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October 18, 2012

Anthony L. Lopes, P.E.
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New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2915

**Reference: Work Plan
 Remedial Program Supplement
 Sodium Lactate Injection Program for RAOC-1
 Former Allegany Bitumens Belmont Asphalt Plant
 Brownfield Site ID No.: C902019
 Town of Amity, Allegany County**

Dear Mr. Lopes:

On behalf of Blades Holding Company, Inc. (Blades), Stantec Consulting Services Inc. (Stantec) has prepared this Work Plan for the Former Allegany Bitumens Belmont Asphalt Plant located at 5392 State Route 19 in the Town of Amity, Allegany County, New York (Site). This Work Plan describes implementation of a proposed program of sodium lactate injection to address residual groundwater impacts in the vicinity of the former laboratory building (RAOC-1). We look forward to the NYSDEC's approval of this Work Plan so that we can move forward with this injection program beginning November 5, 2012.

Sincerely,

STANTEC CONSULTING SERVICES INC.

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**WORK PLAN
Remedial Program Supplement
Sodium Lactate Injection Program for
RAOC-1
Former Allegany Bitumens Belmont
Asphalt Plant
BCP Site # C902019
5392 State Route 19
Amity, Allegany County, New York**

Prepared for:

New York State Department of
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Prepared on behalf of:

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**WORK PLAN
REMEDIAL PROGRAM SUPPLEMENT
SODIUM LACTATE INJECTION PROGRAM FOR RAOC-1**

CERTIFICATION

I, Peter Nielsen, certify that I am currently a NYS registered professional engineer and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).


Signature


Date 10/18/12

**WORK PLAN
REMEDIAL PROGRAM SUPPLEMENT
SODIUM LACTATE INJECTION PROGRAM FOR RAOC-1**

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1.0 Introduction

On behalf of Blades Holding Company, Inc. (Blades), Stantec Consulting Services Inc. (Stantec) has prepared this Work Plan for the Former Allegany Bitumens Belmont Asphalt Plant located at 5392 State Route 19 in the Town of Amity, Allegany County, New York (Site). This Work Plan describes implementation of a proposed program of sodium lactate injection to address residual impacts contamination in the vicinity of the former laboratory building (RAOC-1).

Trichloroethene (TCE) contamination was found in soil and groundwater in the vicinity of the former laboratory building where TCE was historically used in asphalt testing processes. An IRM was conducted in November 2011-January 2012 for which this area was identified as RAOC-1. Soil excavation was conducted to remove the source and a sodium lactate solution was placed in the excavation and in trenches downgradient of the excavation. Based on three rounds of post-IRM groundwater sampling results (March, June and September 2012), it is proposed that a supplemental injection of sodium lactate would be beneficial for further reducing source area and downgradient chlorinated volatile organic compound (CVOC) concentrations in groundwater.

The proposed supplemental remediation program will employ enhanced reductive dechlorination (ERD). A solution of a carbon source material, sodium lactate, will be injected in the subsurface to provide reducing conditions and a source of electrons that will enhance the breakdown of residual contaminants by naturally occurring bacteria. The ERD program will make use of existing monitoring wells and Geoprobe points to inject a solution of sodium lactate in the areas affected by residual contamination. Sampling and analysis activities will be performed to monitor the effectiveness of the subsequent enhanced biodegradation process and site conditions at the end of the ERD program.

This work plan describes the scope of work to be completed as part of the ERD program. The design of the program is based on Stantec's understanding of Site conditions and the results of the previously conducted ERD bench-scale treatability study (results of which were previously submitted to the New York State Department of Environmental Conservation [NYSDEC]).

2.0 Design Assumptions

The following assumptions have been used in design of the ERD program.

- The primary area of remaining contamination is at (BS-2R) and immediately downgradient (MW-25) of the laboratory area source area.
- TCE along with its daughter products are the primary contaminants of concern identified in groundwater.
- Based on the results of the treatability testing performed, ERD operations will be conducted using sodium lactate as the electron donor solution.
- The soil in the injection area consists of excavation backfill (gravel and formerly surficial soils, silty gravels) as well as in place silty gravels overlying clayey silts and silty clays.
- The ERD process will be applied to address saturated intervals in overburden.
- Depth to groundwater is approximately 0 to 14.8 feet bgs in the injection area.
- Groundwater flow is to the northeast in the proposed treatment area.
- Injection of sodium lactate into the subsurface will be completed using existing monitoring wells and Geoprobe injection points.

3.0 REMEDIAL ACTIVITY WORK SCOPE

Remediation activities will be conducted in the following phases:

- project preparation and permitting;
- electron donor injection;
- post-injection monitoring; and
- evaluation of results.

Each phase of the proposed ERD remediation program is discussed in greater detail below.

3.1 PROJECT PREPARATION, PERMITTING AND BASELINE SAMPLING

During this phase the following work will be completed:

- procurement of equipment and materials;
- scheduling and coordination activities; and
- acquisition of required permits.

3.1.1 Underground Injection Control Permit

The ERD remediation activities will involve the injection of an electron donor solution into the subsurface to enhance in-situ biodegradation. Injection of treatment solutions into groundwater for remedial purposes is permitted by rule under 40 CFR §144 since it involves a beneficial use, Class V, underground injection control (UIC) well for aquifer remediation (classified as a category 5X26 well in EPA 570/9-87-006). However, there are inventory reporting requirements as described in 40 CFR §144.83.

Because New York is a direct implementation state, USEPA is in charge of the Class V UIC program in New York. The inventory reporting requirements to USEPA can be satisfied by submitting a completed Office of Management and Budget No. 2040-0042 form to the UIC Program Director in USEPA Region 2. This form may be submitted before or after installation of the Class V UIC well. The wells to be used for injection during the planned ERD program are existing (previously-installed) monitoring wells and temporary Geoprobe injection points.

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**REMEDIAL PROGRAM SUPPLEMENT
SODIUM LACTATE INJECTION PROGRAM FOR RAOC-1**

3.2 ELECTRON DONOR INJECTION OPERATIONS

The following conceptual design is proposed for the ERD injection activities. Any proposed modifications to the conceptual design will be submitted for NYSDEC approval prior to initiation of the injection activities.

The electron donor solution will be prepared in a batch process using potable water brought to the site by the Geoprobe contractor. The water will be pumped into a large capacity poly tank equipped with a submersible pump and sufficient sodium lactate added to provide a 40,000 mg/l solution.

The submersible pump in the batch tank will connect to a distribution line, which may be manifolded. The injection plumbing will be configured to connect to the individual injection points.

The existing monitoring wells to be utilized for injection will include BS-2R, MW-8, and MW-25. The Geoprobe injection locations are depicted on Figure 1. The injection will include:

- In total, 1,268 pounds of sodium lactate will be injected. That is, 195+/- gallons of 60% sodium lactate solution. This solution will be diluted to a 40,000 mg/l solution for a total injection volume of 3,800+/- gallons:
 - 1,000+/- gallons of 40,000 mg/l solution will be injected into existing wells BS-2R and MW-25,
 - 500+/- gallons of 40,000 mg/l solution will be injected into existing well MW-8, and
 - 100+/- gallons of 40,000 mg/l solution will be injected into each of 13 Geoprobe boreholes.

The concentrations and volumes selected for the injection are based on typical design parameters, adjusted for site conditions and remedial objectives. It is proposed to conduct the injection program beginning on or about November 5, 2012.

3.3 POST-INJECTION MONITORING

Upon completing the electron donor injection, a post-injection monitoring program will be initiated to evaluate the effectiveness of the treatment. The following wells will be monitored approximately one month after electron donor injection operations are completed and on a quarterly basis thereafter:

- BS-2R
- MW-8
- MW-25
- MW-27

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SODIUM LACTATE INJECTION PROGRAM FOR RAOC-1

It is anticipated that the monthly groundwater monitoring event will fall near the regularly scheduled quarterly event (December 2012), therefore, these events will be combined. Monitoring wells BS-3 and MW-28D will be sampled on an annual basis, as previously agreed to with NYSDEC. Depending on the results of the monthly, quarterly or annual sampling results, changes to the sampling program may be requested from NYSDEC.

Groundwater samples will be collected using low-flow/low-stress sampling procedures. Unless data received from future sampling rounds dictates a change in parameters, which would be proposed to NYSDEC prior to implementation, the following field and laboratory analytical parameters will be included for each sampling event:

- pH (field measurement)
- ORP (field measurement)
- Conductivity (field measurement)
- Temperature (field measurement)
- DO (field measurement)
- Dissolved ferrous and total iron (field measurement) (filtered in field)
- VOCs (8260B)
- TOC (EPA 415.1)
- Na+ (6010)
- Dissolved Mn (6010/7000) (filtered in field)
- Dissolved As (6010/7000) (filtered in field)

In addition to the parameters described above, samples of groundwater may be collected from well BS-2R or MW-25 for analysis of *dehalococcoides* and the VC reductase gene.

Quality Assurance\Quality Control levels and procedures will be the same as those in effect for the post-IRM groundwater monitoring activities. Refer to Section 4.0 for additional information on sample collection, preservation and analytical methods.

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**REMEDIAL PROGRAM SUPPLEMENT
SODIUM LACTATE INJECTION PROGRAM FOR RAOC-1**

4.0 ANALYTICAL METHODS

As specified in Section 3 above, groundwater samples collected during the ERD program will be analyzed in the field for specific field parameters, and some will be sent to TestAmerica and SiREM laboratories for additional laboratory analysis. The various analytes, methods, sample containers, preservatives, and holding times for these samples are listed in Table 1 below. (As specified in Section 3 above, only certain wells may be analyzed for *dehalococcoides* and the VC reductase gene.)

TABLE 1
Analytical Parameters and Methods

Analyte(s)	Method	Sample Container	Preservative	Holding Time
Temperature	Field	None	None	NA
Conductivity	Field	None	None	NA
pH	Field	None	None	NA
DO	Field	None	None	NA
ORP	Field	None	None	NA
Dissolved Ferrous and Total Iron	Field	None	None	NA
VOCs	EPA 8260B	3-40mL glass vials	HCl, keep cool ¹	14 days
TOC	EPA 415.1	1-250mL amber bottle	keep cool ¹ , H ₂ SO ₄	28 days
Dissolved Mn, As	EPA 6010/7000	1- 1L HDPE bottle	HNO ₃ to pH < 2 (lab)	6 months
Na ⁺	EPA 6010/7000	1- 1L HDPE bottle	HNO ₃ to pH < 2 (lab)	6 months
<i>Dehalococcoides</i> and VC reductase ²	PCR	1 – 1L HDPE bottle	Keep cool ¹	14 days

Notes:

¹keep cool at 4° C

²Analyzed by SiREM Laboratories, Inc.

NA = Not Applicable

5.0 DATA MANAGEMENT

Laboratory analyses for most ERD process parameters will be performed by TestAmerica. Test America will receive the samples, analyze the samples, and submit the results to Stantec electronically in both PDF and NYSDEC EDD formats. Analytical reports will be prepared in accordance with the NYSDEC Analytical Services Protocol (ASP) Category B requirements. All analytical data will undergo a data usability evaluation (DUSR).

Parameters measured in the field will include pH, ORP, conductivity, DO, temperature, and dissolved ferrous and total iron. The results for these parameters will be recorded on field log sheets.

Analyses for dehalococoides and the VC reductase gene will be performed by SiREM. Results will be supplied to Stantec as a PDF file.

The data from the various field and laboratory analyses will be summarized and presented in tabular and graphical form in project progress reports. Original analytical reports will be included as appendices of submitted progress reports. An electronic database file of laboratory analysis data will be prepared for submittal to the NYSDEC in the NYSDEC EDD format.

6.0 EVALUATION AND REPORTING OF RESULTS

Stantec will prepare a post-injection summary report detailing the methodologies, activities, and results obtained during implementation of the ERD technology. The report will cover electron donor injection activities and the post-treatment groundwater sampling results one month following ERD injection. Subsequent quarterly, semi-annual, or annual ERD post-injection performance monitoring data will be provided in project progress reports, as appropriate.

Results will be evaluated in accordance with DER-10 guidance to determine whether residual contamination present in the target area is being or has been reduced to a level that meets the remedial action objectives.



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Consultants

Legend

LEGEND

- PROPERTY LINE
- FENCE
- INDEX AND INTERMEDIATE ELEVATION CONTOUR
- RAOC-1
- REMEDIAL AREA OF CONCERN EXCAVATION
- MW-28D
- MONITORING WELL
- WATER SUPPLY WELL
- UTILITY POLE
- GEOPROBE BORING INJECTION LOCATION
- MW-8

Revision _____ By _____ Appd. _____ YY.MM.DD

WORK PLAN _____ **SRS** **MPS** **12.10**
 Issued By _____ Appd. _____ YY.MM.DD

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Permit-Seal

Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title

SODIUM LACTATE
INJECTION LOCATION MAP

Project No.
 190500593

Scale
 AS SHOWN

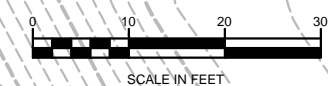
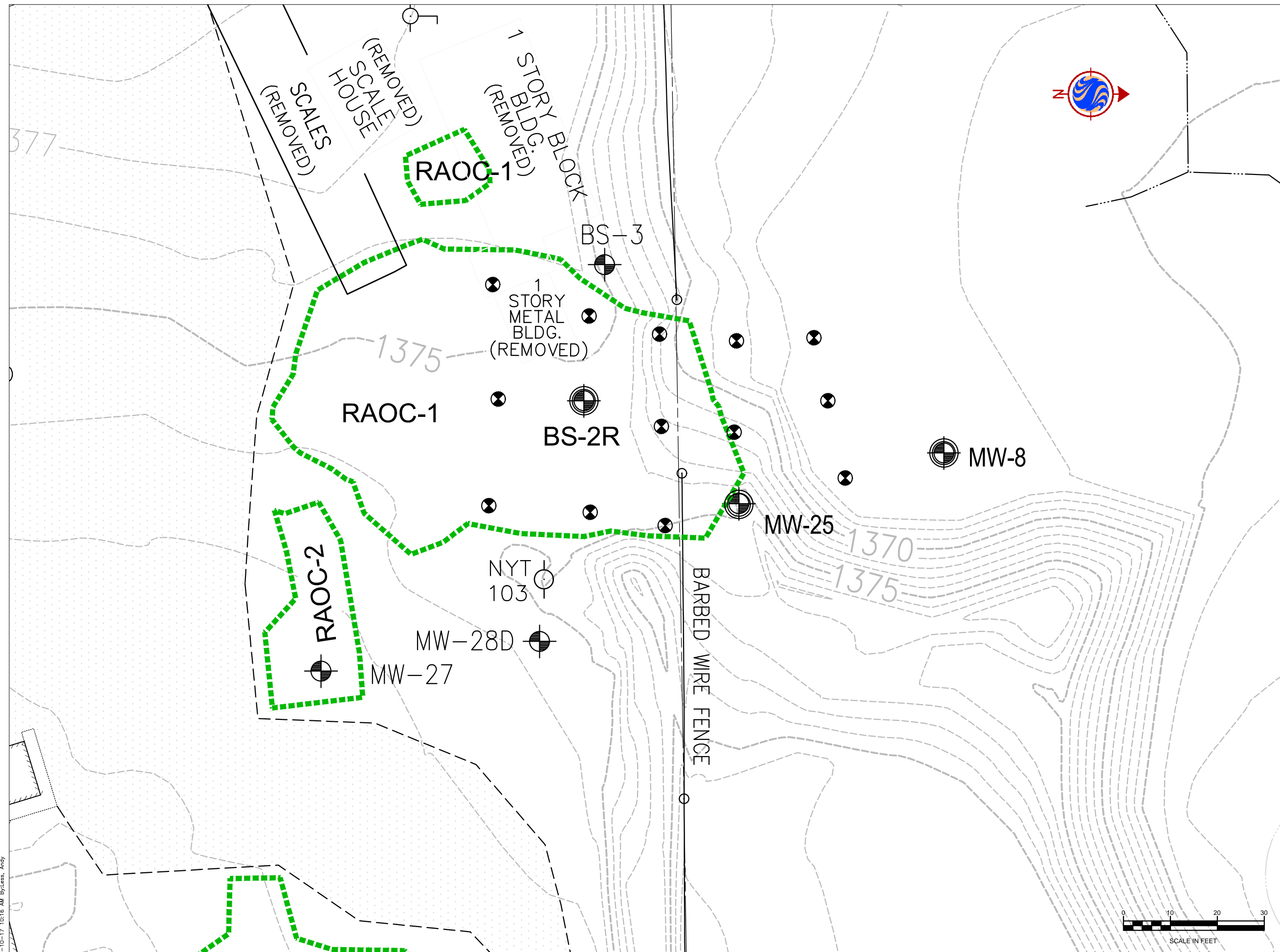
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Revision

Figure 1

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