Matrix Environmental Services, LLC.
283 Rucker St.
Anniston, AL 36205
O 256.847.0780
F 256.847.0905
matrixdesigngroup.com

August 3, 2020

Mr. Jason Wilson, Chief
c/o Mrs. Brandi Little
Governmental Hazardous Waste Branch Land Division
Alabama Department of Environmental Management
P.O. Box 301463
Montgomery, Alabama 36130-1463

SUBJECT: Amended Well Abandonment Report for Iron Mountain Road Ranges, Former Fort McClellan, Anniston, Alabama

Dear Mr. Wilson:

Matrix Environmental Services, LLC (MES) on behalf of the McClellan Development Authority (MDA) is submitting the amended report on the completed well abandonment activities at the Iron Mountain Road Ranges as described in the Final Site-Specific Addendum Corrective Measures Implementation Plan (CMIP) – Iron Mountain Road Ranges. This report replaces the previous well abandonment report dated November 11, 2019 and is amended with the report of the abandonment of bedrock well HR-69Q-MW02.

Two hard copies have been provided to Mrs. Brandi Little. Please contact me at (256) 847-0780 should you have any questions or comments.

Sincerely,
Matrix Environmental Services, LLC

Richard Satkin, P.G
McClellan Program Manager

Enclosure

CC: Mrs. Brandi Little, ADEM (two paper copies)
Mr. Jason Odom, MDA (transmittal letter only)
Ms. Lisa Holstein, U.S. Army (one paper copy)
MES Files (one paper copy)

DELMONICO
RESTORATION & DEVELOPMENT

1670 Oakbrook Drive Suite 365
Norcross, GA 30093
Tel/Fax 678.275.4075
www.delmonico-rd.com

July 31, 2020

Mr. Kent Boler, PG
Matrix Environmental Services, LLC
283 Rucker Street
Anniston, AL 36205

Subject: Abandonment of monitoring wells for the Iron Mountain Road Ranges (IMRRs), Parcels 69Q, 71Q, and 75Q, soil remediation site - <u>Amended</u>

Dear Mr. Boler:

Delmonico Restoration & Development, LLC (Delmonico) is pleased to provide this amended report of the abandonment of the remaining groundwater monitoring wells at the subject project site. This report replaces the previous well abandonment report dated November 11, 2019 and is amended with the report of the abandonment of bedrock well HR-69Q-MW02. The report of the well abandonment details is provided below. A photograph log of abandonment activities and conditions are attached as Attachment B to this report.

The five (5) existing overburden groundwater monitoring wells at the site were abandoned from October 28 through October 31, 2019.

- HR-69Q-MW01
- HR-71Q-MW01
- HR-75Q-MW01
- HR-75Q-MW03
- HR-75Q-MW04

These monitoring wells were abandoned in accordance with Section B.5.2(c) of Appendix B of the Alabama Environmental Investigation & Remediation Guidance (AEIRG) for Hazardous Waste Management Sites per the well abandonment plan (Matrix, 2015).

Delmonico performed oversight of these initial well abandonment activities conducted by an Alabama licensed well driller (License #719 - Franklin J. Grantham, dba GeoLab Drilling).

We note that monitoring wells associated with parcel 70Q were previously abandoned by the Army as they were located on ALDOT eastern bypass property.

To prevent intermixing of desirable and undesirable waters and most effectively eliminate migration of contaminants from near the ground surface down-hole to a water-bearing zone, the monitoring wells were first grouted in-place from the bottom to top via the

positive displacement method (tremie grouting) while the well was free of obstructions and debris.

Using a truck mounted CME-55 drill rig, the five overburden wells were then over-drilled using hollow stem augers to the full depth of the well to remove well screen and casing. Following over-drilling the wells were pressure grouted to the surface. The concrete well pads and stick-up casings were also removed. After inspections for grout settlement, the wells were finished by grouting flush to the ground surface with cement/bentonite.

The sixth well, bedrock well HR-69Q-MW02, was destroyed by others prior to abandonment. The stick-up casing and bollards were missing. The well pad was broken and buried. In October 2019, the buried concrete pad and steel casing was excavated to expose the well remnants. During this initial attempt at abandonment, it was observed that the steel casing was damaged and the well was blocked so that the hollow stem auger could not be advanced within the steel casing more than a few feet, so the steel well casing was cut off and removed to approximately four feet below ground surface and the top foot of the well was sealed with cement/bentonite.

During a teleconference call with ADEM on January 22, 2020 to discuss the well abandonments, ADEM expressed concerns about potential open casing and it was determined that an additional effort to unblock and grout deep well HR-69Q-MW02 would be performed and a revised abandonment report would be submitted.

Unexpectedly large precipitation accumulations throughout the spring of 2020 kept soil conditions saturated and we deferred the re-excavation of bedrock well HR-69Q-MW02 until July 15, 2020, when it was uncovered and abandoned as described below.

The area around the bedrock well HR-69Q-MW02 was excavated to a depth approximately eight feet below ground surface (bgs) to expose the top four feet of the remnants of the steel casing and previously placed cement/bentonite plug. The excavation was benched and sloped to allow workers to safely enter the excavation to perform abandonment activities. The cement/bentonite plug previously placed on the well in October 2019 was removed and the steel casing was cut off with a torch and removed. The well was then unplugged of mud and debris manually and confirmed to be clear to depth. Bentonite chips were then gravity fed into the well followed by fresh clean water. After a period of time to allow the bentonite chips to absorb the water, a 20% solids pumpable bentonite grout (Quik-Grout®) was mixed and slowly gravity fed into the well, until the well was completely filled to the top. Additional Quik-Grout® was added as the level dropped until there was no more grout settlement. The top two feet of the well was sealed with cement/bentonite and the well area was backfilled and graded.

The well abandonment details are summarized on Table 1 which has been amended to include details of the abandonment of bedrock well HR-69Q-MW02. A summary of

variances is provided in Table 2. Both tables are provided as Attachment A to this letter. Debris from the well abandonment was drummed and was transported with waste soils and other Site debris to an offsite Subtitle D landfill. Attachment B is a photograph log of abandonment activities.

If you have any questions or need additional information, please feel free to contact me at (678) 772-7809.

Sincerely,
DELMONICO

Jeffery P. Bauman
Vice President

Attachments

Table 1 - McClellan IMRR - Well Abandonment Details

	Well Location								Material Used to Seal Well					
Well Designation	Northing	Easting	Well Material	Well Depth ft bgs	Screen Length ft	Screen Interval ft bgs	Well Pad Removed (Y/N)	Well Casing Removed (Y/N)	Quick-Grout	Portland/ Bentonite	Pressure (P) or Gravity Fed (GF)	Grouted in Place (GIP) or Over-Drilled (OD)	Grout Volume, gallons	Over-Drill Depth Achieved, ft bgs
HR-71Q-MW01	1162474.07	664840.16	2" ID Sch. 40 PVC	36	15	21 - 36	Y	Y	✓	Top 2 ft.	P	OD	56	38.5
HR-75Q-MW04	1163966.00	665038.58	2" ID Sch. 40 PVC	38	15	23 - 38	Y	Y	✓	Top 2 ft.	P	OD	58	40.0
HR-75Q-MW01	1164257.50	665144.23	2" ID Sch. 40 PVC	36	15	21 - 36	Y	Y	✓	Top 2 ft.	P	OD	57	39.0
HR-75Q-MW03	1164540.48	665233.36	2" ID Sch. 40 PVC	83	20	63 - 83	Y	Y	✓	Top 2 ft.	P	OD	125	86.0
HR-69Q-MW01	1165779.18	665455.28	2" ID Sch. 40 PVC	47	20	27 - 47	Y	Y	✓	Top 2 ft.	P	OD	72	49.0
HR-69Q-MW02 (previously destroyed)	1165769.61	665468.55	2" ID Sch. 80 PVC	102	10	92 - 102	Y	Y to 4 ft bgs	✓	Top 2 ft.	GF	GIP	140	See Table 2

Table 1 Notes:

Overburden well abandonment occurred from October 28 through October 31, 2019. Re-excavation of bedrock well HR-69Q-MW02 was deferred until July 15, 2020, when it was uncovered and abandoned.

Well Information Source: IMRR RI Table 2-3.

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

HR-69Q-MW02: 8" ID steel casing to 57 ft bgs and 6" ID steel casing to 85.5 ft bgs casing off 2" ID schedule 80 PVC well casing and screein in bedrock.

Abbreviations:

2": 2-inch

ID: inside diameter

Sch. 40 PVC: Schedule 40, polyvinyl chloride.

Sch. 80 PVC: Schedule 80, polyvinyl chloride.

bgs: Below ground surface.

ft: Feet.

Table 2 - McClellan IMRR - Summary of Variances

Variances	Justifiication	Impact to Well Abandonment
Bedrock monitoring well HR-69Q-MW02 was destroyed prior to well abandonment activities so well casings could not be removed and the well could not be overdrilled. The well was uncovered, steel casings cut off approx. 8 feet below grade, unplugged, gravity fed with bentonite and bentonite grout, and then sealed.	Well was destroyed prior to well abandonment activitities by timbering actvities (likely 2017-2018) which prevented over-drilling.	No impact to well abandonment as IMRRs were NFA for ground water, the well location is not within the planned remediation area, and the bedrock well was filled and sealed with quick grout and portland/bentonite.

Photograph 1 - Monitoring well HR-69Q-MW01 being grouted in-place from the bottom to top via the positive displacement method (tremie grouting).

Photograph 2 - Monitoring well HR-69Q-MW01 being over-drilled using hollow stem augers to the full depth of the well to remove well screen and casing

Photograph 3 - View of well being grouted to surface after overdrilling.

Photograph 4 - Condition of deep bedrock well HR-69Q-MW02 prior to abandonment activity (destroyed by others prior to abandonment).

Photograph 5 - First attempt to abandon HR-69Q-MW02. Inner casing plugged to greater than 4.5 feet below ground surface.

Photograph 6 - Second attempt to abandon HR-69Q-MW02. Outer casing cut off and inner casing cleared at about 9 feet below ground surface.

Photograph 7 - Bedrock well HR-69Q-MW02 after excavating, cutting casing, removal of mud and debris manually.

Photograph 8 - Preparing to Abandon bedrock well HR-69Q-MW02 with bentonite Quik Grout.

Photograph 9 - Gravity feeding well sealing materials into bedrock well HR-69Q-MW02.

Photograph 10 - Bedrock well HR-69Q-MW02 after sealing with cement/bentonite.

Photograph 11 - Bedrock well HR-69Q-MW02 finished by grouting flush to the ground surface with cement/ bentonite.