

RECEIVED

By Division of Waste Management and Radiation Control at 12:16 pm, Jun 22, 2022

DSHW-2022-017482

Site Management Plan for the Former Eastern Alum Ponds Area

Former Engelhard Facility

Salt Lake City, Utah

UTD009073800

November 3, 2004 – UPDATED JUNE 17, 2022

Terracon Project No. 61087229



Prepared for:

Ninigret Technology Park, L.C.
1700 South 4650 West
Salt Lake City, Utah 84101

Prepared by:

Terracon Consultants, Inc.
Midvale, Utah

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

RECEIVED

By Division of Waste Management and Radiation Control at 12:16 pm, Jun 22, 2022

Site Management Plan for the Former Eastern Alum Ponds Area

Former Engelhard Facility

Salt Lake City, Utah

UTD009073800

November 3, 2004 – UPDATED JUNE 17, 2022

Terracon Project No. 61087229



Prepared for:

Ninigret Technology Park, L.C.
1700 South 4650 West
Salt Lake City, Utah 84101

Prepared by:

Terracon Consultants, Inc.
Midvale, Utah

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials



June 17, 2022

The Ninigret Group, L.C.
1700 South 4650 West
Salt Lake City, Utah 84104

Attn: Gary McEntee
T: (801) 973-9090
E: gary@ninigret.com

**Re: Updated Site Management Plan
Former Eastern Alum Ponds Area
Former Engelhard Facility
Salt Lake City, Utah
UTD009073800
Terracon Project No. 61087229**

Dear Mr. McEntee:

As requested, we are providing this updated version of the Site Management Plan (SMP) for the former eastern alum ponds area. The original (2004) SMP for this area included language that referenced requirements for groundwater monitoring. The groundwater monitoring program has been discontinued, pending formal approval by the Utah Department of Environmental Quality (DEQ). This SMP is updated primarily to remove language that had referenced groundwater monitoring obligations in the original SMP. Additionally, all references to the overseeing DEQ agency have been updated to indicate the current name of the agency, the Division of Waste Management and Radiation Control (DWMRC), and the SMP has been updated to reflect the fact that corrective action was completed and the site has since been redeveloped.

We appreciate the opportunity to be of assistance in this matter. If you should have any questions or need additional information, please contact me at (801) 746-5462 or at andy.king@terracon.com.

Sincerely,
Terracon Consultants, Inc.

Andy King, P.G.
Senior Project Manager - Environmental

Benjamin B. Bowers
Authorized Project Reviewer

Terracon Consultants, Inc. 6949 South High Tech Drive Midvale, Utah 84047
P [801] 545 8500 terracon.com

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 Scope	1
1.2 Site Background	2
2.0 REMAINING CONSTITUENTS	3
3.0 SITE RISK	3
3.1 Human Health Risk	3
3.2 Ecological Risk	5
4.0 SITE MANAGEMENT REQUIREMENTS	6
4.1 Land Use Restrictions	6
4.2 Groundwater Use Restrictions	6
4.3 Hazard Notification	7
4.4 Soil Excavation	7
4.5 Enforcement	8
5.0 PROPERTY ACCESS	8
6.0 MONITORING REQUIREMENTS	8
7.0 PROCEDURES IF SMP REQUIREMENTS ARE BREACHED	9
8.0 REFERENCES	9

APPENDICES

APPENDIX A Former Eastern Alum Ponds Area Map and Legal Description

1.0 INTRODUCTION

1.1 Scope

This Site Management Plan (SMP) describes site management actions for the eastern portion of Solid Waste Management Unit (SWMU) #20, known as the Eastern Alum Ponds, at the former Engelhard facility (the Facility).

This SMP is based on the results of a baseline human risk assessment (MSE, 2004a) and an ecological risk assessment (MSE, 2004b) submitted to the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control (DWMRC) in accordance with the requirements at Utah Administrative Code (UAC) R315-101. The requirements at R315-101 establish standards to support risk-based cleanup and closure standards at sites for which remediation or removal of constituents to background levels will not be achieved. Preliminary human health risk estimates had indicated that the level of risk may exceed 1×10^{-6} for carcinogens or a Hazard Index of one for non-carcinogens based on a residential exposure scenario. However, the actual and future land use conditions do not include residential land use and offer a more protective exposure scenario than residential land use. Therefore, the human health risk assessment was conducted in accordance with Utah Administrative Code (UAC) R315-101-5.2 (b)(2) for actual and future land use conditions, based on site-specific physical and chemical information and the assumption that the affected media will not have undergone any remediation or controls to reduce exposure.

The site is in an area zoned for commercial/industrial (light manufacturing) land use, and the actual land use for the now-redeveloped site is commercial/light industrial. The redevelopment provides a more protective exposure scenario than the prior land use, as exposure pathways have been eliminated by placement of buildings, paved parking areas, and landscaped areas that prevent contact with constituents beneath the site. Furthermore, the site is not, and will not be, used in a residential land use scenario.

Because constituents at this site will not be remediated or removed to background levels, R-315-101-6 requires a Site Management Plan and provides three options for the SMP. These SMP options are summarized as follows:

- 1) The SMP may contain a no further action option only if the level of human health risk present at the site is below 1×10^{-6} for carcinogens and a Hazard Index of "less than one" for non-carcinogens based on a residential exposure scenario.
- 2) The SMP must contain appropriate management activities e.g., monitoring, deed notations, site security, or post-closure care, if the level of human health risk present at the site is less than 1×10^{-4} for a risk assessment based on actual land use conditions, but greater than 1×10^{-6} for a

risk assessment based on a residential exposure scenario, and the Hazard Index is "less than one" using both exposure scenarios. The SMP may, but is not required to, include corrective action.

- 3) The SMP must contain procedures for corrective action if the level of human health risk present at the site is greater than 1×10^{-4} for carcinogens, or a Hazard Index of "greater than one" for non-carcinogens, for a risk assessment based on the actual land use.

As discussed in Section 2 of this SMP, for onsite commercial workers and construction workers the level of human health risk is less than 1×10^{-4} for carcinogens and the Hazard Index is not greater than one for non-carcinogens based on actual land use conditions, and assuming that no remediation or controls are implemented to mitigate potential exposure to constituents at the site. Based on the estimated risk levels, a Site Management Plan is required for this site, and the SMP must include appropriate management actions.

1.2 Site Background

The former Engelhard plant site was located at 2550 Andrew Avenue in western Salt Lake City. The alum ponds (SWMU #20) were located approximately one-half mile west of the Facility in the northern half of Sections 17 and 18, Township 1 South, Range 1 West, Salt Lake Base and Meridian. The Eastern Alum Ponds, located in Section 17 immediately east of Bangerter Highway and south of California Avenue, encompassed approximately 170 acres.

Filtrol Corporation purchased land occupied by the Facility and the alum ponds in 1950, and the Facility was developed as an activated clay catalyst production plant. The material in the eastern alum ponds is a by-product of the former activated clay catalyst production process, which was conducted at the Facility by Filtrol Corporation from 1951 to approximately 1981. The primary raw materials included natural aluminosilicate clays and sulfuric acid. The process involved drying and crushing the natural clays before treating them with sulfuric acid, thereby removing undesirable materials that were separated from the stripped clays via a series of thickener vessels. The stripped clays were then filtered, dried, ground, pelletized, and thermally treated to produce activated clay catalysts. The by-products including alum (aluminum sulfate), silicates, and low-pH water were discharged to the alum ponds. The by-products were initially discharged to the NE pond in the northeastern portion of SWMU #20 (east of the present-day Bangerter Highway) and were later discharged also to the L pond and the western ponds as these ponds were subsequently constructed. By 1981, Filtrol Corporation had ceased the activated clay catalyst production process and was converting operations to the production of fresh alumina catalyst and regeneration of spent alumina catalyst. The fresh alumina catalyst production process did not generate wastes that were discharged to the alum ponds. However, scrubber blowdown water and non-contact cooling water from the regeneration process were discharged to the eastern alum ponds between 1981 and 1989. No materials were discharged to the eastern alum ponds after 1989. Engelhard Corporation acquired the Facility in 1988 and ceased

operations at the site in 2000. Ninigret Technology Park acquired the property in portions during 2000 and 2002.

A Corrective Action Plan (CAP) was developed for the eastern alum ponds and approved by the DWMRC in January 2003 (MSE, 2003a). The CAP was based on practical and cost-effective treatment methods developed during similar corrective actions previously conducted within the western alum ponds. The corrective action approach involved application of lime or similar carbonate-based additives to neutralize the acidic alum materials and prevent additional alum liquor from forming. This process resulted in a stabilized end product that exhibits near neutral pH, low metals leachability, and adequate bearing capacities to allow for building and redevelopment for commercial/light industrial land use. The process effectively resulted in containment of metals within the treated soils, which were subsequently covered by clean fill material, buildings, pavement, and minor landscaped areas as the site was redeveloped. The corrective action procedures were implemented in phases beginning in January 2003, with final completion by September 2009.

2.0 REMAINING CONSTITUENTS

Metals concentrations exceeding site-specific background concentrations remain in the near-surface and subsurface soils on the site and in groundwater beneath the site. However, the level of risk to non-residential users of the property is well below the limits established at UAC R315-101 for current and future land use at the property, assuming no controls to minimize exposure. Additionally, the potential for adverse effects to ecological resources from site constituents is minimal, assuming the site were to remain undeveloped. Redevelopment of the site, including the construction of buildings, paved parking areas, and paved roadways, provides controls to eliminate exposure pathways and further reduce the potential for exposure to human and ecological receptors.

3.0 SITE RISK

3.1 Human Health Risk

A baseline human health risk assessment was conducted for the eastern alum ponds of Solid Waste Management Unit # 20 located east of Bangerter Highway (MSE, 2004a). This risk assessment was completed in accordance with Utah Administrative Code (UAC) R315-101 "Cleanup Action and Risk-Based Closure Standards," and is consistent with relevant U.S. Environmental Protection Agency (EPA) guidance. The risk assessment was conducted based on data collected according to a DWMRC-approved Sampling and Analysis Plan and Quality Assurance Plan (SAP/QAP) dated June 21, 2001. Chemicals detected in soil and groundwater were evaluated using the procedures outlined in the State of Utah Cleanup Action and Risk-Based Closure Standard (R315-101-5) and relevant EPA guidance. The soil and groundwater analytical results used in the risk assessment represent baseline conditions independent of corrective action

and future site redevelopment. All chemicals detected in soil and groundwater were evaluated in the risk assessment. If the chemical concentration of a solid sample exceeded its corresponding background concentration, it was retained for evaluation in the risk assessment. All chemicals detected in groundwater were retained for evaluation in the risk assessment.

The risk assessment and its SAP/QAP were designed to evaluate the human health risk due to exposure to volatile organic compounds and metals in soils and groundwater. However, volatile organic compounds were not detected in soil or groundwater and are, therefore, not potential chemicals of concern. Potential chemicals of concern in the eastern alum ponds include: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc.

A Site Conceptual Exposure Model was developed for the site to identify potential receptors and potential exposure pathways. Potential receptors include future construction workers, and future site workers in a commercial/light industrial land use scenario. Commercial land use exposure factors were used in the risk assessment to determine if excess human health risk exists in the absence of corrective action or controls provided by redevelopment. The exposure routes evaluated in the risk assessment are consistent with commercial land use and State of Utah Cleanup Action and Risk-Based Closure Standards. The potential exposure pathways evaluated in the risk assessment for a future construction worker include: incidental ingestion, dermal contact, and inhalation of particulates from alum affected surface and subsurface soils; and incidental ingestion and dermal contact of groundwater. The potential exposure pathways evaluated in the risk assessment for a future commercial site worker include: incidental ingestion, dermal contact, and inhalation of particulates from alum affected surface soils. These potentially complete exposure pathways were conservatively evaluated for the future commercial worker, assuming no controls (e.g., buildings, pavement, landscaping, etc.) are present. However, the redevelopment has rendered these pathways incomplete for the future commercial worker.

The human health risks associated with carcinogenic and non-carcinogenic chemicals of potential concern were estimated in the risk assessment. For carcinogens, risks are estimated as the probability of an individual developing cancer over their lifetime as a result of exposure to a carcinogen. Carcinogenic human health risk is expressed as a probability; for example 1×10^{-6} , means one-in-one million chance that an individual will develop an adverse effect. Non-carcinogenic risk is expressed as a hazard index. The hazard index is a ratio that, if greater than 1, may represent potential for non-carcinogenic health effects. EPA standardized risk assessment reporting tools (Standard Tables) were used to document the risk assessment. The Standard Tables document the majority of the data and assumptions used to evaluate risk, as well as the risks and hazards calculated (MSE, 2004a).

Quantitative results of the baseline risk assessment indicate that for the future commercial worker, the total carcinogenic risk (4×10^{-6}) is well below the action level (1×10^{-4}) that mandates corrective action, as set forth in Utah's Cleanup Action and Risk-Based Closure Standards.

Similarly, the total non-carcinogenic hazard index (0.1) for the future commercial worker is well below the hazard index standard of 1. The risk assessment assumed baseline conditions without any corrective action, engineering controls, or development to reduce or control exposure to site constituents. Therefore, under actual land use conditions that include controls provided by corrective action and site redevelopment, the health risk to future commercial workers is less than the values calculated in the baseline risk assessment.

For the future construction worker, the risk assessment indicates a total carcinogenic risk of 9×10^{-6} , well below the action level of 1×10^{-4} . The highest segregated non-carcinogenic hazard index for the future construction worker (1) does not exceed 1.

3.2 Ecological Risk

In addition to a human health risk assessment, Utah's risk-based closure rules require an ecological risk assessment unless a waiver is granted by DWMRC. Ninigret previously requested a waiver based on the lack of ecological receptors and habitat at the site under current and future land use conditions. DWMRC informed Ninigret that the future land use conditions (development for commercial/light industrial use) are considered similar to administrative controls, and as such an ecological risk assessment would need to be prepared to evaluate potential ecological effects that could occur if the site were to remain undeveloped. Accordingly, Ninigret developed an ecological risk assessment (ERA) that assumes that the site remains undeveloped (MSE, 2004b).

Using site-specific chemical data and an inventory of the biological community at the site and surrounding area, the ecological risk was quantified for a subset of measurement receptors likely to be exposed to the site in the shrub-scrub and aquatic food webs, assuming that the site remains undeveloped. For the purposes of the ecological assessment, in the shrub-scrub food web it is assumed that rodents colonize the site and serve as prey for carnivorous birds and mammals including the red-tailed hawk and the red fox. In the aquatic food web, it is assumed that mallard ducks are exposed to water, sediment, and plants in the nearby Lee Drain and Brighton Canal ditches. In addition, the ecological risk was quantified for the red fox in the aquatic food web by ingestion of water from the Lee Drain Ditch. Using highly conservative default values and assumptions, ecological screening quotients (ESQs) were calculated for each of the selected measurement receptors, and phytotoxicity to plants was evaluated using available soil phytotoxicity benchmarks.

Based on the results of the ERA, if the site remained undeveloped, the potential would exist for adverse effects to ecological resources from site constituents. However, the site has been redeveloped as part of actual land use, which effectively eliminates the establishment of habitat and the potential for exposure of ecological receptors to site constituents.

4.0 SITE MANAGEMENT REQUIREMENTS

The actual and future land use for the site is commercial/light industrial and does not include use for residential purposes. Based on the level of risk at the site with respect to actual and future land use, R-315-101-6 requires that the SMP contain appropriate management actions to minimize the potential for exposure to constituents. The following site management actions are designed to control site risks by minimizing the potential for exposure to site constituents.

4.1 Land Use Restrictions

The site is in an area already zoned for commercial/industrial (light manufacturing) land use. As such, the current zoning precludes development for residential land use. Additional land use restrictions will be imposed to prevent residential development (including childcare facilities and early education schools) and ensure that the property is used solely for commercial and industrial purposes in the future. Similarly, no edible crops will be grown on site without the approval of UDEQ. These restrictions will be imposed and enforced on the current property owner through deed notices and on subsequent property owners through an environmental covenant.

To minimize potential exposures to ecological receptors, the site development including roadways, buildings, and pavements, will be maintained to prevent the development of habitat for ecological receptors.

All portions of any waterway (such as the Brighton Canal or Lee Drain) shall not be in direct contact with treated material. Any waterway that currently exists or is subsequently placed within the footprint of the eastern alum ponds shall be lined or otherwise constructed such that a separation is maintained between the water within the waterway and the treated material thereby preventing direct contact between the water and the treated material. The integrity of this separation shall be maintained at all times.

4.2 Groundwater Use Restrictions

Restrictions will also be imposed to prevent use of groundwater from beneath the site.

This paragraph applies to cases in which groundwater is encountered during a normal work activity such as underground or in ground utility placement, where groundwater needs to be removed to facilitate that work activity. Groundwater management options are intended to comply with the principles of non-degradation in R315-101-3. In the event that temporary excavation dewatering is needed to facilitate a work activity, any groundwater to be extracted will be characterized for metals constituents and managed accordingly, unless it is to be returned directly to the aquifer from which it originated. Groundwater that is extracted may be returned directly to the aquifer from which it originated within the area adjacent to the ongoing work, so long as the return of that groundwater does not meet the criteria of an injection well as defined at Utah Administrative Code R317-7-2.53. Groundwater may be discharged offsite to a sanitary sewer

system with prior approval from the system's Publicly Owned Treatment Works (POTW) and may be discharged offsite to a storm water system, the Lee Drain, or the Brighton Canal with prior approval from the Utah Division of Water Quality. Groundwater that does not exceed background concentrations of constituents does not have a restriction on its disposition by DWMRC.

4.3 Hazard Notification

Controls provided by the site development (buildings, paved areas, landscaping, etc.) will render all potential exposure pathways to future commercial workers incomplete. Therefore, no notification beyond implementation of all other requirements of this SMP is warranted for future commercial workers. If initial commercial workers occupy a portion of the site before the development establishes sitewide exposure controls, potential exposure pathways may temporarily be complete (e.g., for commercial workers outside of buildings). Under these conditions, the risk levels for the commercial worker are significantly below the regulatory standard of 1×10^{-4} (carcinogenic risk) and non-carcinogenic hazard index of 1. However, because the potential for exposure will exist for the initial commercial workers, these workers will be notified of the existing hazard beneath the site and of methods to minimize the risks associated with the hazard.

Future construction workers who excavate into subsurface soils and/or groundwater will be exposed to constituents by the exposure pathways evaluated in the risk assessment. Under these conditions, the risk levels do not exceed the regulatory standard of 1×10^{-4} (carcinogenic risk) and non-carcinogenic hazard index of 1. Because the exposure pathways will be complete, future construction workers involved in excavation within the site shall be notified of the existing hazards and procedures to minimize the potential for exposure to site constituents. This notification may be provided in the form of a fact sheet, developed by the Owner, to be incorporated into the construction worker's health and safety program. A qualified person shall write the notifications.

4.4 Soil Excavation

Based on the risk levels estimated for future construction workers, exposure to constituents in soils through excavation for construction purposes will not result in risk levels exceeding the standards set forth in UAC R315-101-6(d). Therefore, restrictions on excavation are not necessary beyond hazard notification in accordance with Section 4.3 above. However, since the soils contain inorganic constituents at concentrations exceeding natural background levels, soils excavated from the property must be properly managed to ensure that they are not deposited at any offsite location used for residential purposes. Therefore, all excavated material from the property shall either remain on the property or be disposed at an appropriately licensed treatment, storage, and disposal (TSD) facility. Based on the characteristics of the untreated and treated alum materials, any soil resulting from excavation activities would not be classified as a hazardous waste and would likely be accepted for disposal as solid waste at a properly permitted landfill facility. Removal of soils off of the site to any other location or facility, including a soil recycling facility, will require UDEQ approval.

4.5 Enforcement

The above site management actions are intended to follow title to the land in perpetuity through a deed notice and shall apply to and bind all subsequent property owners unless subsequent determinations by the Utah Division of Solid & Hazardous Waste or its successors indicate that the remaining level of risk is sufficiently low that the site management requirements may be reduced or eliminated.

The above site management requirements shall be imposed and enforced on the current owner pursuant to an Environmental Covenant. Following approval of this Site Management Plan, the owner will file and record the Environmental Covenant, providing notice of its obligations concerning access and site management requirements on the property. Additionally, effective the date that this document is recorded in the Salt Lake County Recorder's Office, each deed, title or other instrument of conveyance conveying an interest in the property executed by the owner or its successors in title to the property shall include a notice stating that the property is subject to this Site Management Plan and shall reference the recorded location of the Site Management plan and the restrictions applicable to the property under the Site Management Plan. The above site management requirements are intended to follow title to land in perpetuity unless subsequent determinations by the DWMRC or its successors indicate that the remaining level of risk to human health and the environment on the site is sufficiently low that the site management requirements may either be reduced or eliminated in their entirety.

5.0 PROPERTY ACCESS

Commencing on the date of approval of this Site Management Plan and in accordance with Paragraph 59 of the Stipulation and Consent Agreement No 92060130 ("Consent Agreement") between the Utah Solid and Hazardous Waste Control Board ("Board") and Engelhard Corporation, the predecessor-in-title to the property, all activities conducted by the Property Owner under this Site Management Plan shall be subject to inspection and enforcement by the Board in accordance with procedures in the Utah Solid and Hazardous Waste Act, Section 19-6-101 et seq., Utah Code Annotated (1953 as amended). The Property Owner shall provide the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control and its representatives and its authorized contractors, with access at all reasonable times to the property for the purpose of monitoring, sampling and observing activities carried out under the Site Management Plan. These individuals shall conduct themselves in a safe and prudent manner in accordance with the health and safety standards of the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control.

6.0 MONITORING REQUIREMENTS

Monitoring to ensure compliance with land use restrictions, groundwater use restrictions, limited excavation restrictions, and hazard notifications shall be the responsibility of the Property Owner

and/or its assigns. These site management actions will be implemented concurrently with the construction and development of the site. Documentation of the state of compliance with these site management requirements is to be updated annually and submitted to DWMRC upon request.

7.0 PROCEDURES IF SMP REQUIREMENTS ARE BREACHED

The stated site management requirements provide for continued protectiveness of human health and the environment based on current and future land use. If and when the Property Owner and /or its assigns (Property Owner) becomes aware of a deviation from the site management plan requirements the Property Owner shall notify DWMRC within five (5) calendar days of their becoming aware of the deviation. The Property Owner will submit to DWMRC a written report within twenty-five (25) days, detailing the nature of the deviation and the Owner's evaluation. The Property Owner and DWMRC will collectively re-evaluate whether the existing site management practices compromise the level of protection afforded by the original site management requirements and, if so, the need for alternate site management requirements will be evaluated to provide a comparable level of protection. Any proposed modification to the site management plan requirements will require DWMRC approval.

8.0 REFERENCES

Millennium Science & Engineering, 2004a. *Responses to Division Comments on Western Alum Ponds Corrective Action Report, Former Engelhard Facility, Salt Lake City, Utah* (January 2004)

Millennium Science & Engineering, 2004b. *Alum Sludge Stabilization Corrective Action Report, Eastern Alum Ponds Initial Treatment Area, Former Engelhard Facility, Salt Lake City, Utah* (Interim Draft, May 2004)

Millennium Science & Engineering, 2004c. *Site Management Plan for the Western Alum Ponds (Western Portion of SWMU #20), Engelhard Facility, Salt Lake City, Utah* (Final Version, June 2004)

Millennium Science & Engineering, 2004d. *Human Health Risk Assessment, Eastern Alum Ponds, Former Engelhard Facility, Salt Lake City, Utah* (July 2004)

Millennium Science & Engineering, 2004e. *Ecological Risk Assessment, Eastern Alum Ponds, Former Engelhard Facility, Salt Lake City, Utah* (July 2004)

Millennium Science & Engineering, 2003a. *Eastern Alum Ponds Corrective Action Plan, Former Engelhard Facility, Salt Lake City, Utah* (January 2003)

Site Management Plan, Former Eastern Alum Ponds Area

Former Engelhard Facility ■ Salt Lake City, Utah

June 17, 2022 ■ Terracon Project No. 61087229



Millennium Science & Engineering, 2003b. *Alum Sludge Stabilization Corrective Action Report, Western Alum Ponds, Former Engelhard Facility, Salt Lake City, Utah* (February 2003)

Millennium Science & Engineering, 2003c. *Ecological Risk Assessment, Former Engelhard Facility, Western Alum Ponds, Salt Lake City, Utah* (April 2003, Revised August 2003)

Millennium Science & Engineering, 2002. *Addendum to Corrective Action Plan (including DSHW comments and responses), Engelhard Facility, Salt Lake City, Utah* (September 2002)

Millennium Science & Engineering, 2001a. *Alum Sludge Stabilization Corrective Action Plan, Engelhard Facility, Salt Lake City, Utah* (March 2001)

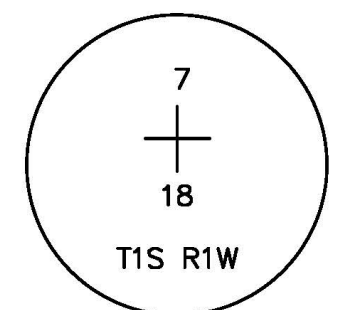
Millennium Science & Engineering, 2001b. *Sampling & Analysis Plan and Quality Assurance Plan for Risk Assessment of the Western Alum Ponds, Engelhard Facility, Salt Lake City, Utah*, (March 9, 2001, Revised June 21, 2001)

Millennium Science & Engineering, 2001c. *Sampling & Analysis Plan/Quality Assurance Plan for Characterization of Solid Waste Management Units #1, #2, and #20, Engelhard Facility, Salt Lake City, Utah*, (May 2001, Revised June 21, 2001)

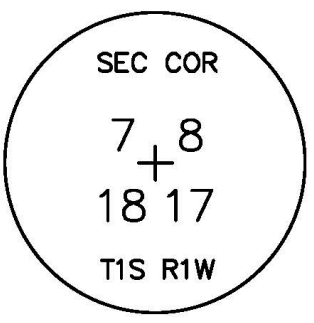
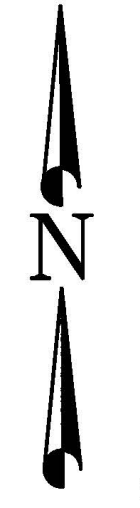
Millennium Science & Engineering, 2001d. *Baseline Human Health Risk Assessment for the Western Alum Ponds, Engelhard Facility, 2550 West Andrew Avenue, Salt Lake City, Utah* (October 10, 2001)

APPENDIX A

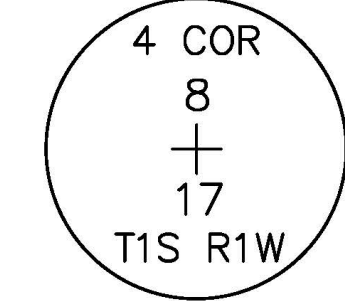
Former Eastern Alum Ponds Area Map and Legal Description



North 1/4 Corner Section 18
T. 1 S., R. 1 W. S.L.B.&M.
Found Salt Lake County Monument



Northwest Corner Section 17
T. 1 S., R. 1 W. S.L.B.&M.
Found Salt Lake County Monument



North 1/4 Corner Section 17
T. 1 S., R. 1 W. S.L.B.&M.
Found Salt Lake County Monument

LINE TABLE		
Line	BEARING	LENGTH
L1	N 42°08'12" W	24.44
L2	N 32°51'07" W	101.85
L3	N 27°01'57" W	101.98
L4	S 89°58'06" W	3.43
L5	N 00°27'29" W	29.51
L6	S 89°32'31" W	0.37

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	BEARING	CHORD	TANGENT
C1	50.00'	78.58'	90°03'03"	S 44°49'41" E	70.74'	50.04'
C2	106.00'	166.96'	90°14'39"	S 44°55'29" E	150.23'	106.45'
C3	3688.96'	996.82'	15°28'56"	N 7°58'54" W	993.79'	501.46'
C4	539.00'	30.97'	3°17'31"	N 1°45'31" E	30.97'	15.49'

**NIN TECH WEST
REMEDIAION AREA DESCRIPTION**

A parcel of land located in the Northwest Quarter of Section 17 and the Northeast Quarter of Section 18, Township 1 South, Range 1 West, Salt Lake Base and Meridian, more particularly described as follows:

BEGINNING at the Northwest corner of said Section 17 (the basis of bearings is North 89°54'49" East 2670.69 feet measured between the Northwest corner and the North Quarter of said Section 17), and running thence North 89°54'49" East 2196.87 feet along the north line of said Section 17; thence South 03°29'33" East 1027.91 feet; thence South 89°51'13" East 268.82 feet to a point of curvature with a 50.00 foot radius to the right; thence southeasterly 78.58 feet along the arc of said curve through a central angle of 90°03'03" (chord bears South 44°49'41" East 70.74 feet); thence South 00°11'50" West 1198.45 feet to a point of curvature with a 106.00 foot radius to the left; thence southeasterly 166.96 feet along the arc of said curve through a central angle of 90°14'39" (chord bears South 44°55'29" East 150.23 feet); thence South 89°57'11" West 2921.41 feet; thence North 42°08'12" West 24.44 feet; thence North 32°51'07" West 101.85 feet; thence North 27°01'57" West 101.98 feet; thence North 15°43'22" West 1170.64 feet to a point of curvature with a 3688.96 foot radius to the right; thence northerly 996.82 feet along the arc of said curve through a central angle of 15°28'56" (chord bears North 07°58'54" West 993.79 feet); thence North 00°14'26" West 15.26 feet; thence South 89°58'06" West 3.43 feet; thence North 00°27'29" West 29.51 feet; thence South 89°32'31" West 0.37 feet to a point on a 539.00 foot radius non-tangent curve to the right; thence northerly 30.97 along the arc of said curve through a central angle of 03°17'31" (chord bears North 01°45'31" East 30.97 feet) to the north line of said Section 18; thence along said line South 89°57'57" East 817.83 feet the POINT OF BEGINNING.

Contains 7240274.23 square feet or 166.214 acres, more or less.



Path: F:\NIN TECH E-W REMEDIATION 3606\SURVEY\Nin Tech East Remediation Exhibit.dwg | plot date: June 16, 2022 | plotted by: bryan

DRAWN	BJE 6/22	CHECKED	JDP 6/22
DESIGNED		PROJECT ENGINEER	
APPROVED	JDP	PROJECT MANAGER	

NINIGRET CONSTRUCTION COMPANY LC
SALT LAKE CITY, SALT LAKE COUNTY, UTAH

Dominion
Engineering Associates, L.C.
5684 South Green Street
Murray, Utah 84123 801-713-3000

**REMEDIAION AREA EXHIBIT
NIN TECH EAST**
**LOCATED IN THE NW1/4 OF SEC. 17 & THE NE1/4 SEC. 18
TOWNSHIP 1 SOUTH, RANGE 1 EAST, SALT LAKE BASE & MERIDIAN**

PROJECT NO.		3606	
SHEET NO.		1 of 1	
NO.	REVISIONS	BY	DATE
0	RELEASED FOR REVIEW	JDP	6.15.22
SCALE:		1"=150'	



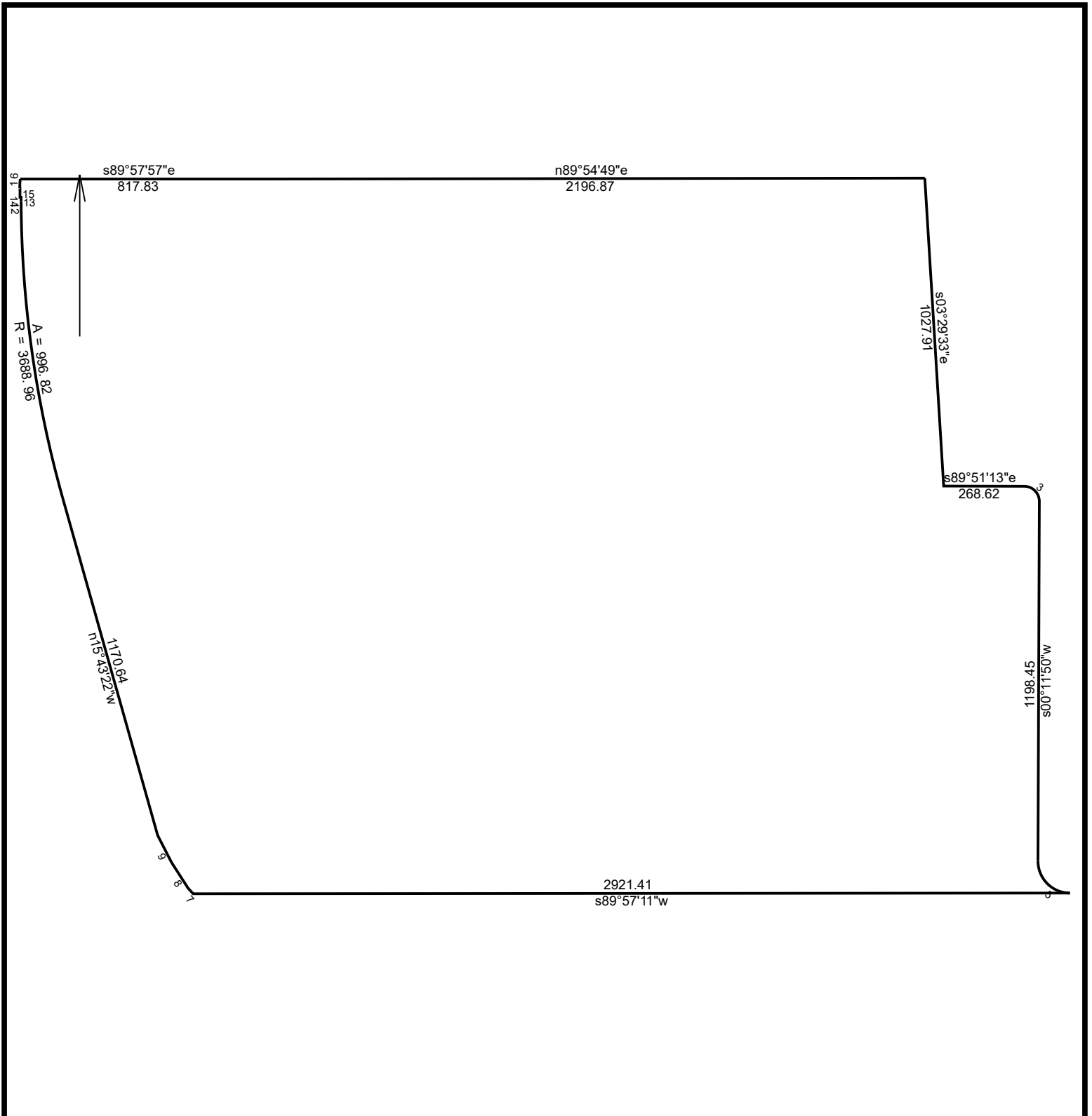
June 15, 2022

**NIN TECH
East Remediation Area Description**

A parcel of land located in the Northwest Quarter of Section 17 and the Northeast Quarter of Section 18, Township 1 South, Range 1 West, Salt Lake Base and Meridian, more particularly described as follows:

BEGINNING at the Northwest corner of said Section 17 (the basis of bearings is North $89^{\circ}54'49''$ East 2670.69 feet measured between the Northwest corner and the North Quarter of said Section 17), and running thence North $89^{\circ}54'49''$ East 2196.87 feet along the north line of said Section 17; thence South $03^{\circ}29'33''$ East 1027.91 feet; thence South $89^{\circ}51'13''$ East 268.62 feet to a point of curvature with a 50.00 foot radius to the right; thence southeasterly 78.58 feet along the arc of said curve through a central angle of $90^{\circ}03'03''$ (chord bears South $44^{\circ}49'41''$ East 70.74 feet); thence South $00^{\circ}11'50''$ West 1198.45 feet to a point of curvature with a 106.00 foot radius to the left; thence southeasterly 166.96 feet along the arc of said curve through a central angle of $90^{\circ}14'39''$ (chord bears South $44^{\circ}55'29''$ East 150.23 feet); thence South $89^{\circ}57'11''$ West 2921.41 feet; thence North $42^{\circ}08'12''$ West 24.44 feet; thence North $32^{\circ}51'07''$ West 101.85 feet; thence North $27^{\circ}01'57''$ West 101.98 feet; thence North $15^{\circ}43'22''$ West 1170.64 feet to a point of curvature with a 3688.96 foot radius to the right; thence northerly 996.82 feet along the arc of said curve through a central angle of $15^{\circ}28'56''$ (chord bears North $07^{\circ}58'54''$ West 993.79 feet); thence North $00^{\circ}14'26''$ West 15.26 feet; thence South $89^{\circ}58'06''$ West 3.43 feet; thence North $00^{\circ}27'29''$ West 29.51 feet; thence South $89^{\circ}32'31''$ West 0.37 feet to a point on a 539.00 foot radius non-tangent curve to the right; thence northerly 30.97 along the arc of said curve through a central angle of $03^{\circ}17'31''$ (chord bears North $01^{\circ}45'31''$ East 30.97 feet) to the north line of said Section 18; thence along said line South $89^{\circ}57'57''$ East 817.83 feet the POINT OF BEGINNING.

Contains 7240274.23 square feet or 166.214 acres, more or less.



NIN TECH East Remediation Area

6/14/2022

Scale: 1 inch = 449 feet

File: nin tech east remediation.ndp

Tract 1: 166.2137 Acres, Closure: n73.4242e 0.01 ft. (1/999999), Perimeter=11152 ft.

- | | |
|--|---|
| 01 s03.2933e 1027.91 | 12 n00.1426w 15.26 |
| 02 s89.5113e 268.62 | 13 s89.5806w 3.43 |
| 03 Rt, r=50.00, delta=090.0303, arc=78.58, chord=s44.4941e 70.74 | 14 n00.2729w 29.51 |
| 04 s00.1150w 1198.45 | 15 s89.3231w 0.37 |
| 05 Lt, r=106.00, delta=090.1439, arc=166.96, chord=s44.5529e 150.23 | 16 Rt, r=539.00, delta=003.1731, arc=30.97, chord=n01.4531e 30.96 |
| 06 s89.5711w 2921.41 | 17 s89.5757e 817.83 |
| 07 n42.0812w 24.44 | 18 n89.5449e 2196.87 |
| 08 n32.5107w 101.85 | |
| 09 n27.0157w 101.98 | |
| 10 n15.4322w 1170.64 | |
| 11 Rt, r=3688.96, delta=015.2856, arc=996.82, chord=n07.5854w 993.79 | |



June 17, 2022

The Ninigret Group, L.C.
1700 South 4650 West
Salt Lake City, Utah 84104

Attn: Gary McEntee
T: (801) 973-9090
E: gary@ninigret.com

**Re: Updated Site Management Plan
Former Eastern Alum Ponds Area
Former Engelhard Facility
Salt Lake City, Utah
UTD009073800
Terracon Project No. 61087229**

Dear Mr. McEntee:

As requested, we are providing this updated version of the Site Management Plan (SMP) for the former eastern alum ponds area. The original (2004) SMP for this area included language that referenced requirements for groundwater monitoring. The groundwater monitoring program has been discontinued, pending formal approval by the Utah Department of Environmental Quality (DEQ). This SMP is updated primarily to remove language that had referenced groundwater monitoring obligations in the original SMP. Additionally, all references to the overseeing DEQ agency have been updated to indicate the current name of the agency, the Division of Waste Management and Radiation Control (DWMRC), and the SMP has been updated to reflect the fact that corrective action was completed and the site has since been redeveloped.

We appreciate the opportunity to be of assistance in this matter. If you should have any questions or need additional information, please contact me at (801) 746-5462 or at andy.king@terracon.com.

Sincerely,
Terracon Consultants, Inc.

Andy King, P.G.
Senior Project Manager - Environmental

Benjamin B. Bowers
Authorized Project Reviewer

Terracon Consultants, Inc. 6949 South High Tech Drive Midvale, Utah 84047
P [801] 545 8500 terracon.com

Environmental ■ Facilities ■ Geotechnical ■ Materials

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 Scope	1
1.2 Site Background	2
2.0 REMAINING CONSTITUENTS	3
3.0 SITE RISK	3
3.1 Human Health Risk	3
3.2 Ecological Risk	5
4.0 SITE MANAGEMENT REQUIREMENTS	6
4.1 Land Use Restrictions	6
4.2 Groundwater Use Restrictions	6
4.3 Hazard Notification	7
4.4 Soil Excavation	7
4.5 Enforcement	8
5.0 PROPERTY ACCESS	8
6.0 MONITORING REQUIREMENTS	8
7.0 PROCEDURES IF SMP REQUIREMENTS ARE BREACHED	9
8.0 REFERENCES	9

APPENDICES

APPENDIX A	Former Eastern Alum Ponds Area Map and Legal Description
-------------------	---

1.0 INTRODUCTION

1.1 Scope

This Site Management Plan (SMP) describes site management actions for the eastern portion of Solid Waste Management Unit (SWMU) #20, known as the Eastern Alum Ponds, at the former Engelhard facility (the Facility).

This SMP is based on the results of a baseline human risk assessment (MSE, 2004a) and an ecological risk assessment (MSE, 2004b) submitted to the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control (DWMRC) in accordance with the requirements at Utah Administrative Code (UAC) R315-101. The requirements at R315-101 establish standards to support risk-based cleanup and closure standards at sites for which remediation or removal of constituents to background levels will not be achieved. Preliminary human health risk estimates had indicated that the level of risk may exceed 1×10^{-6} for carcinogens or a Hazard Index of one for non-carcinogens based on a residential exposure scenario. However, the actual and future land use conditions do not include residential land use and offer a more protective exposure scenario than residential land use. Therefore, the human health risk assessment was conducted in accordance with Utah Administrative Code (UAC) R315-101-5.2 (b)(2) for actual and future land use conditions, based on site-specific physical and chemical information and the assumption that the affected media will not have undergone any remediation or controls to reduce exposure.

The site is in an area zoned for commercial/industrial (light manufacturing) land use, and the actual land use for the now-redeveloped site is commercial/light industrial. The redevelopment provides a more protective exposure scenario than the prior land use, as exposure pathways have been eliminated by placement of buildings, paved parking areas, and landscaped areas that prevent contact with constituents beneath the site. Furthermore, the site is not, and will not be, used in a residential land use scenario.

Because constituents at this site will not be remediated or removed to background levels, R-315-101-6 requires a Site Management Plan and provides three options for the SMP. These SMP options are summarized as follows:

- 1) The SMP may contain a no further action option only if the level of human health risk present at the site is below 1×10^{-6} for carcinogens and a Hazard Index of "less than one" for non-carcinogens based on a residential exposure scenario.
- 2) The SMP must contain appropriate management activities e.g., monitoring, deed notations, site security, or post-closure care, if the level of human health risk present at the site is less than 1×10^{-4} for a risk assessment based on actual land use conditions, but greater than 1×10^{-6} for a

risk assessment based on a residential exposure scenario, and the Hazard Index is "less than one" using both exposure scenarios. The SMP may, but is not required to, include corrective action.

- 3) The SMP must contain procedures for corrective action if the level of human health risk present at the site is greater than 1×10^{-4} for carcinogens, or a Hazard Index of "greater than one" for non-carcinogens, for a risk assessment based on the actual land use.

As discussed in Section 2 of this SMP, for onsite commercial workers and construction workers the level of human health risk is less than 1×10^{-4} for carcinogens and the Hazard Index is not greater than one for non-carcinogens based on actual land use conditions, and assuming that no remediation or controls are implemented to mitigate potential exposure to constituents at the site. Based on the estimated risk levels, a Site Management Plan is required for this site, and the SMP must include appropriate management actions.

1.2 Site Background

The former Engelhard plant site was located at 2550 Andrew Avenue in western Salt Lake City. The alum ponds (SWMU #20) were located approximately one-half mile west of the Facility in the northern half of Sections 17 and 18, Township 1 South, Range 1 West, Salt Lake Base and Meridian. The Eastern Alum Ponds, located in Section 17 immediately east of Bangerter Highway and south of California Avenue, encompassed approximately 170 acres.

Filtrol Corporation purchased land occupied by the Facility and the alum ponds in 1950, and the Facility was developed as an activated clay catalyst production plant. The material in the eastern alum ponds is a by-product of the former activated clay catalyst production process, which was conducted at the Facility by Filtrol Corporation from 1951 to approximately 1981. The primary raw materials included natural alumino-silicate clays and sulfuric acid. The process involved drying and crushing the natural clays before treating them with sulfuric acid, thereby removing undesirable materials that were separated from the stripped clays via a series of thickener vessels. The stripped clays were then filtered, dried, ground, pelletized, and thermally treated to produce activated clay catalysts. The by-products including alum (aluminum sulfate), silicates, and low-pH water were discharged to the alum ponds. The by-products were initially discharged to the NE pond in the northeastern portion of SWMU #20 (east of the present-day Bangerter Highway) and were later discharged also to the L pond and the western ponds as these ponds were subsequently constructed. By 1981, Filtrol Corporation had ceased the activated clay catalyst production process and was converting operations to the production of fresh alumina catalyst and regeneration of spent alumina catalyst. The fresh alumina catalyst production process did not generate wastes that were discharged to the alum ponds. However, scrubber blowdown water and non-contact cooling water from the regeneration process were discharged to the eastern alum ponds between 1981 and 1989. No materials were discharged to the eastern alum ponds after 1989. Engelhard Corporation acquired the Facility in 1988 and ceased

operations at the site in 2000. Ninigret Technology Park acquired the property in portions during 2000 and 2002.

A Corrective Action Plan (CAP) was developed for the eastern alum ponds and approved by the DWMRC in January 2003 (MSE, 2003a). The CAP was based on practical and cost-effective treatment methods developed during similar corrective actions previously conducted within the western alum ponds. The corrective action approach involved application of lime or similar carbonate-based additives to neutralize the acidic alum materials and prevent additional alum liquor from forming. This process resulted in a stabilized end product that exhibits near neutral pH, low metals leachability, and adequate bearing capacities to allow for building and redevelopment for commercial/light industrial land use. The process effectively resulted in containment of metals within the treated soils, which were subsequently covered by clean fill material, buildings, pavement, and minor landscaped areas as the site was redeveloped. The corrective action procedures were implemented in phases beginning in January 2003, with final completion by September 2009.

2.0 REMAINING CONSTITUENTS

Metals concentrations exceeding site-specific background concentrations remain in the near-surface and subsurface soils on the site and in groundwater beneath the site. However, the level of risk to non-residential users of the property is well below the limits established at UAC R315-101 for current and future land use at the property, assuming no controls to minimize exposure. Additionally, the potential for adverse effects to ecological resources from site constituents is minimal, assuming the site were to remain undeveloped. Redevelopment of the site, including the construction of buildings, paved parking areas, and paved roadways, provides controls to eliminate exposure pathways and further reduce the potential for exposure to human and ecological receptors.

3.0 SITE RISK

3.1 Human Health Risk

A baseline human health risk assessment was conducted for the eastern alum ponds of Solid Waste Management Unit # 20 located east of Bangerter Highway (MSE, 2004a). This risk assessment was completed in accordance with Utah Administrative Code (UAC) R315-101 "Cleanup Action and Risk-Based Closure Standards," and is consistent with relevant U.S. Environmental Protection Agency (EPA) guidance. The risk assessment was conducted based on data collected according to a DWMRC-approved Sampling and Analysis Plan and Quality Assurance Plan (SAP/QAP) dated June 21, 2001. Chemicals detected in soil and groundwater were evaluated using the procedures outlined in the State of Utah Cleanup Action and Risk-Based Closure Standard (R315-101-5) and relevant EPA guidance. The soil and groundwater analytical results used in the risk assessment represent baseline conditions independent of corrective action

and future site redevelopment. All chemicals detected in soil and groundwater were evaluated in the risk assessment. If the chemical concentration of a solid sample exceeded its corresponding background concentration, it was retained for evaluation in the risk assessment. All chemicals detected in groundwater were retained for evaluation in the risk assessment.

The risk assessment and its SAP/QAP were designed to evaluate the human health risk due to exposure to volatile organic compounds and metals in soils and groundwater. However, volatile organic compounds were not detected in soil or groundwater and are, therefore, not potential chemicals of concern. Potential chemicals of concern in the eastern alum ponds include: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc.

A Site Conceptual Exposure Model was developed for the site to identify potential receptors and potential exposure pathways. Potential receptors include future construction workers, and future site workers in a commercial/light industrial land use scenario. Commercial land use exposure factors were used in the risk assessment to determine if excess human health risk exists in the absence of corrective action or controls provided by redevelopment. The exposure routes evaluated in the risk assessment are consistent with commercial land use and State of Utah Cleanup Action and Risk-Based Closure Standards. The potential exposure pathways evaluated in the risk assessment for a future construction worker include: incidental ingestion, dermal contact, and inhalation of particulates from alum affected surface and subsurface soils; and incidental ingestion and dermal contact of groundwater. The potential exposure pathways evaluated in the risk assessment for a future commercial site worker include: incidental ingestion, dermal contact, and inhalation of particulates from alum affected surface soils. These potentially complete exposure pathways were conservatively evaluated for the future commercial worker, assuming no controls (e.g., buildings, pavement, landscaping, etc.) are present. However, the redevelopment has rendered these pathways incomplete for the future commercial worker.

The human health risks associated with carcinogenic and non-carcinogenic chemicals of potential concern were estimated in the risk assessment. For carcinogens, risks are estimated as the probability of an individual developing cancer over their lifetime as a result of exposure to a carcinogen. Carcinogenic human health risk is expressed as a probability; for example 1×10^{-6} , means one-in-one million chance that an individual will develop an adverse effect. Non-carcinogenic risk is expressed as a hazard index. The hazard index is a ratio that, if greater than 1, may represent potential for non-carcinogenic health effects. EPA standardized risk assessment reporting tools (Standard Tables) were used to document the risk assessment. The Standard Tables document the majority of the data and assumptions used to evaluate risk, as well as the risks and hazards calculated (MSE, 2004a).

Quantitative results of the baseline risk assessment indicate that for the future commercial worker, the total carcinogenic risk (4×10^{-6}) is well below the action level (1×10^{-4}) that mandates corrective action, as set forth in Utah's Cleanup Action and Risk-Based Closure Standards.

Similarly, the total non-carcinogenic hazard index (0.1) for the future commercial worker is well below the hazard index standard of 1. The risk assessment assumed baseline conditions without any corrective action, engineering controls, or development to reduce or control exposure to site constituents. Therefore, under actual land use conditions that include controls provided by corrective action and site redevelopment, the health risk to future commercial workers is less than the values calculated in the baseline risk assessment.

For the future construction worker, the risk assessment indicates a total carcinogenic risk of 9×10^{-6} , well below the action level of 1×10^{-4} . The highest segregated non-carcinogenic hazard index for the future construction worker (1) does not exceed 1.

3.2 Ecological Risk

In addition to a human health risk assessment, Utah's risk-based closure rules require an ecological risk assessment unless a waiver is granted by DWMRC. Ninigret previously requested a waiver based on the lack of ecological receptors and habitat at the site under current and future land use conditions. DWMRC informed Ninigret that the future land use conditions (development for commercial/light industrial use) are considered similar to administrative controls, and as such an ecological risk assessment would need to be prepared to evaluate potential ecological effects that could occur if the site were to remain undeveloped. Accordingly, Ninigret developed an ecological risk assessment (ERA) that assumes that the site remains undeveloped (MSE, 2004b).

Using site-specific chemical data and an inventory of the biological community at the site and surrounding area, the ecological risk was quantified for a subset of measurement receptors likely to be exposed to the site in the shrub-scrub and aquatic food webs, assuming that the site remains undeveloped. For the purposes of the ecological assessment, in the shrub-scrub food web it is assumed that rodents colonize the site and serve as prey for carnivorous birds and mammals including the red-tailed hawk and the red fox. In the aquatic food web, it is assumed that mallard ducks are exposed to water, sediment, and plants in the nearby Lee Drain and Brighton Canal ditches. In addition, the ecological risk was quantified for the red fox in the aquatic food web by ingestion of water from the Lee Drain Ditch. Using highly conservative default values and assumptions, ecological screening quotients (ESQs) were calculated for each of the selected measurement receptors, and phytotoxicity to plants was evaluated using available soil phytotoxicity benchmarks.

Based on the results of the ERA, if the site remained undeveloped, the potential would exist for adverse effects to ecological resources from site constituents. However, the site has been redeveloped as part of actual land use, which effectively eliminates the establishment of habitat and the potential for exposure of ecological receptors to site constituents.

4.0 SITE MANAGEMENT REQUIREMENTS

The actual and future land use for the site is commercial/light industrial and does not include use for residential purposes. Based on the level of risk at the site with respect to actual and future land use, R-315-101-6 requires that the SMP contain appropriate management actions to minimize the potential for exposure to constituents. The following site management actions are designed to control site risks by minimizing the potential for exposure to site constituents.

4.1 Land Use Restrictions

The site is in an area already zoned for commercial/industrial (light manufacturing) land use. As such, the current zoning precludes development for residential land use. Additional land use restrictions will be imposed to prevent residential development (including childcare facilities and early education schools) and ensure that the property is used solely for commercial and industrial purposes in the future. Similarly, no edible crops will be grown on site without the approval of UDEQ. These restrictions will be imposed and enforced on the current property owner through deed notices and on subsequent property owners through an environmental covenant.

To minimize potential exposures to ecological receptors, the site development including roadways, buildings, and pavements, will be maintained to prevent the development of habitat for ecological receptors.

All portions of any waterway (such as the Brighton Canal or Lee Drain) shall not be in direct contact with treated material. Any waterway that currently exists or is subsequently placed within the footprint of the eastern alum ponds shall be lined or otherwise constructed such that a separation is maintained between the water within the waterway and the treated material thereby preventing direct contact between the water and the treated material. The integrity of this separation shall be maintained at all times.

4.2 Groundwater Use Restrictions

Restrictions will also be imposed to prevent use of groundwater from beneath the site.

This paragraph applies to cases in which groundwater is encountered during a normal work activity such as underground or in ground utility placement, where groundwater needs to be removed to facilitate that work activity. Groundwater management options are intended to comply with the principles of non-degradation in R315-101-3. In the event that temporary excavation dewatering is needed to facilitate a work activity, any groundwater to be extracted will be characterized for metals constituents and managed accordingly, unless it is to be returned directly to the aquifer from which it originated. Groundwater that is extracted may be returned directly to the aquifer from which it originated within the area adjacent to the ongoing work, so long as the return of that groundwater does not meet the criteria of an injection well as defined at Utah Administrative Code R317-7-2.53. Groundwater may be discharged offsite to a sanitary sewer

system with prior approval from the system's Publicly Owned Treatment Works (POTW) and may be discharged offsite to a storm water system, the Lee Drain, or the Brighton Canal with prior approval from the Utah Division of Water Quality. Groundwater that does not exceed background concentrations of constituents does not have a restriction on its disposition by DWMRC.

4.3 Hazard Notification

Controls provided by the site development (buildings, paved areas, landscaping, etc.) will render all potential exposure pathways to future commercial workers incomplete. Therefore, no notification beyond implementation of all other requirements of this SMP is warranted for future commercial workers. If initial commercial workers occupy a portion of the site before the development establishes sitewide exposure controls, potential exposure pathways may temporarily be complete (e.g., for commercial workers outside of buildings). Under these conditions, the risk levels for the commercial worker are significantly below the regulatory standard of 1×10^{-4} (carcinogenic risk) and non-carcinogenic hazard index of 1. However, because the potential for exposure will exist for the initial commercial workers, these workers will be notified of the existing hazard beneath the site and of methods to minimize the risks associated with the hazard.

Future construction workers who excavate into subsurface soils and/or groundwater will be exposed to constituents by the exposure pathways evaluated in the risk assessment. Under these conditions, the risk levels do not exceed the regulatory standard of 1×10^{-4} (carcinogenic risk) and non-carcinogenic hazard index of 1. Because the exposure pathways will be complete, future construction workers involved in excavation within the site shall be notified of the existing hazards and procedures to minimize the potential for exposure to site constituents. This notification may be provided in the form of a fact sheet, developed by the Owner, to be incorporated into the construction worker's health and safety program. A qualified person shall write the notifications.

4.4 Soil Excavation

Based on the risk levels estimated for future construction workers, exposure to constituents in soils through excavation for construction purposes will not result in risk levels exceeding the standards set forth in UAC R315-101-6(d). Therefore, restrictions on excavation are not necessary beyond hazard notification in accordance with Section 4.3 above. However, since the soils contain inorganic constituents at concentrations exceeding natural background levels, soils excavated from the property must be properly managed to ensure that they are not deposited at any offsite location used for residential purposes. Therefore, all excavated material from the property shall either remain on the property or be disposed at an appropriately licensed treatment, storage, and disposal (TSD) facility. Based on the characteristics of the untreated and treated alum materials, any soil resulting from excavation activities would not be classified as a hazardous waste and would likely be accepted for disposal as solid waste at a properly permitted landfill facility. Removal of soils off of the site to any other location or facility, including a soil recycling facility, will require UDEQ approval.

4.5 Enforcement

The above site management actions are intended to follow title to the land in perpetuity through a deed notice and shall apply to and bind all subsequent property owners unless subsequent determinations by the Utah Division of Solid & Hazardous Waste or its successors indicate that the remaining level of risk is sufficiently low that the site management requirements may be reduced or eliminated.

The above site management requirements shall be imposed and enforced on the current owner pursuant to an Environmental Covenant. Following approval of this Site Management Plan, the owner will file and record the Environmental Covenant, providing notice of its obligations concerning access and site management requirements on the property. Additionally, effective the date that this document is recorded in the Salt Lake County Recorder's Office, each deed, title or other instrument of conveyance conveying an interest in the property executed by the owner or its successors in title to the property shall include a notice stating that the property is subject to this Site Management Plan and shall reference the recorded location of the Site Management plan and the restrictions applicable to the property under the Site Management Plan. The above site management requirements are intended to follow title to land in perpetuity unless subsequent determinations by the DWMRC or its successors indicate that the remaining level of risk to human health and the environment on the site is sufficiently low that the site management requirements may either be reduced or eliminated in their entirety.

5.0 PROPERTY ACCESS

Commencing on the date of approval of this Site Management Plan and in accordance with Paragraph 59 of the Stipulation and Consent Agreement No 92060130 ("Consent Agreement") between the Utah Solid and Hazardous Waste Control Board ("Board") and Engelhard Corporation, the predecessor-in-title to the property, all activities conducted by the Property Owner under this Site Management Plan shall be subject to inspection and enforcement by the Board in accordance with procedures in the Utah Solid and Hazardous Waste Act, Section 19-6-101 et seq., Utah Code Annotated (1953 as amended). The Property Owner shall provide the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control and its representatives and its authorized contractors, with access at all reasonable times to the property for the purpose of monitoring, sampling and observing activities carried out under the Site Management Plan. These individuals shall conduct themselves in a safe and prudent manner in accordance with the health and safety standards of the Utah Department of Environmental Quality, Division of Waste Management and Radiation Control.

6.0 MONITORING REQUIREMENTS

Monitoring to ensure compliance with land use restrictions, groundwater use restrictions, limited excavation restrictions, and hazard notifications shall be the responsibility of the Property Owner

and/or its assigns. These site management actions will be implemented concurrently with the construction and development of the site. Documentation of the state of compliance with these site management requirements is to be updated annually and submitted to DWMRC upon request.

7.0 PROCEDURES IF SMP REQUIREMENTS ARE BREACHED

The stated site management requirements provide for continued protectiveness of human health and the environment based on current and future land use. If and when the Property Owner and /or its assigns (Property Owner) becomes aware of a deviation from the site management plan requirements the Property Owner shall notify DWMRC within five (5) calendar days of their becoming aware of the deviation. The Property Owner will submit to DWMRC a written report within twenty-five (25) days, detailing the nature of the deviation and the Owner's evaluation. The Property Owner and DWMRC will collectively re-evaluate whether the existing site management practices compromise the level of protection afforded by the original site management requirements and, if so, the need for alternate site management requirements will be evaluated to provide a comparable level of protection. Any proposed modification to the site management plan requirements will require DWMRC approval.

8.0 REFERENCES

- Millennium Science & Engineering, 2004a. *Responses to Division Comments on Western Alum Ponds Corrective Action Report, Former Engelhard Facility, Salt Lake City, Utah* (January 2004)
- Millennium Science & Engineering, 2004b. *Alum Sludge Stabilization Corrective Action Report, Eastern Alum Ponds Initial Treatment Area, Former Engelhard Facility, Salt Lake City, Utah* (Interim Draft, May 2004)
- Millennium Science & Engineering, 2004c. *Site Management Plan for the Western Alum Ponds (Western Portion of SWMU #20), Engelhard Facility, Salt Lake City, Utah* (Final Version, June 2004)
- Millennium Science & Engineering, 2004d. *Human Health Risk Assessment, Eastern Alum Ponds, Former Engelhard Facility, Salt Lake City, Utah* (July 2004)
- Millennium Science & Engineering, 2004e. *Ecological Risk Assessment, Eastern Alum Ponds, Former Engelhard Facility, Salt Lake City, Utah* (July 2004)
- Millennium Science & Engineering, 2003a. *Eastern Alum Ponds Corrective Action Plan, Former Engelhard Facility, Salt Lake City, Utah* (January 2003)

Site Management Plan, Former Eastern Alum Ponds Area

Former Engelhard Facility ■ Salt Lake City, Utah

June 17, 2022 ■ Terracon Project No. 61087229



Millennium Science & Engineering, 2003b. *Alum Sludge Stabilization Corrective Action Report, Western Alum Ponds, Former Engelhard Facility, Salt Lake City, Utah* (February 2003)

Millennium Science & Engineering, 2003c. *Ecological Risk Assessment, Former Engelhard Facility, Western Alum Ponds, Salt Lake City, Utah* (April 2003, Revised August 2003)

Millennium Science & Engineering, 2002. *Addendum to Corrective Action Plan (including DSHW comments and responses), Engelhard Facility, Salt Lake City, Utah* (September 2002)

Millennium Science & Engineering, 2001a. *Alum Sludge Stabilization Corrective Action Plan, Engelhard Facility, Salt Lake City, Utah* (March 2001)

Millennium Science & Engineering, 2001b. *Sampling & Analysis Plan and Quality Assurance Plan for Risk Assessment of the Western Alum Ponds, Engelhard Facility, Salt Lake City, Utah*, (March 9, 2001, Revised June 21, 2001)

Millennium Science & Engineering, 2001c. *Sampling & Analysis Plan/Quality Assurance Plan for Characterization of Solid Waste Management Units #1, #2, and #20, Engelhard Facility, Salt Lake City, Utah*, (May 2001, Revised June 21, 2001)

Millennium Science & Engineering, 2001d. *Baseline Human Health Risk Assessment for the Western Alum Ponds, Engelhard Facility, 2550 West Andrew Avenue, Salt Lake City, Utah* (October 10, 2001)

APPENDIX A

Former Eastern Alum Ponds Area Map and Legal Description

Oversized Drawings/Maps

associated with this document
are located elsewhere in the
DSHW files.

For assistance, please contact
the GRAMA Coordinator.



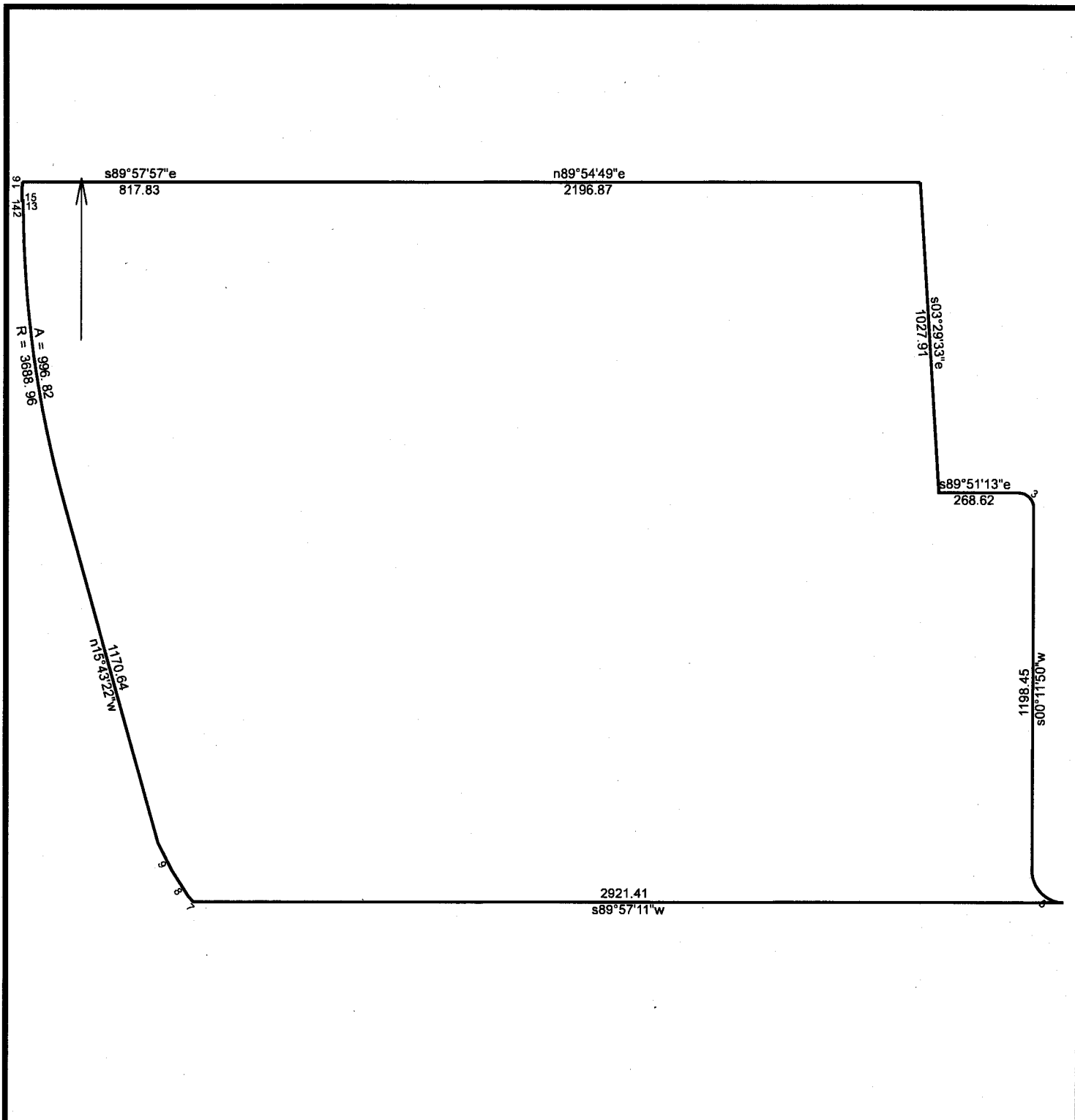
June 15, 2022

**NIN TECH
East Remediation Area Description**

A parcel of land located in the Northwest Quarter of Section 17 and the Northeast Quarter of Section 18, Township 1 South, Range 1 West, Salt Lake Base and Meridian, more particularly described as follows:

BEGINNING at the Northwest corner of said Section 17 (the basis of bearings is North 89°54'49" East 2670.69 feet measured between the Northwest corner and the North Quarter of said Section 17), and running thence North 89°54'49" East 2196.87 feet along the north line of said Section 17; thence South 03°29'33" East 1027.91 feet; thence South 89°51'13" East 268.62 feet to a point of curvature with a 50.00 foot radius to the right; thence southeasterly 78.58 feet along the arc of said curve through a central angle of 90°03'03" (chord bears South 44°49'41" East 70.74 feet); thence South 00°11'50" West 1198.45 feet to a point of curvature with a 106.00 foot radius to the left; thence southeasterly 166.96 feet along the arc of said curve through a central angle of 90°14'39" (chord bears South 44°55'29" East 150.23 feet); thence South 89°57'11" West 2921.41 feet; thence North 42°08'12" West 24.44 feet; thence North 32°51'07" West 101.85 feet; thence North 27°01'57" West 101.98 feet; thence North 15°43'22" West 1170.64 feet to a point of curvature with a 3688.96 foot radius to the right; thence northerly 996.82 feet along the arc of said curve through a central angle of 15°28'56" (chord bears North 07°58'54" West 993.79 feet); thence North 00°14'26" West 15.26 feet; thence South 89°58'06" West 3.43 feet; thence North 00°27'29" West 29.51 feet; thence South 89°32'31" West 0.37 feet to a point on a 539.00 foot radius non-tangent curve to the right; thence northerly 30.97 along the arc of said curve through a central angle of 03°17'31" (chord bears North 01°45'31" East 30.97 feet) to the north line of said Section 18; thence along said line South 89°57'57" East 817.83 feet the POINT OF BEGINNING.

Contains 7240274.23 square feet or 166.214 acres, more or less.



NIN TECH East Remediation Area 6/14/2022

Scale: 1 inch = 449 feet File: nin tech east remediation.ndp

Tract 1: 166.2137 Acres, Closure: n73.4242e 0.01 ft. (1/999999), Perimeter=11152 ft.

01 s03.2933e 1027.91	12 n00.1426w 15.26
02 s89.5113e 268.62	13 s89.5806w 3.43
03 Rt, r=50.00, delta=090.0303, arc=78.58, chord=s44.4941e 70.74	14 n00.2729w 29.51
04 s00.1150w 1198.45	15 s89.3231w 0.37
05 Lt, r=106.00, delta=090.1439, arc=166.96, chord=s44.5529e 150.23	16 Rt, r=539.00, delta=003.1731, arc=30.97, chord=n01.4531e 30.96
06 s89.5711w 2921.41	17 s89.5757e 817.83
07 n42.0812w 24.44	18 n89.5449e 2196.87
08 n32.5107w 101.85	
09 n27.0157w 101.98	
10 n15.4322w 1170.64	
11 Rt, r=3688.96, delta=015.2856, arc=996.82, chord=n07.5854w 993.79	