arsenic	mg/L	1.78E-02	4.40E-05	2.31E-03	J		YES	ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	7.67E-03	B			3.86E-03	B			7.46E-03	B			1.98E-02	B		
Calcium	mg/L	5.65E+01	NA	3.18E+01				2.30E+01	B			3.34E+01				3.76E+01	B		
Chromium	mg/L	NA	4.69E-03	ND				1.53E-02	J		YES	ND				ND			
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	1.07E-01	J			8.38E-02	J			1.91E-01	J			1.29E-01	B		
Magnesium	mg/L	2.13E+01	NA	1.60E+01	B			1.36E+01	B			1.99E+01	B			2.17E+01	B	YES	
Manganese	mg/L	5.81E-01	7.35E-02	3.86E-03	J			5.67E-03	J			1.20E-02	J			3.27E-02	J		
Nickel	mg/L	NA	3.13E-02	ND				ND				ND				ND			
Potassium	mg/L	7.20E+00	NA	2.28E+00	B			2.17E+00	B			1.73E+00	B			6.69E+00			
Selenium	mg/L	NA	7.82E-03	3.17E-03	J			ND				ND				ND			
Sodium	mg/L	1.48E+01	NA	1.46E+01				2.27E+00	B			1.78E+00	B			6.88E+00	B		
Thallium	mg/L	1.46E-03	1.01E-04	8.96E-03	B	YES	YES	ND				ND				ND			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				ND				ND				ND			
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				2.10E-02	J		
Methylene chloride	mg/L	NA	7.85E-03	ND				ND				ND				ND			
CWM BREAKDOWN PRODUCTS																			
Methylphosphonic Acid	mg/L	NA	1.25E-01	ND				ND				ND				ND			

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

[a] BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama* , July.

[b] Residential human health site-specific screening level (SSSL) as given in IT, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama* , July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

CWM - Chemical warfare material.

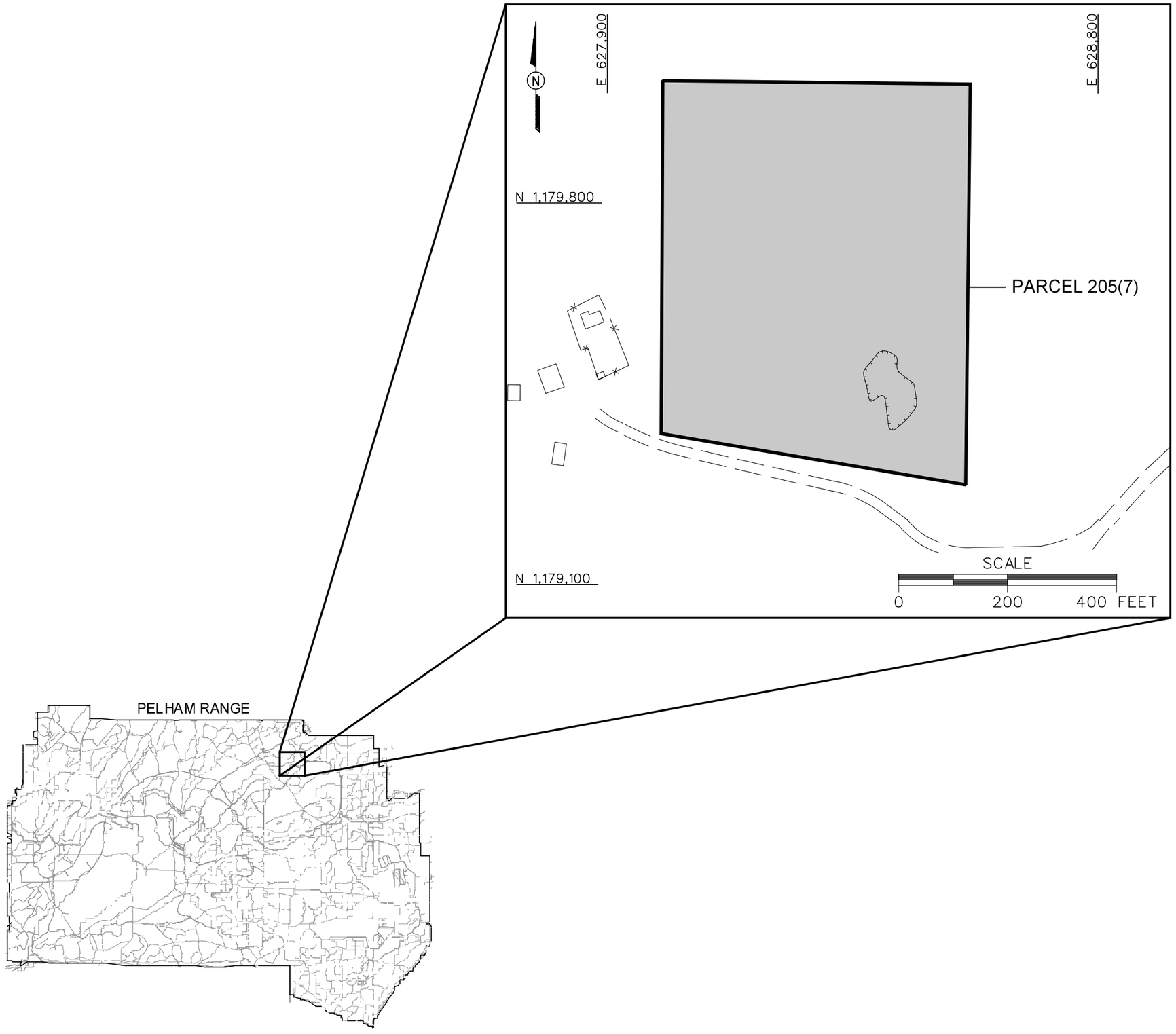
mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

FIGURES



LEGEND

- UNIMPROVED ROAD
- BUILDING
- PARCEL BOUNDARY
- FENCE
- DEPRESSION

FIGURE 1
SITE LOCATION MAP
OLD WATER HOLE
PARCEL 205(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

Shaw™ Shaw Environmental, Inc.

DWG. NO.: ...\774645aa.002 | PROJ. NO.: 774645
INITIATOR: N. BADON | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: S. MORAN
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 04/17/03 | DRAWN BY: D. BOMAR
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DWG. NO.: ...\774645aa.003 | PROJ. NO.: 774645
INITIATOR: N. BADON | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: S. MORAN
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 04/17/03 | DRAWN BY: D. BOMAR
4/21/2004 2:38:50 PM
lstout
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N 1,180,000
E 627,900
E 628,900
N 1,179,200

725 725 700 675 700 650 700 700 675 675

OWH-205-MW06
OWH-205-MW01
PARCEL 205(7)
OWH-205-GP04
A'
OWH-205-GP01
OWH-205-MW05
OWH-205-MW07
OWH-205-GP02
OWH-205-MW04
OWH-205-GP05
OWH-205-GP03
OWH-205-MW08
A
OWH-205-MW02
OWH-205-GP06
OWH-205-MW09
OWH-205-MW03

LEGEND

- UNIMPROVED ROAD
- BUILDING
- TOPOGRAPHIC CONTOUR (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- PARCEL BOUNDARY
- FENCE
- DEPRESSION
- EXISTING RESIDUUM MONITORING WELL LOCATION (SAIC, 1995)
- RESIDUUM MONITORING WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- A A' CROSS SECTION LOCATION

SCALE
0 100 200 FEET

FIGURE 2
SAMPLE LOCATION MAP
OLD WATER HOLE
PARCEL 205(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

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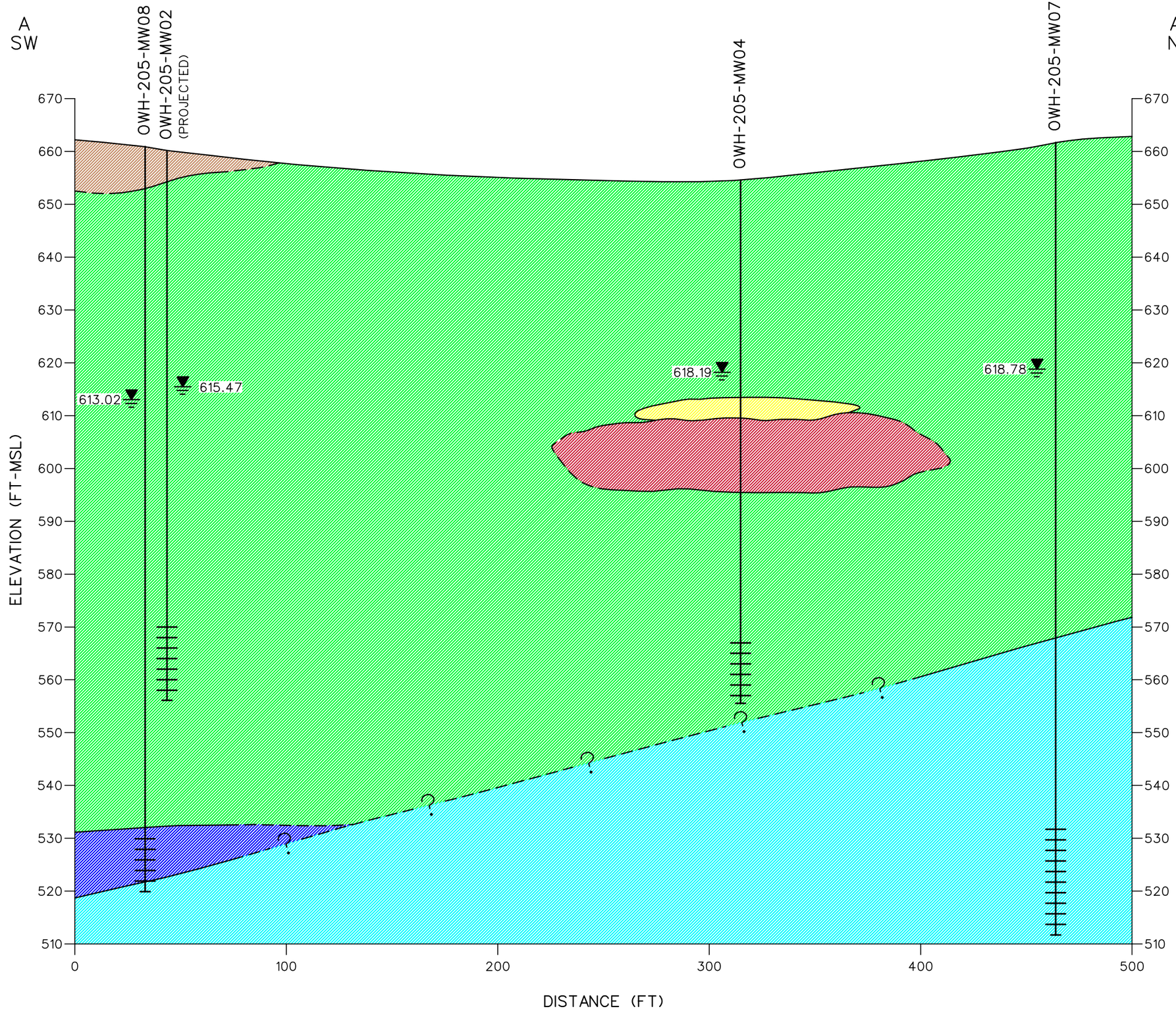

LEGEND

- SCREEN INTERVAL
- WATER TABLE
- 613.02 GROUNDWATER ELEVATION (FT MSL)
- CONTACT DASHED WHERE INFERRED
- SAND
- SILT
- SILT WITH CLAY
- SILTY/SANDY CLAY WITH CHERT AND SANDSTONE GRAVEL
- DOLOMITE
- WEATHERED DOLOMITE

NOTES:

1. ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
2. CROSS SECTION LOCATION SHOWN ON FIGURE 2.

HORIZONTAL
0 50 100 FEET

VERTICAL
0 20 40 FEET

FIGURE 3
GEOLOGIC CROSS SECTION A-A'
OLD WATER HOLE
PARCEL 205(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

Shaw Environmental, Inc.

DWG. NO.: 774645aa.021 | PROJ. NO.: 774645
INITIATOR: L. O'HARE | PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY: | ENGR. CHCK. BY: S. MORAN
DATE LAST REV.: | DRAWN BY:
STARTING DATE: 05/21/03 | DRAWN BY: D. BOMAR
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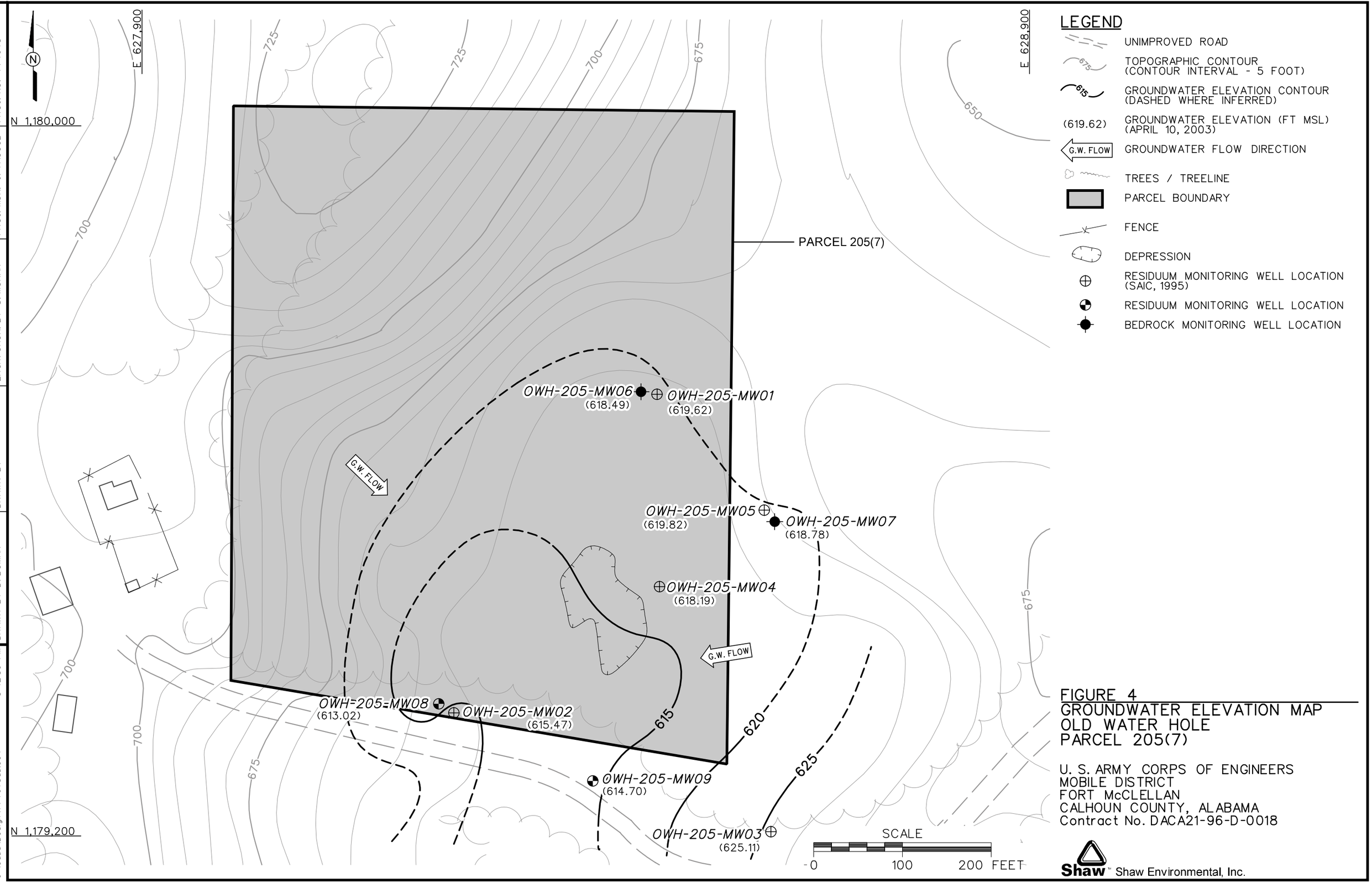

FIGURE 4
GROUNDWATER ELEVATION MAP
OLD WATER HOLE
PARCEL 205(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

Shaw Environmental, Inc.

DWG. NO.:...\774645aa.004
PROJ. NO.: 774645
INITIATOR: N. BADON
PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY:
ENGR. CHCK. BY: S. MORAN
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 04/15/03
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4/21/2004
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