



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

 ENTERED

APR 08 2013

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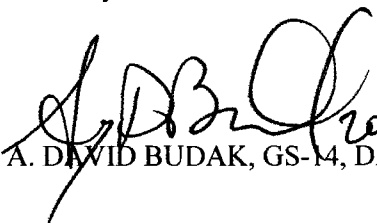
Dear Mr. Kieling

Holloman Air Force Base is pleased to submit the Final SD-08 Long Term Monitoring Report, Quarter 5, Winter 2013 for your review.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Ms. DeAnna Rothhaupt of our Asset Management Flight at (575) 572-3931.

Sincerely


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**FINAL
SD-08 LONG TERM MONITORING REPORT
QUARTER 5, WINTER 2013
HOLLOMAN AIR FORCE BASE, NEW MEXICO**

Prepared For:

**49 CES/CEAN
Holloman Air Force Base
New Mexico**

Under Contract to:



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FINAL
SD-08 LONG TERM MONITORING REPORT
QUARTER 5, WINTER 2013
HOLLOMAN AIR FORCE BASE, NEW MEXICO

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- Attachment 1 – New Mexico Environmental Department, Notice of Approval, Request to Perform Eight Quarters of Groundwater Monitoring, Site SD-08 (SWMU 82) HAFB, EPA ID# NM6572124422, HWB-HAFB-07-007, November 22, 2011

Appendices

- Appendix A – Portions of the *Draft Final Site Investigation Report Waste Sites SS-06, SD-15, AOC-RR, and AOC-BBMS Holloman Air Force Base, New Mexico* (Ebasco Services Inc. and Groundwater Technology Government Services Inc. [GTI], October 1995)
- Appendix B - Depth to Water Field Form
- Appendix C - Groundwater Sampling Field Forms
- Appendix D - Laboratory Analytical Results (Provided on Enclosed CD)
- Appendix E – Data Validation Report
- Appendix F - Daily Quality Control Reports

ACRONYMS

amsl	above mean sea level
AOC	Area of Concern
Bhate	Bhate Environmental Associates Inc.
COC	Contaminants of Concern
1,2-DCA	1,2 dichlorethane
1,2-DCP	1,2 dichloropropane
DQCR	Daily Quality Control Reports
EBASCO	Electric Bond and Share Company
ERP	Environmental Restoration Program
ft	Feet or foot
ft ²	Square feet
FS/CMS	Feasibility Study/Corrective Measures Study
GCAL	Gulf Coast Analytical Laboratories
GPS	Global Positioning System
GTI	Groundwater Technology Government Services Inc.
HAFB	Holloman Air Force Base
IDW	Investigative Derived Wate
IRP	Installation Restoration Program
J	Laboratory Qualifier denoting an estimated result
LTM	Long Term Monitoring
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
µg/L	Micrograms per liter
mg/L	Milligrams per liter
NAVD	North American Vertical Datum
NationView	Nation View, LLC
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
O/WS	Oil Water Separator
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Recovery and Conservation Act
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RPD	Relative Percent Difference
SOP	Standard Operating Procedure
SOW	Scope of Work
SWMU	Solid Waste Management Unit

TAL	Target Analyte List
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
U	Laboratory Qualifier denoting a non-detect result
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UTL	Upper Tolerance Limit
VOC	Volatile Organic Compound
WGS	World Geodetic System
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

This Long Term Monitoring (LTM) Quarterly Report documents the fifth quarterly (Winter 2013) groundwater sampling field event at Environmental Restoration Program (ERP) Site SD-08 (Solid Waste Management Unit [SWMU] 82 – Building 131 Washrack) at Holloman Air Force Base (HAFB), New Mexico. NationView LLC (NationView) conducted this sampling event under contract W9128F-09-D-0055, Task Order No. 0003 for the United States Army Corps of Engineers (USACE), Omaha District.

The primary objectives of the SD-08 LTM quarterly groundwater sampling events are based on recommendations provided by the USACE Omaha Statement of Work (SOW) dated March 2, 2010 (USACE, 2010). The LTM objectives are based on the findings presented in the *Final RCRA Facility Investigation Report, Building 131 Washrack, Site SD-08, Holloman AFB, New Mexico* (Bhate Environmental Associates, Inc. [Bhate], 2007). Additionally, on November 22, 2011, the New Mexico Environment Department (NMED) approved HAFB's request to perform two years of quarterly groundwater monitoring at Site SD-08 (NMED, 2011a). The NMED Notice of Approval letter, *Request to Perform Eight Quarters of Groundwater Monitoring, Site SD-08* (NMED, 2011a) is provided as Attachment 1. Specifically, the project objectives are to conduct a quarterly monitoring program for two years in order to determine if natural attenuation is degrading the primary contaminants of concern (COCs) (1,2-dichloroethane [1,2-DCA], 1,2 dichloropropane [1,2-DCP], manganese, and arsenic) previously identified in monitoring wells MW-08-01, MW-08-03, and MW-08-07 during the 2006 Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI) groundwater sampling event.

1.1 Report Organization

This Quarterly Report is organized into the following eight sections:

- Section 1 – Introduction
- Section 2 – Site Background
- Section 3 – Applicable Screening Criteria
- Section 4 – Groundwater Sampling Field Activities
- Section 5 – Groundwater Analytical Results
- Section 6 – Comparison of the January 2013 Analytical Results to Previous SD-08 LTM Results
- Section 7 – Conclusions and Recommendations
- Section 8 – References

The figures, tables, attachments and appendices referenced throughout this Quarterly Report are included following the text (after Section 8).

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2 SITE BACKGROUND

2.1 SD-08 Site Description

HAFB is located in south central New Mexico, in the northwest central portion of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 2-1). Site SD-08 is located in the northeastern portion of the main base area (Figure 2-2). The original SD-08 Site occupied approximately one-half acre and was surrounded by a chain-link fence. Within the fenced area were Building 131, a steam cleaner washrack with associated drains, and an oil water separator. The area was unpaved with sparse vegetation along the fence. Site topography was, and remains, generally flat. The washrack was installed in 1942 and consisted of a rectangular concrete pad (approximately 1,000 square feet [ft²]). Refuse collection trucks (trash trucks) were routinely washed with soap and water at the washrack. Base records indicate that pesticides were routinely sprayed inside the trucks during the 1970s for fly control; however, this practice ceased in 1982. Drains located at the north end of the washrack connected to a sewer line which carried wastewater to an oil/water separator (OWS) near the northwest corner of the washrack. According to site personnel, it was common for the sewer line to clog, causing the sump and OWS to overflow onto surrounding soil. The washrack pad contained cracks in the concrete and was replaced in 1992 with a new washrack in the same location (Foster Wheeler/Radian, 1995). In 1995 the entire yard area was covered with an asphalt cap as part of the remedial measures performed onsite.

Since 1991 Site SD-08 has been the subject of a series of environmental investigations and one remedial action related to pesticide contamination detected in soil and groundwater. The end result of the remedial action was installation of an asphalt cap that covers approximately 41,000 ft², and a chain link fence surrounding the site to restrict access.

As shown on Figure 2-3, Site SD-08 consists of an asphalt cap, chain link fence, concrete washrack, oil water separator and eight groundwater monitoring wells (MW-08-01 through MW-08-08). Site SD-08 is listed as the Building 131 Washrack (SMWU 82) in Appendix 4-A (Table A) of the HAFB Hazardous Waste Facility Permit No. NM6572124422 (NMED, 2005).

2.2 Previous Investigations

Site SD-08 was identified as a potential contaminant source during the Installation Restoration Program (IRP) Phase I Records Search (CH2M Hill, 1983). As a result, the site was investigated under Phase I of the IRP as Site SD-08 in 1991. The ensuing *Remedial Investigation Report, Investigation, Study and Recommendation for 29 Waste Sites* (Radian, 1992) indicated that pesticide contamination was present in both shallow soil and groundwater onsite. The associated risk evaluation concluded that pesticide concentrations in soil posed an occupational health risk. To mitigate this risk, the site entered into the Feasibility Study/Corrective Measures Study (FS/CMS) process, which established health based cleanup criteria, identified the area exceeding these cleanup

criteria, and recommended the installation of an impermeable cap. The Phase II RFI (Foster Wheeler/Radian, 1995) delineated the extent of organochlorine pesticide contamination in groundwater. During the 29 Waste Sites Remedial Investigation (RI) and Phase II RFI, metals and pesticides were identified in soil samples; further, metals, volatile organic compounds (VOCs) and pesticides were detected in groundwater samples. The primary contaminants attributed to site activities at SD-08 were pesticides. Subsequently, the source of detected VOCs was identified as the former tank area at Area of Concern (AOC)-RR (Radian, 1993). In 1996, Site SD-08 was recommended for long-term groundwater monitoring to ensure that the remedial action was preventing further degradation of groundwater. In 2006, an RFI was conducted to review available information and to collect soil and groundwater data in order to fulfill data gap requirements identified by the NMED (Bhate, 2007). The RFI included a risk based evaluation that was established by using identified target levels and site specific representative COC concentrations. The RFI concluded that residual soil and groundwater concentrations were protective of future onsite receptors and recommend a no further action status for the SD-08 Site (Bhate, 2007).

A complete summary of historical site specific investigations is provided within Section 2.3 of the *Final RCRA Facility Investigation Report, Building 131 Washrack, Site SD-08, Holloman Air Force Base, New Mexico* (Bhate, 2007). Additionally, source characterization and LTM results for Site SD-08 are described in the following documents:

- *Remedial Investigation (RI) Report, Investigation, Study and Recommendation for 29 Waste Sites, Holloman Air Force Base, New Mexico, Volume I*, Radian, June 1992.
- *Draft Final Feasibility Study, Investigation, Study and Recommendation for 29 Waste Sites, Holloman Air Force Base, New Mexico*, Radian, December 1993.
- *Draft Final Phase II RCRA Facility Investigation Report, Table 1 Solid Waste Management Units, Holloman Air Force Base, New Mexico*, Foster Wheeler/Radian, June 1995.
- *Final Long-Term Groundwater Monitoring Report, Holloman Air Force Base, New Mexico*, Bhate, May 2006.
- *Final SD-08 Long Term Groundwater Monitoring Report Quarter 1, Winter 2012, Holloman AFB, New Mexico*, NationView, March 2012.
- *Final SD-08 Long Term Groundwater Monitoring Report Quarter 2, Spring 2012, Holloman AFB, New Mexico*, NationView, June 2012.
- *Final SD-08 Long Term Groundwater Monitoring Report Quarter 3, Summer 2012, Holloman AFB, New Mexico*, NationView, September 2012.
- *Final SD-08 Long Term Groundwater Monitoring Report Quarter 4, Fall 2012, Holloman AFB, New Mexico*, NationView, December 2012.

2.3 Upgradient Site AOC-RR Groundwater Impacts at Site SD-08

As a result of the findings presented in the SD-08 Remedial Investigation Report (Radian, 1992), a Site Investigation was conducted at AOC-RR by Electric Bond and Share Company (EBASCO) Services, Inc. in 1995 (EBASCO/GTI, 1995). AOC-RR (Building 80) was historically used to repair railroad locomotives and included a former underground storage area (three tanks, unknown volumes). The last known product the tanks contained was a petroleum based dust suppressant used for roads. As shown on Figure 2-3 the two areas which comprise AOC-RR (Building 80 and the underground storage tank area) are located approximately 120 feet west and upgradient of SD-08. The AOC-RR Site Investigation included groundwater and soil sampling at SD-08. VOCs or total petroleum hydrocarbons (TPH) were not detected in any of the 13 soil samples collected at AOC-RR during the 1995 Site Investigation (Table 3-3, Appendix A). However, the groundwater data indicated that both sites (SD-08 and AOC-RR) had been impacted by VOCs (petroleum constituents). Specifically, elevated concentrations of ethylbenzene (1,000 micrograms per liter [µg/L]), benzene (870 µg/L), 1,2 DCA (440 µg/L), toluene (90 µg/L), and xylenes (560 µg/L) were detected in the groundwater sample collected from GP-06 (Table 3-4, and Figure 3-4 Appendix A) which is located approximately 120-ft hydraulically up gradient from the SD-08 Site. Additionally, as shown on Figure 3-4 (Appendix A) several other groundwater samples (GP-01, GP-04, GP-05, GP-07, GP-09, GP-11 and GP-13) collected in the vicinity of AOC-RR contained elevated concentrations of VOCs (1,2-DCA, 1,2-DCP, benzene, toluene and ethylbenzene) above current action levels. Historically, 1,2-DCA and 1,2-DCP were commonly used as lead scavengers in antiknock gasoline.

Because VOCs have not been detected in the soil samples collected at either site during previous investigations, the source of VOCs (1,2-DCA and 1,2-DCP) identified in groundwater at SD-08 is still unknown; however, based on the elevated concentrations of VOCs detected in eight of the AOC-RR groundwater samples collected in 1995, AOC-RR is the probable source of elevated VOC contamination (1,2-DCA and 1,2-DCP) identified in several SD-08 monitoring wells (EBASCO/GTI, 1995).

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3 APPLICABLE SCREENING CRITERIA

The analytical data collected during the fifth quarterly (Winter 2013) sampling event has been evaluated against all of the applicable regulatory screening criteria that are specified in Appendix 4-F *Action Levels and Cleanup Levels* of the HAFB Hazardous Waste Permit No: NM6572124422 (NMED, 2004). Groundwater data evaluation will consist of a direct comparison to the applicable action level screening criteria.

The maximum detected concentration of each contaminant which is detected above the method detection limit (MDL) will be used for comparison. The following sections present regulatory screening criteria which will be used to evaluate the groundwater analytical data for the SD-08 fifth quarter sampling event conducted in January 2013.

3.1 VOCs, TAL Metals and General Chemistry

As per Appendix 4-F (NMED, 2004), there are two applicable standards for groundwater, the New Mexico Water Quality Control Commission (NMWQCC) groundwater cleanup levels for contaminants (New Mexico Administrative Code [NMAC] 20.6.2.3103) and the United States Environmental Protection Agency's (USEPA) National Primary Drinking Water Regulations MCLs (USEPA, 2009). The lower of the two standards will be used as action levels for VOCs, and general chemistry parameters (chloride, fluoride, nitrate, nitrite and sulfate). Filtered (dissolved) total analyte (TAL) metals and unfiltered (total) mercury will be compared to the USEPA maximum contaminant levels (MCLs) (USEPA, 2009) and the NMWQCC groundwater standards (NMAC 20.6.2.3103). TAL metals will also be compared to the NMED Approved Background Levels for filtered (dissolved) Constituents in Groundwater (Table 3, NMED 2011b) and unfiltered (total) mercury will also be compared to the NMED Approved Background Levels for Filtered (Dissolved) Constituents in Groundwater (Table 2, NMED 2011b).

3.2 Total Dissolved Solids

There are two applicable standards for total dissolved solids (TDS); the NMWQCC groundwater standards (NMAC 20.6.2.3103) and the USEPA's *National Primary Drinking Water Regulations Secondary MCLs* (USEPA, 2009). The lower of the two standards will be used as the action levels for TDS.

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4 GROUNDWATER SAMPLING FIELD ACTIVITIES

The primary objective of the SD-08 LTM program is to collect additional groundwater data to determine if natural attenuation of previously identified COCs (i.e., 1,2-DCA and 1,2-DCP) identified during the RFI (Bhate, 2007) is occurring. This objective is being accomplished by sampling monitoring wells; MW-08-01, MW-08-02, MW-08-03, MW-08-04, MW-08-05, MW-08-06, MW-08-07, MW-08-08 on a quarterly basis for two years (January 2012 through October 2014). Based on the results of first quarter (Winter 2012) groundwater sampling event, monitoring wells SWMU183-MW03 and S10-MW01 were added to SD-08 monitoring well network for the second quarterly sampling event to assist with delineating the extent of the 1,2-DCA plume. The two additional monitoring wells were sampled for the same parameters as the January 2012 sampling event (VOCs, TAL metals [dissolved and total], general chemistry parameters [chloride, fluoride, nitrate-nitrite and sulfate], and TDS). However, the downgradient extent was not fully delineated, therefore, monitoring well S10-MW06 was added to the monitoring well network during the third quarter to assist in delineating the downgradient extent of the 1,2-DCA plume. Only VOCs were sampled from monitoring well S10-MW06, during the third quarter sampling event at Site SD-08. During this fifth quarter LTM sampling event (Winter 2013) each well, including S10-MW06, was sampled for (VOCs, TAL dissolved metals, mercury [total], general chemistry parameters [chloride, fluoride, nitrate-nitrite and sulfate], and TDS). With the exception of mercury, total TAL metals were not analyzed for during Quarter 5 in accordance with NMED correspondence dated September 20, 2012 (NMED, 2012).

4.1 Groundwater Sampling

Groundwater samples were collected January 21 - 22, 2013 from eleven monitoring wells (MW-08-01 through MW-08-08, SWMU183-MW03, S10-MW01, and S10-MW06) illustrated in Figure 2-3. Prior to sampling, groundwater levels were collected for each monitoring well; Appendix B provides a complete field log of depth to water measurements. Monitoring well purging and sampling was completed with low flow techniques utilizing a peristaltic pump, disposable polyethylene tubing placed at mid-screen, and a groundwater multi-parameter meter equipped with a flow-thru cell. Field parameters were recorded for every well volume of groundwater removed. Field parameters were considered stable when the pH measurements remained constant within 0.1 units; specific conductivity, dissolved oxygen and temperature varied by no more than 10 percent, and turbidity by no more than 5 nephelometric units. Upon reaching stable purging parameters, VOC samples were collected using disposable Teflon bailers followed by collecting the remaining samples using a peristaltic pump at low flow rates. Samples collected for dissolved TAL metals were also field filtered with a 0.45 micron filter. Each of the wells was pumped at an average rate of less than 1 liter per minute. Monitoring Well Sample Collection Forms are included as Appendix C.

4.2 Laboratory Analysis and Data Validation

The analysis of groundwater samples collected during the fifth quarterly sampling event (January 2013) followed the methodologies presented in the NMED approved *Additional Investigation Requirements Work Plan ERP Site SD-08 (SWMU 82 – Building 131 Washrack), Holloman Air Force Base, New Mexico* (Bhate, 2005). All analytical procedures followed the USEPA SW-846 protocol with the groundwater samples from each well being analyzed for the following:

- Volatile Organic Compounds (VOCs) by USEPA Method 8260B
- Target Analyte List (TAL) Metals by USEPA 6010B (dissolved)
- Total Mercury by USEPA 7470A
- Anions: Nitrate, Nitrite, Sulfate, Chloride and Fluoride by USEPA Method 300
- Total Dissolved Solids (TDS) by Method 2540C

All of the laboratory data generated during this quarterly event was validated by the project chemist. Field Quality Assurance (QA)/Quality Control (QC) samples, including trip blanks, matrix spikes, and matrix spike duplicates were collected to document field and laboratory QA/QC. Analytical data packages are provided in Appendix D and the Data Validation Report is included as Appendix E. Gulf Coast Analytical Laboratories (GCAL) in Baton Rouge, Louisiana performed the analysis of all samples collected.

Overall, only minor QC issues were identified during the data validation of the laboratory results and the laboratory took all necessary corrective actions. All of the data were determined to be usable with only minor qualifications. Information regarding the precision, accuracy, representativeness, and completeness is provided in the Data Validation Report (Appendix E) with the following paragraphs providing a synopsis of each analyte group.

VOCs:

A low level detection of acetone was detected in the trip blank associated with samples S10-MW01, S10-MW01-A, MW-08-02 and MW-08-01. The positive results were reported at concentrations less than 10x the blank concentration. This indicated the samples were affected by blank contamination and qualified as non detected (U) and raised to the reporting limit.

The relative percent difference (RPD) between sample MW-08-07 and its field duplicate was outside control limits for acetone and qualified estimated in both samples.

TAL metals:

The metals method blank, associated with all samples, yielded low level detections of total mercury and dissolved cadmium. Those sample concentrations that were less than 5x the blank concentration were considered laboratory artifacts and qualified as not detected, "U", and raised to the sample quantitation limit.

The RPD between sample MW-08-07 and its field duplicate was outside control limits for antimony, cobalt and vanadium. The RPD for vanadium was also outside project defined control limits in sample S10-MW01 and its field duplicate. These compounds were qualified as estimated, "J".

Anions:

No qualification was required of the anion data.

TDS:

No QC deficiencies warranted qualification of the TDS data.

4.3 Surveying and Groundwater Elevations

Monitoring wells used for the potentiometric surface map were surveyed by a qualified surveyor using a survey grade Trimble® Geometrics Pro XR global positioning system (GPS) in accordance with methods described in the *Basewide Quality Assurance Project Plan (QAPP)* (Bhate, 2003). The horizontal locations (northing and easting coordinates) are relative to the World Geodetic System (WGS) 1984 Universal Transverse Mercator (UTM) Coordinate System, Zone 13 North (meters) and surveyed to an accuracy of +/- 0.33 meters. Vertical elevations were referenced to the North American Vertical Datum (NAVD) 1988 and surveyed to an accuracy of +/-0.001 ft. The top of casing for the monitoring wells (vertical control) was used to determine the depth and elevation of the groundwater. The northing and easting and top of casing survey data for the SD-08 Quarter 5 sampling event are included in Table 4-1.

To determine the groundwater flow direction at Site SD-08, groundwater elevations were measured at 13 monitoring wells (MW-08-01 through MW-08-08, S10-MW01, S10-MW02, S10-MW06 and SWMU183-MW03) on January 21, 2013. Static water elevations measured from the top of casing ranged from 4075.04 ft above mean sea level (amsl) at monitoring well MW-09-01 to 4072.39 ft amsl at S10-MW06. Table 4-1 presents the groundwater elevation data collected during this sampling event. A potentiometric surface map of SD-08 was developed using the data collected on January 21, 2013 (Figure 4-1). The groundwater flow direction at SD-08 is primarily to the east-southeast towards Dillard's Draw.

4.4 Equipment Decontamination

All reusable groundwater sampling equipment (water level meter and water quality meter) were decontaminated in accordance with HAFB Standard Operating Procedure (SOP)-2 provided in the *Basewide QAPP* (Bhate, 2003).

4.5 Investigative Derived Waste Handling

Investigative derived waste (IDW) consisting of disposable items such as nitrile gloves and polyethylene tubing, were disposed of in Holloman Air Force Base waste bins, in accordance with HAFB SOP-9 of the *Basewide QAPP* (Bhate, 2003).

Decontamination and purge waters from groundwater sampling were locally contained in 55 gallon steel drums and conveyed to an 18,000 gallon storage (weir) tank located at Site SS-61. The 18,000 gallon storage tank is maintained by NationView, pending laboratory analysis, until disposal through the HAFB Wastewater Treatment Plant (WWTP) is permitted.

4.6 Documentation

All field documentation, sample designation and labeling, and chain of custody procedures were conducted in accordance with the procedures specified in the NMED approved *Additional Investigation Requirements Work Plan ERP Site SD-08 (SWMU 82 – Building 131 Washrack), Holloman Air Force Base, New Mexico* (Bhate, 2005). Copies of the Daily Quality Control Reports (DQCRs) are included in Appendix F.

5 GROUNDWATER ANALYTICAL RESULTS

Monitoring wells MW-08-01 through MW-08-08, SWMU183-MW03, S10-MW01, and S10-MW06 were sampled on January 21st and 22nd, 2013. Groundwater samples were submitted to GCAL for VOC, TAL metals (dissolved), mercury (total), General Chemistry (nitrate-nitrite, chloride, sulfate, fluoride), and total dissolved solids analysis. A summary of the analytical results displaying detections only is provided as Table 5-1. Complete laboratory analytical packages (including chain of custody) and data validation report, are provided in Appendix D and Appendix E, respectively. Figure 5-1 presents NMWQCC and USEPA MCL groundwater exceedences from this sampling event.

5.1 Volatile Organic Compounds

This section summarizes VOC analytical results for the 13 groundwater samples (including two duplicates) collected during the Quarter 5 (January 2013) LTM groundwater sampling event. VOCs were analyzed by USEPA method 8260B.

Eight VOCs (1,2-DCA, 1,2- DCP, 2-butanone, acetone, benzene, bromoform, dibromochloromethane, and tert-butylbenzene) were detected above the MDL in groundwater samples collected during this sampling event. 1,2-DCA was the only VOC detected above the USEPA MCLs and NMWQCC standards. 1,2-DCA was detected with concentrations that exceed the USEPA MCL (5 µg/L) in monitoring wells MW-08-01 (23.8 µg/L), MW-08-02 (63.9 µg/L), MW-08-07 (49.2 µg/L), and S10-MW01 (13.5 µg/L). 1,2-DCA was not detected in any of the remaining wells sampled during this event. Figure 5-2 illustrates the isocontours of 1,2-DCA concentrations detected above the MCL which is currently present in groundwater across Site SD-08. 1,2-DCP was detected in three wells (MW-08-01, MW-08-02, and MW-08-07) with a maximum concentration observed at MW-08-01 (4.97 J µg/L). This detection of 1,2-DCP is just below the USEPA MCL (5 µg/L).

Six additional VOCs were detected at concentrations below applicable groundwater action levels. A low estimated concentration of benzene was detected in monitoring well MW-08-01 (0.584 J µg/L), below the USEPA MCL (5 µg/L). Maximum concentrations of 2-butanone (39.2 µg/L), acetone (6.98 µg/L), and tert-butylbenzene (0.784 J µg/L) were also detected in MW-08-01 during Quarter 5. While, maximum concentrations of bromoform (2.32 J µg/L) and dibromochloromethane (1.24 J µg/L) were detected in MW-08-03. It should be noted that the NMWQCC and USEPA have not established standards for 2-butanone, acetone, bromoform, dibromochloromethane, and tert-butylbenzene.

5.2 Target Analyte List Metals

Target analyte list metals were analyzed via method 6010B/7470A for dissolved and total (mercury only) matrices. The following subsections summarize the dissolved and total TAL metals analysis findings respectively.

5.2.1 Dissolved TAL Metals

Fourteen dissolved (filtered) TAL metals were detected above the MDL in the 13 samples collected (including two duplicates) from monitoring wells MW-08-01 through MW-08-08, S10-MW01, S10-MW06, and SWMU183-MW03. Four of the TAL metals (antimony, iron, manganese, and thallium) were detected above their respective USEPA MCLs, Secondary MCLs, NMWQCC groundwater standards and/or NMED approved background levels (Table 5-1). In addition three dissolved metals (cobalt, silver, and vanadium) were detected above their respective NMED approved background levels (Table 3, NMED 2011b) but at concentrations that do not exceed established action levels.

The following subsections provide a summary of results for the four dissolved TAL metals which were detected above their applicable actions levels and NMED approved background levels. Figure 5-1 presents the distribution of dissolved TAL metals detected in groundwater which exceeded applicable USEPA MCLs, USEPA Secondary MCLs, and/or NMWQCC groundwater standards at SD-08.

Antimony

Antimony was detected in the groundwater samples collected from nine of the eleven monitoring wells above the USEPA MCL (6 µg/L) and the NMED approved background level (6 µg/L) at concentrations ranging from 19 J µg/L (SWMU183-MW03) to 39 J µg/L (S10-MW01 and S10-MW06). The exceedences of antimony most likely represent the natural variability of groundwater geochemistry at SD-08 as antimony was detected across the site both within and outside the boundary of 1,2-DCA contaminated groundwater plume. In addition, antimony was detected at 33 J µg/L in the furthest upgradient monitoring well (MW-08-08) and therefore this detection cannot be associated with the 1,2-DCA contamination (Figure 5-2). Furthermore, no VOCs were detected in the groundwater sample collected from MW-08-08.

Iron

Iron was detected in the groundwater samples collected from two monitoring wells above the USEPA Secondary MCL (300 µg/L) at a concentrations of 6,070 µg/L (MW-08-01) and 660 µg/L (MW-08-02). The maximum iron concentration (6,070 µg/L) also exceeds the NMWQCC standard of 1,000 µg/L. In addition, iron was detected above the NMED approved background level (65.6 µg/L) in both wells. Monitoring wells MW-08-01 and MW-08-02 also had VOC detections and are within the area of 1,2-DCA groundwater contamination (Figure 5-2).

Manganese

Manganese was detected in groundwater samples collected from eight monitoring wells above the USEPA Secondary MCL and the NMED approved background level (50 µg/L) with concentrations ranging from 56 J µg/L (MW-08-05) to 1,840 µg/L (MW-08-01). Seven of the manganese detections also exceed the NMWQCC standard of 200 µg/L. Furthermore, the maximum detection of manganese (1,840 µg/L) was detected in monitoring well MW-08-01 which is located within the boundaries of the 1,2-DCA plume

(Figure 5-2). However, the exceedences of manganese most likely represent the natural variability of groundwater geochemistry at SD-08 as manganese was detected above the USEPA Secondary MCL in three monitoring wells (MW-08-08, SWMU183-MW03 and S10-MW06) which are located outside the 1,2 DCA contaminated groundwater plume.

Thallium

Thallium was detected in groundwater samples collected from five monitoring wells above the USEPA MCL and the NMED approved background level (2 µg/L) at concentrations ranging from 21 J µg/L (SWMU183-MW03) µg/L to 35 J µg/L (MW-08-01). However, the exceedences of thallium most likely represent the natural variability of groundwater geochemistry at SD-08 as thallium was detected above the USEPA MCL in three monitoring wells (MW-08-03, MW-08-06 and SWMU183-MW03) which are located outside the 1,2 DCA contaminated groundwater plume (Figure 5-2).

5.2.2 Total TAL Metals

Unfiltered (total) mercury was detected above the MDL in seven monitoring wells (MW-08-02, MW-08-03, MW-08-05, MW-08-07, MW-08-08, S10-MW01 and SWMU183-MW03). However the maximum mercury concentration detected (0.1 J µg/L) during the fourth quarter sampling event in monitoring well MW-08-05 and MW-08-07, was below the NMWQCC standard (2 µg/L), the USEPA MCL (2 µg/L) and the approved NMED background level (0.5 µg/L) (Table 2, NMED 2011b).

5.3 General Chemistry

General chemistry parameters nitrate, nitrite, chloride, fluoride and sulfate were analyzed in groundwater samples collected from all 11 monitoring wells during the January 2013 sampling event. These parameters were analyzed by USEPA method 300/9056. All of the general chemistry parameters analyzed except for nitrite were detected above the MDL during this sampling event.

Chloride was detected in all 11 monitoring wells at concentrations ranging from 59 milligrams per liter (mg/L) (MW-08-05) to 10,300 mg/L (MW-08-08). With the exception of samples from two wells (MW-08-02 and MW-08-05) all chloride concentrations exceeded the USEPA Secondary MCL (250 mg/L), but were well below the NMED approved background level (35,040 mg/L [Table 2, NMED 2011b]).

Fluoride was detected in ten monitoring wells at concentrations ranging from 1.02 mg/L (MW-08-04) to 5.03 mg/L (MW-08-05). Fluoride concentrations exceeded the NMWQCC groundwater standard (1.6 mg/L) in MW-08-01, MW-08-02, MW-08-05, MW-08-07, S10-MW01, and SWMU183-MW03.

Nitrate was detected in nine monitoring wells at concentrations ranging from 0.321J mg/L (MW-08-05) to 47.5 mg/L (S10-MW06). Nitrate concentrations exceeded the USEPA MCL (10 mg/L) in MW-08-03, MW-08-06, MW-08-08, S10-MW06, and SWMU183-MW03.

Nitrite was not detected in any of the 11 monitoring wells sampled during this event.

Sulfate concentrations were detected in every monitoring well sampled ranging from 1,630 mg/L (MW-08-05) to 7,320 mg/L (S10-MW06). Sulfate also exceeded the USEPA MCL (250 mg/L) in every monitoring well sampled, but all concentrations are well below the NMED approved background level (17,419 mg/L [Table 2, NMED 2011b]).

In summary the highest concentrations of chloride (10,300 mg/L), fluoride (5.03 mg/L), nitrate (47.5 mg/L), and sulfate (7,320 mg/L) were each detected in monitoring wells which are outside the boundary of the 1,2-DCA plume (Figure 5-2). Therefore, these exceedences of most likely represent the natural variability of groundwater geochemistry at Site SD-08.

5.4 Total Dissolved Solids

Total dissolved solids concentrations ranged from 2,270 mg/L (MW-08-05) to 31,600 mg/L (MW-08-08) in the groundwater samples collected during the fifth quarterly sampling event. All of these TDS concentrations exceed both the NMWQCC groundwater standard (1,000 mg/L) and USEPA Secondary MCL (500 mg/L). TDS concentrations below 10,000 mg/L at Site SD-08 are most likely due to leaking water lines which traverse the eastern and northern boundaries of the site. TDS concentrations in five wells (MW-08-03, MW-08-06, MW-08-08, S10-MW01, and S10-MW06) are greater than 10,000 mg/L. Groundwater with TDS concentrations greater than 10,000 mg/L is classified by the USEPA as a Class III B aquifer (USEPA, 1986), which is designated as unfit for human consumption. As a result of this classification the human ingestion of groundwater at SD-08 is not a valid exposure pathway.

6 COMPARISON OF JANUARY 2013 GROUNDWATER SAMPLING RESULTS TO PREVIOUS SD-08 LTM RESULTS

This section provides a comparison of the Winter 2013 (January 2013) quarterly groundwater results with the results of previous quarterly sampling events for the most frequently detected contaminants of concern (VOCs and TAL Metals). Monitoring well S10-MW06 was added during the third quarter sampling event to better delineate the 1,2-DCA contamination identified during the first two sampling events (January and April 2012).

6.1 Volatile Organic Compounds

Table 6-1 presents the current and previous LTM results for the VOCs which exceed action levels in the groundwater samples collected from the SD-08 monitoring well network (1,2-DCA and 1,2-DCP). Figure 6-1 presents 1,2-DCA concentration trends for monitoring wells MW-08-01, MW-08-02, MW-08-07, and S10-MW01. On a well by well basis, comparisons of the January 2013 VOC data to the previous LTM results are summarized below:

- **MW-08-01:** Concentrations of 1,2-DCA continue to exceed USEPA MCL and NMWQCC standards. However, the 1,2-DCA concentration decreased slightly from 29.3 µg/L (October 2012) to 23.8 µg/L (January 2013) and continues to trend lower since the first quarterly sampling event (January 2012 [(Figure 6-1)]). The concentration of 1,2-DCP (4.97 µg/L) has decreased since the January 2012 event 6.49 µg/L and is now less than the USEPA MCL (5 µg/L).
- **MW-08-02:** The concentration of 1,2-DCA increased to 63.9 µg/L and is the highest detection at MW-08-02 in five quarterly sampling events. 1,2-DCA has exceeded the USEPA MCL (5 µg/L) in four of the five quarterly sampling events (Figure 6-1). 1,2-DCP detected at 1.38 µg/L is the highest recorded concentration observed at MW-08-02 since January 2012, however this detection is below the USEPA MCL (5 µg/L).
- **MW-08-03:** As of January 2013, all VOC detections have not exceeded applicable action levels.
- **MW-08-04:** With the exception of low estimated concentrations of acetone and bromoform detected during the second quarter and fifth quarter sampling events, VOCs have not been historically detected.
- **MW-08-05:** Low estimated concentrations of 1,2-DCA and acetone were detected during second quarterly sampling event which were not detected during

the first quarter, however no VOCs were detected during the fifth quarter sampling event (January 2013).

- **MW-08-06:** VOCs have generally not been detected in this well with the exception of low estimated levels of acetone, chloroform and chloromethane observed during the second, fourth, and fifth sampling events.
- **MW-08-07:** Concentrations of 1,2-DCA continue to exceed USEPA MCL and NMWQCC standard. However, the January 2013 concentration of 1,2-DCA decreased from 69.6 µg/L (October 2012) to 49.2 µg/L (January 2013 [Figure 6-1]). 1,2-DCP was also detected slightly lower than the previous sampling event, at a concentration of 1.19 µg/L. Furthermore, this detection of 1,2-DCP continues to be below the USEPA MCL (5 µg/L) .
- **MW-08-08:** No VOCs were detected in this monitoring well in January 2013 or during previous LTM sampling events (Table 6-1).
- **S10-MW01:** Concentrations of 1,2-DCA have slightly decreased from 15.6 µg/L to 13.5 µg/L between the fourth and fifth (October 2012 and January 2013) quarterly sampling events (Figure 6-1). However, detections of 1,2-DCA have remained relatively consistent over the five quarters and continues to exceed the USEPA MCL (5 µg/L) and NMWQCC standard (10 µg/L). Trichloroethene which was initially detected in April 2012, was undetected during the fifth quarter (January 2013).
- **S10-MW06:** No VOCs have been detected above applicable groundwater standards since sampling began for VOCs in July 2012 (Quarter 3).
- **SWMU183-MW03:** During the second, third, fourth, and fifth sampling events no VOCs have been detected above applicable groundwater standards.

6.2 Metals

Table 6-1 shows current and previous LTM results for the most frequently detected dissolved (filtered) TAL metals (arsenic, iron and manganese) in groundwater at Site SD-08. On a well by well basis, comparisons of the January 2013 dissolved TAL metals data to the previous LTM results are summarized below:

- **MW-08-01:** Concentrations of dissolved iron and manganese remained relatively the same from October 2012 to January 2013 and continue to exceed NMWQCC standards. Antimony was detected for the first time during the fourth quarter and continues to exceed the USEPA MCL (6 µg/L) in the fifth quarter. However, these detections of antimony most likely represent the natural variability of groundwater geochemistry across the site. Dissolved iron was detected at MW-08-01 for the first time in January 2013 above the USEPA

secondary MCL (300 µg/L). Furthermore, dissolved thallium was detected above the USEPA (2 µg/L) for the first time in January 2013. All other dissolved TAL metal concentrations have remained relatively constant and were detected below NMWQCC standards and USEPA MCLs.

- **MW-08-02:** Concentrations of dissolved iron and manganese continue to exceed applicable USEPA Primary and Secondary MCLs and remain relatively unchanged. Dissolved arsenic previously detected above the USEPA MCL (10 µg/L) during the first four quarterly sampling events was not detected during the fifth quarter. Dissolved thallium detected above the USEPA MCL (2 µg/L) for the first time during the October 2012 sampling event was not detected in January 2013. Dissolved iron was detected at MW-08-02 for the first time in January 2013 above the USEPA secondary MCL (300 µg/L). All other dissolved metals remained below their applicable NMWQCC and USEPA action levels.
- **MW-08-03:** Dissolved arsenic went undetected for the first time since the second quarter in April 2012. Dissolved iron and manganese were also undetected in January 2013. Dissolved antimony and thallium exceeded their respective USEPA MCLs for the first time in the fifth quarterly sampling event. All other total TAL metals remained below applicable NMWQCC and USEPA action levels.
- **MW-08-04:** Arsenic which was detected for the first time in the third quarter (July 2012) decreased slightly in the fourth quarter (October 2012) and was not detected during the fifth quarter (January 2013). Manganese and iron remain undetected at MW-08-04. Thallium and aluminum which had previously exceeded applicable action levels were not detected during the fifth quarter. All other total TAL metals remained below applicable NMWQCC and USEPA action levels.
- **MW-08-05:** Dissolved arsenic, which had previously increased from non-detect in July 2012 to 15 µg/L in October 2012, was not detected during this sampling event (January 2013). Dissolved iron continues to be undetected at MW-08-05. However, dissolved manganese increased to the highest recorded concentration and exceeded the USEPA secondary MCL (50 µg/L) for the first time in January 2013. Dissolved antimony is the only other TAL metal detected above the USEPA MCL (6 µg/L) during the fifth quarter. Antimony was detected for the first time in October 2012.
- **MW-08-06:** Concentrations of dissolved arsenic which had previously decreased from July to October 2012, was not detected during the fifth quarter (January 2013). Dissolved iron and manganese continue to be undetected at MW-08-06. Dissolved thallium detected for the first time during the fourth quarter continued to exceed the USEPA MCL (2 µg/L) during the fifth quarter. As

discussed in Section 5, this detection of thallium most likely represents the natural variability of groundwater geochemistry across the site.

- **MW-08-07:** Concentrations of dissolved arsenic which had been trending higher for the previous three quarters went undetected during the fifth quarter (January 2013). Dissolved iron continues to be undetected, while, the dissolved manganese concentration (1,390 µg/L) remains relatively consistent with previous quarters and exceeds the USEPA secondary MCL (50 µg/L) and NMWQCC standard (1,000 µg/L). Antimony is the only other TAL metal detected above the USEPA MCL (6 µg/L) during the fifth quarter, and was detected for the first time in the fourth quarter (October 2012).
- **MW-08-08:** Dissolved arsenic which had increased to the highest recorded concentration during the fourth quarter (October 2012), was not detected in January 2013 (Quarter 5). Dissolved iron also continues to be undetected. Dissolved manganese (90 J µg/L) increased from the previous quarter and exceeds the USEPA secondary MCL (50 µg/L). However, this manganese detection is below its historical high observed in January 2012 during the first quarterly sampling event. Antimony is the only other TAL metal previously detected above a USEPA MCL was not detected during the fifth quarter (January 2013).
- **S10-MW01:** Dissolved arsenic which had increased to 22 µg/L in the previous quarter (a historical high concentration) was undetected in the fifth quarter (January 2013). Concentrations of dissolved manganese remains constant above the NMWQCC standard and dissolved iron remains not detected, during the fifth quarterly event. Antimony and thallium are the only other TAL metals detected above the USEPA MCLs. Antimony was detected for the first time during the fourth quarterly sampling event(October 2012).
- **S10-MW06:** Dissolved arsenic which was detected above the USEPA MCL in October 2012 was not detected during the fifth quarter (January 2013). Dissolved iron continues to be undetected, and dissolved manganese remains relatively consistent with the previous quarter (October 2012). Antimony is the only other metal detected above the USEPA MCL. Antimony was not detected in the fourth quarter.
- **SWMU183-MW03:** Dissolved arsenic detected for the first time in October 2013 was not detected in the fifth quarter (January 2013). Concentrations of dissolved manganese remain constant above the NMWQCC standard and dissolved iron remains not detected, during the fifth quarterly sampling event. Antimony and thallium are the only other TAL metals detected above the USEPA MCLs in fifth quarter. Antimony was detected for the first time in October 2012.

7 CONCLUSIONS AND RECOMMENDATIONS

The SD-08 LTM quarterly groundwater sampling program was developed to address COCs (VOCs [1,2-DCA and 1,2-DCP] and TAL Metals [arsenic, iron and manganese]) identified during the 2006 RFI. The primary purpose of the SD-08 LTM sampling groundwater program is to determine if natural attenuation is degrading the previously identified COCs. Analytical results obtained during the fifth quarterly sampling event (January 2013) were evaluated and compared with the results of the previous quarterly sampling events (January, April, July, and October 2012). Based on the results of the first four quarterly sampling events the following actions were implemented during the fifth quarterly sampling event (January 2013):

- In order to further define the extent of the 1,2-DCA plume it was recommended to sample previously installed monitoring well S10-MW06 (as a site SD-08 downgradient monitoring well) during the third quarter (April 2012) and future quarterly sampling events (NationView, June 2012b). The location of this well is shown on Figure 4-1. The additional monitoring well was sampled for VOCs only during Quarter 3 (July 2012). However, during Quarter 4 (October 2012) and Quarter 5 (January 2013) the well was sampled for the entire analytical suite including VOCs, dissolved TAL metals, total mercury, general chemistry parameters [chloride, fluoride, nitrate-nitrite and sulfate], and TDS.
- Based on the Conditional Approval letter, SD-08 LTM Report, Quarter 1, Winter 2012 from NMED dated September 20, 2012 (NMED, 2012a) total TAL metals (unfiltered) analysis was dropped from the LTM program. As required by the NMED mercury is now the only metal collected for total metals (unfiltered) analysis. All other TAL metals were sampled for dissolved (filtered) TAL metals analysis.

Overall, there appears to be a slight decrease in 1,2-DCA and 1,2-DCP concentrations during in the fifth quarterly SD-08 groundwater sampling event compared with the fourth quarterly event (Table 6-1). With one notable exception being an increase in 1,2-DCA concentrations observed in MW-08-02 (Figure 6-1). The following paragraphs summarize the detection and distribution of pertinent COCs and discuss subsequent recommendations.

Since January 2012, 1,2-DCA has exceeded the USEPA MCL (5 µg/L) in four of the Site SD-08 monitoring wells (MW-08-01, MW-08-02, MW-08-07 and S10-MW01). As shown in Figure 6-1, 1,2-DCA concentrations have generally decreased in monitoring well MW-08-01, remained constant in wells S10-MW01 and MW-08-07 and have increased in monitoring well MW-08-02. The decreasing 1,2-DCA concentration trend in MW-08-01 (upgradient well) and increasing 1,2-DCA trend in MW-08-02 suggest that the 1,2-DCA groundwater plume is attenuating and migrating downgradient from AOC-RR (Figure 5-2). All other detected VOCs are below their applicable NMWQCC standards and USEPA MCLs. As shown on Figure 5-2, the concentrations of 1,2-DCA identified in these four monitoring wells exhibit an easterly migration of 1,2-DCA across the SD-08 site. The four monitoring wells with 1,2-DCA exceedences are bound to the

north and south by five monitoring wells (MW-08-03, MW-08-04, MW-08-06, MW-08-08 and SWMU183-MW03) which have not historically detected 1,2-DCA during the LTM program (Table 6-1 and Figure 5-2). As previously discussed in Section 2.3, and shown on Figure 3-4 of Appendix A, historical AOC-RR groundwater samples had elevated 1,2-DCA results that ranged from 9 µg/L to 440 µg/L in six of the AOC-RR groundwater samples (GP-01, GP-04, GP-05, GP-06, GP-09 and GP-11). These groundwater samples were collected immediately downgradient of Building 80 and the suspected underground storage tanks in April 1995 (EBASCO/GTI, 1995). As groundwater flows from the west to east at SD-08 (Figure 4-1), it can be derived that the source of 1,2-DCA groundwater contamination is from the AOC-RR site located due west of Site SD-08 (Figure 5-2). Therefore, NMED has requested that additional monitoring wells be installed upgradient of site SD-08 near this suspected contaminant source (NMED, 2012b).

Although the northern and southern boundaries of the 1,2-DCA plume have been delineated (Figure 5-2) the downgradient (eastern) boundary is still largely undefined due to the exceedences of 1,2-DCA detected above the USEPA MCLs in monitoring well S10-MW01 during the second, third, fourth, and fifth quarterly sampling events.

Presented below are the recommendations to further delineate the nature and extent of 1,2-DCA groundwater contamination currently present at SD-08:

- Install and sample four new monitoring wells for VOCs, TAL metals (dissolved), mercury (total), nitrate, and TDS. The proposed locations of the new monitoring wells are shown on Figure 7-1. The following narrative describes the new monitoring well locations and provides the rationale for installing these wells:
 1. Install one monitoring well located approximately 325 feet east of S10-MW01. The purpose of this well is to delineate the downgradient extent of the 1,2-DCA groundwater plume.
 2. Install one monitoring well located approximately 390 feet southeast (downgradient) of S10-MW01. The purpose of this well is to delineate the downgradient extent of 1,2-DCA groundwater plume.
 3. Install one monitoring well located approximately 120 feet west (upgradient) of MW-08-01 (adjacent to AOC-RR Building 80). The purpose of this well is confirm that AOC-RR is the source of the 1,2-DCA and 1,2-DCP groundwater contamination which has impacted SD-08.
 4. Install one monitoring well located west (upgradient) of MW-08-02 at the location of the suspected AOC-RR underground storage tank area as requested by NMED in the Conditional Approval Letter dated October 5, 2012 (NMED, 2012b).
- Add existing monitoring well S10-MW02 to the LTM program at SD-08.
- Based on the NMED Conditional Approval letter, SD-08 LTM Report, Quarter 2, Spring 2012 dated October 5, 2012 (NMED, 2012b) the general chemistry

parameters fluoride, chloride, nitrite and sulfate analysis will be dropped from the LTM program. Therefore, sampling will continue at existing monitoring wells including offsite monitoring wells SWMU183-MW03, S10-MW01, and S10-MW06 for VOCs, TAL metals (dissolved), mercury (total), nitrate, and TDS.

Dissolved TAL Metals detected at concentrations above the applicable action levels (antimony, iron, manganese, and thallium) are observed in monitoring wells located throughout Site SD-08. The distribution of four of these TAL metals (antimony, iron, manganese, and thallium) at Site SD-08 is ubiquitous, including upgradient and cross gradient monitoring wells SWMU183-MW03, MW-08-04, MW-08-06, and MW-08-08 which have not been impacted by VOC groundwater contamination. Therefore, antimony, iron, manganese, and thallium detected at Site SD-08 are most likely the result of the natural geochemistry of the local groundwater.

Total dissolved solids exceed NMWQCC and USEPA MCL action levels throughout the SD-08 monitoring well network. TDS concentrations in five wells (MW-08-03, MW-08-06, MW-08-08, S10-MW01, and S10-MW06) are greater than 10,000 mg/L. Groundwater with TDS concentrations greater than 10,000 mg/L is classified by the USEPA as a Class III B aquifer (USEPA, 1986), which is designated as unfit for human consumption. As a result of this classification the human ingestion of groundwater at Site SD-08 is not a valid exposure pathway.

General chemistry analytes (chloride, fluoride, nitrate and sulfate and TDS) detected in all SD-08 monitoring wells sampled during the LTM program are common anions found in groundwater throughout HAFB (NationView|Bhate JV II, 2011). The ubiquitous presence of evaporate minerals such as gypsum (calcium sulfate di-hydrate [$\text{Ca}_2\text{SO}_4 \cdot 2\text{H}_2\text{O}$]) at HAFB, is further evidence of the naturally occurring minerals in the area. Additionally, the consistency and frequency of the general chemistry parameters in all SD-08 monitoring wells, including upgradient wells, is further evidence of the likelihood that these analytes are naturally occurring. Consequently in a letter dated October 12, 2012 the NMED has agreed to discontinue the general chemistry analysis with the exception of nitrate and TDS (NMED, 2012b).

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FIGURES