

Voluntary Remediation Program

No Further Action Report / Conditional No Further Action Report

Upon achieving the remediation levels and controls determined pursuant to Arizona Revised Statutes (A.R.S.) § 49-175(B), a Volunteer may request ADEQ provide a determination that no further action is needed for a site or portion of a site by submitting this Report.

Site Name:	
Site Code:	
Volunteer:	
Report completed by:	
Date:	
<input type="checkbox"/>	No Further Action
<input type="checkbox"/>	Conditional No Further Action (a Declaration of Environmental Use Restriction is being placed on the Site)

When completing this form, if additional space is needed, use extra box on Page 3.

1. A description of the specific contaminants for which a no further action determination is being sought. (List for each media.)

2. A description of the actions taken to achieve remediation levels or controls.

3. A description of any soil, water, or soil and water treatment systems used as part of the remediation.

4. Whenever institutional or engineering controls are placed at the site:

a. A demonstration that any engineering control or combination of engineering controls has been constructed, is functioning, and will be maintained.

b. A description of the proposed land use for the site and a demonstration that the use will not compromise the integrity of the engineering controls and will be in accordance with any institutional controls.

5. If post remediation monitoring is proposed, a description of the type of monitoring, monitoring locations, contaminants to be monitored, monitoring frequency and sampling procedures.

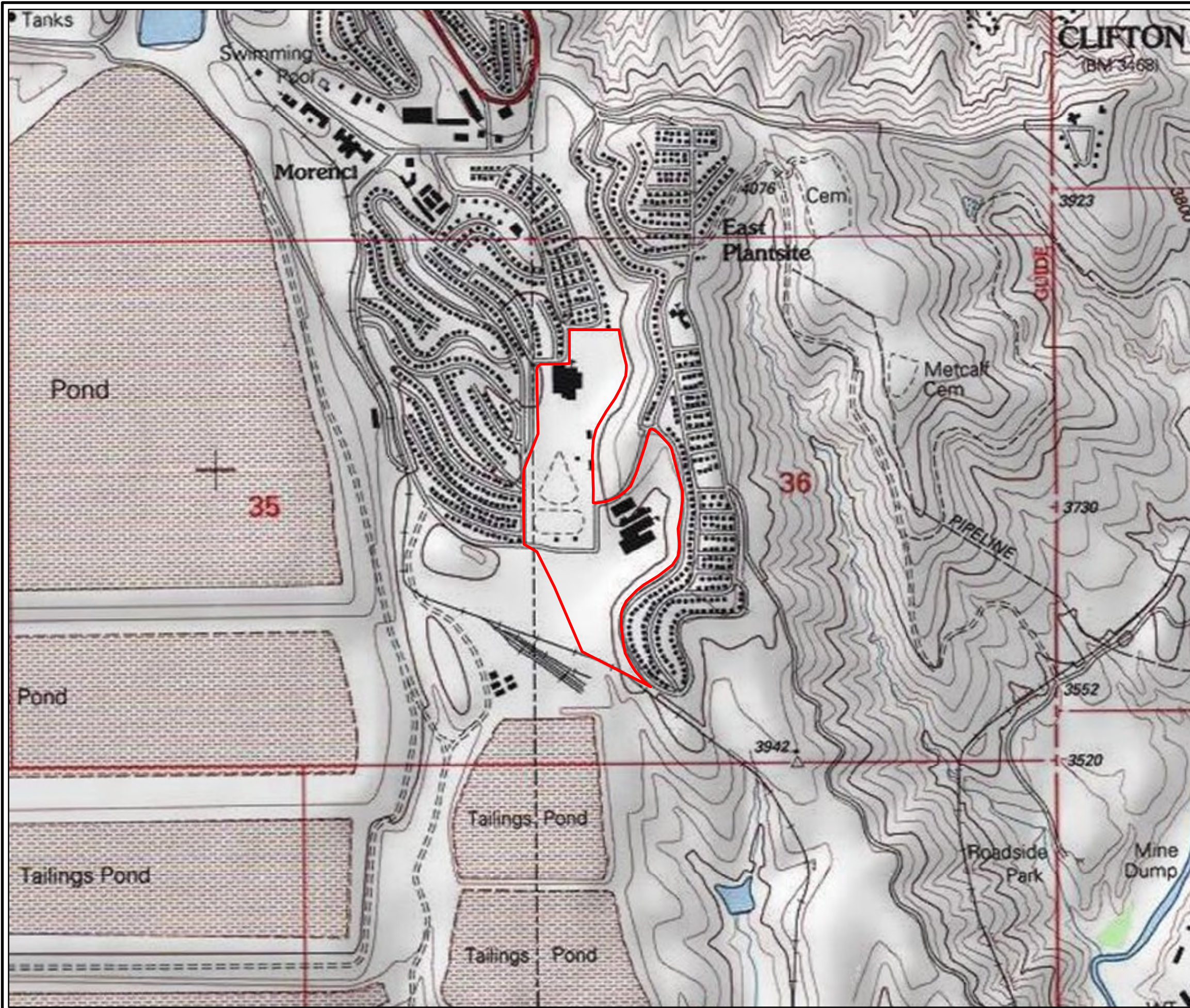
6. A description of community involvement activities undertaken to meet the requirements of A.R.S. § 49-176.

7. A list of permits under this title obtained for the remedial action or held by the Volunteer pertaining to the Site.

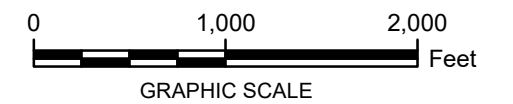
Please attach the following to this report:

- A map of scaled, clearly defined, and labeled NFA/CNFA boundary/ies.
- A draft NFA/CNFA public notice.
- A list of stakeholders who have been identified to receive direct notice of the NFA/CNFA public comment period, if necessary.

Use the following space to provide additional information:



LEGEND:
 NFA BOUNDARY AREA



FREEPORT MINERALS CORPORATION
 MORENCI, ARIZONA

MORENCI SCHOOLS SITE (VRP 513333-00)
NFA BOUNDARY AREA

ARCADIS Design & Consultancy
 for natural and built assets

FIGURE
1

Morenci Schools Soil Characterization and Summary

A Site Characterization Report completed in 2020 identified arsenic as the only chemical of potential concern at the Site. As shown in Table 1 attached (excerpted from Table 8 of the Site Characterization Report, June 2020), the other target constituents that were detected in soil and tailings samples collected from locations across the school complex where students, faculty, and staff may be present were below the Arizona Department of Environmental Quality (ADEQ) state-wide residential soil remediation levels (SRLs). Additional samples for arsenic analysis were collected in 2021 from the athletic fields (the North Baseball field and the Football/track complex). The objective of the additional Athletic Fields soil sampling was to collect representative samples and analytical testing results that can be used, in conjunction with the data collected during soil sampling in 2020, to support further development of a risk evaluation for students and staff using these Athletic Fields.

Tailings do not appear to be a source of elevated metals at the Site. The naturally occurring topsoil and fill material imported to the Site during the construction of the school complex have higher arsenic concentrations compared to the tailings. The source of the arsenic in topsoil and fill material is not known and could be representative of background levels in the naturally occurring materials or anthropogenic. The background levels of the topsoil and fill material cannot be established because the source location of the imported materials is unknown and occurred over many years of time as the school complex was constructed and expanded.

Results of the 2020 Site-Wide Soil Sampling Program

The range of target analyte concentrations observed in the soil samples is presented below (excerpted from Table 8 of the Site Characterization Report, June 2020):

Table 1 - Range of Concentrations Detected in Soil Samples

Target Constituent	Soil Remediation Levels (mg/kg) ⁽¹⁾	Minimum (mg/kg)	Maximum (mg/kg)
Aluminum	76,000	409	15,300
Antimony	31	3.16	7.11
Arsenic ⁽²⁾	10	0.556	37.1
Barium	15,000	18.3	295
Beryllium	150	0.0393	5.33
Cadmium	39	0.093	8.35
Calcium	---	1,060	83,600
Chromium	120,000 ⁽³⁾	1.02	103
Cobalt	900	0.166	14.8

Morenci School Site
Morenci, Arizona

Target Constituent	Soil Remediation Levels (mg/kg) ⁽¹⁾	Minimum (mg/kg)	Maximum (mg/kg)
Copper	3,100	5.69	2,580
Iron	---	5.890	31,000
Lead	400	1.66	145
Magnesium	---	75	5,470
Manganese	3,300	4.04	2,040
Mercury	23	0.011	0.206
Molybdenum	390	1.06	135
Nickel	1,600	0.889	56.2
Potassium	---	443	2,450
Selenium	390	1.86	1.86
Silver	390	0.182	2.04
Sodium	---	31.7	1,200
Thallium	5.2	Not detected	Not detected
Vanadium	78	0.838	63.4
Zinc	23,000	2.82	436

Notes:

- (1) mg/kg – milligrams per kilogram
- (2) The arsenic SRL is not a risk-based standard but is based on an average state-wide background
- (3) Chromium III

The HHRA¹ was completed in 2021 included a screening level assessment that concluded that SRLs and other screening levels based on a residential scenario are protective of a school scenario. Of the potential receptors that may be present in a school scenario, children are the most sensitive.

The National Oil and Hazardous Substances Pollution Contingency Plan² established that acceptable exposure levels are generally concentration levels that represent an incremental upper-bound lifetime cancer risk in the

⁴ Ramboll. 2021. Human Health Risk Assessment for the Morenci School Complex. Morenci, Arizona. Ramboll US Consulting, Inc. Seattle, Washington. September 30.

² USEPA. 1991. Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions. OSWER Directive 9355.0-30. Office of Solid Waste and Emergency Response, U.S. Environmental

Morenci School Site
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range from 10⁻⁴ to 10⁻⁶ or less. The state of Arizona has adopted this lifetime cancer risk range in its VRP Statute, Arizona Revised Statute (A.R.S.) 49-175.B.2 & 49-152.B.2.

The HHRA included an assessment of risks to a child attending the schools and to an adult school staff member. The results of the risk assessment are summarized in the attached Table 8 from the Ramboll HHRA, and show that the combination of exposure parameter distributions, point estimates, and school-specific arsenic data used to develop the PRA model for the Site resulted in a cumulative 95th percentile Lifetime Excess Cancer Risk (LECR) estimate of 5x10⁻⁷ for the student, well below the acceptable range described above.

Using probabilistic methods, exposure data compiled by the USEPA, ODEQ, and others were combined with school-specific data to estimate exposures over the time spent in preschool/elementary school, middle school and high school. Exposure estimates were then combined with toxicity values to provide a distribution of risk estimates that takes into account both variability and uncertainty. For the student athlete, the probabilistic analysis yielded a refined, lower 95th percentile risk estimate of 2 x 10⁻⁶ and HQ estimate 0.02. For the coach, the refined 95th percentile risk estimate was 6 x 10⁻⁷ and HQ estimate was 0.008. The combined reasonable maximum 95th percentile risk and HQ estimates for the student athlete and coach were 3 x 10⁻⁶ and 0.03, respectively.

For the refined probabilistic assessment, general students who do not use the athletic fields as regularly as student athletes and groundskeepers who work throughout the school complex were also assessed. The 95th percentile cancer risk estimate was 6 x 10⁻⁷ and noncancer HQ was 0.008 for both the student and the groundskeeper. The combined reasonable maximum 95th percentile risk and HQ estimates for the student and groundskeeper were 1 x 10⁻⁶ and 0.02, respectively. These estimates are at the lower end of USEPA's and ADEQ's acceptable risk range and are well below the hazard protection goal.

Table 8: Risk Assessment Results

Exposure Scenario	Method	Receptor	LECR Estimate				HQ Estimate			
			Ingestion	Dermal	Inhalation	Cumulative	Ingestion	Dermal	Inhalation	Cumulative
Athletic Fields	Deterministic	Student Athlete	6E-06	1E-07	5E-10	6E-06	0.06	0.001	0.00004	0.06
		High School Baseball Coach*	2E-06	1E-07	8E-10	2E-06	0.01	0.0009	0.00004	0.01
		Sum Student Athlete and Coach	8E-06	3E-07	1E-09	8E-06	0.07	0.002	0.00007	0.07
	Probabilistic	Student Athlete	2E-06	4E-07	5E-10	2E-06	0.02	0.004	0.00003	0.02
		High School Baseball Coach	4E-07	2E-07	9E-10	6E-07	0.007	0.002	0.00004	0.008
		Sum Student Athlete and Coach	3E-06	6E-07	1E-09	3E-06	0.03	0.006	0.00007	0.03
General School	Probabilistic	Student	5E-07	1E-07	2E-10	6E-07	0.007	0.002	0.00002	0.008
		Adult Groundskeeper	4E-07	2E-07	2E-09	6E-07	0.007	0.002	0.0001	0.008
		Sum Student and Groundskeeper	9E-07	3E-07	2E-09	1E-06	0.01	0.004	0.0002	0.02

Notes:

HQ - Hazard Quotient, LECR - Lifetime Excess Cancer Risk

*Preliminary deterministic methods indicated the high school baseball coach intake was highest among the assessed staff (middle school and high school baseball coaches, football coaches and PE teachers). Only risks for this receptor are presented and further assessed using probabilistic methods.

For the probabilistic analysis, the reported risks are the 95th percentile value of the risk distribution.

Protection Agency, Washington, D.C. Also 29 CFR 1910.120, 40 CFR 300.430.

2021 Athletic Fields Sampling

In 2021, FMC collected additional soil samples at the north baseball field and football/track complex at the Morenci schools property. The objective of the additional soil sampling was to collect representative samples and analytical testing results that can be used, in conjunction with the data collected during soil sampling in 2020, to support further development of a risk evaluation for students and staff using these Athletic Fields.

Seventy-one (71) soil samples were collected at the North Baseball Field and Football Complex during the 2021 Athletic Fields soil sampling program. The range of arsenic concentrations observed in the Athletic Fields soil samples is presented in Table 2 below (excerpted from Table 1 of the Football and Baseball Fields Restoration Completion Report, August 2024):

Table 2 - Range of Arsenic Concentrations Detected in Soil Samples

Athletic Field Location	Arsenic Minimum (mg/kg)	Arsenic Maximum (mg/kg)
North Baseball Field	11.6	43.3
Football Complex – Track Exterior	7.87	28.8 J
Football Complex – Track Interior	22.0	62.6

Note: field duplicate values excluded. J – estimated value.

Mean concentrations were also computed for the two general areas of sampling as shown below:

- Mean arsenic concentration for the north baseball field – 25.5 mg/kg;
- Mean arsenic concentration for the football field inside the track – 39.6 mg/kg.
- Mean arsenic concentration for the area outside the track within the football complex – 15.9 mg/kg