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RACER Trust

Revised Work Plan for Treatability and Pilot Studies of Calcium Oxide Treatment

1723 North Washington Street
Kokomo, Indiana

Former GM Delco Plant 5
USEPA ID IND000806844

August 14, 2014

ARCADIS

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Revised Work Plan for Treatability and Pilot Studies of Calcium Oxide Treatment

Former GM Delco Plant 5
1723 North Washington Street
Kokomo, Indiana

Prepared for:
RACER Trust

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Our Ref.:
IN000884.2013

Date:
August 14, 2014

Figures

Acronyms

TCE	tricholoroethene
DCE	dichloroethene
VOC	volatile organic compound
cVOC	chlorinated VOC
ft bgs	feet below ground surface
PPE	personal protective equipment
SDS	safety data sheet
JSA	job safety analysis
EPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
CMP	Corrective Measures Proposal

1. Introduction

ARCADIS U.S. Inc. (ARCADIS) has prepared this *Work Plan for Treatability and Pilot Studies of Calcium Oxide Treatment* (the Work Plan) for the Former GM Delco Plant 5 (the Site). The Site is located at 1723 North Washington Street within the city of Kokomo in Howard County, Indiana; see Figure 1 for a Site location map. The intent of the proposed work is to evaluate the use of calcium oxide (CaO) to treat an on-Site area of soil impacted with chlorinated volatile organic compounds (cVOCs) consisting of trichloroethene (TCE) and its associated daughter products 1,1-dichloroethene (DCE); cis-1,2-DCE; trans-1,2-DCE; and vinyl chloride. The observations and data will be used for full scale design.

1.1 Selected Soil Remedy

A Corrective Measures Proposal (CMP) was submitted on December 6, 2011 to the USEPA which evaluated potential options to reduce concentrations of cVOCs in soil at the Site. The CMP has not been approved by EPA Region V. Remedial options that were evaluated include:

- institutional controls,
- engineering controls,
- phytoremediation,
- direct excavation and disposal,
- CaO mixing and reuse of soil, and
- electrical resistive heating (ERH).

On-Site treatment of soil using CaO was identified as the selected alternative in the CMP. The footprint of the impacted soil will be divided into treatment cells of manageable soil volumes. The overburden soil (to a depth of 8 feet) will be excavated and reserved until treatment is completed. The CaO remedy will utilize multiple lifts to treat soils within each treatment cell. CaO will be 1) placed on top of the soil lift to be treated, 2) mixed with conventional construction equipment, and 3) hydrated with water to activate the reaction between the CaO and water. The exothermic reaction will volatilize the cVOCs. Once the CaO is hydrated, the treated soil will be stockpiled to allow treatment of the next lift. After treatment is complete, samples will be collected from the stockpiled soil to verify that TCE concentrations are below the quantitative objective for the treated soils of ≤ 400 mg/kg as outlined in Table 5 of the CMP submitted on December 6, 2011. The treated soil will be placed back into the excavation and covered by the excavated overburden.

1.2 Objectives

The objectives of the Treatability Study are to:

- evaluate the effectiveness of CaO to reduce soil concentrations of cVOCs present in the Site soils which require remediation; and
- determine the parameters for pilot- and full-scale design and implementation including:
  - target percent CaO,
  - target percent water,
  - percent contaminant reduction,
  - target temperature, and
  - time to completion.

The objectives of the Pilot Study are to:

- evaluate the pilot-scale effectiveness of CaO to remove concentrations of cVOCs present in Site soils;
- determine the optimal mixing methodology(in situ or ex situ) to ensure thorough distribution of CaO;
- determine the concentration of particulate matter, lead and VOCs observed at the property lines during treatment; and
- determine if an additional vapor control measures are necessary

2. Site Conditions

2.1 Geology

The USDA Soil Survey of Howard County, Indiana, indicates that the soil type at the Site is in the Crosby Series and specifically classified as the Crosby silt loam. The Crosby Series is described as poorly drained soils that formed in thin deposits of loess and in underlying glacial till. Typically, this soil has a high water capacity and a low permeability.

The unconsolidated sediments encountered during historical subsurface investigations are comprised of plastic clay loam underlain by a sequence of three sand and gravel layers separated by hard clay till layers which is consistent with the USDA Soil Survey and published regional geology. The sand and gravel layers have been designated as aquifer units S1 through S3, with unit S1 being the shallowest and unit S3 being the deepest. Geologic cross-sections and a cross-section reference drawing are presented as Figures 2 through 4.

2.2 Constituent Distribution

ARCADIS performed a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Site that successfully delineated the horizontal and vertical distribution of cVOCs in the soil. Results of the RFI are summarized in the RFI Report that was submitted to the USEPA in 2009. The data from this investigation showed the highest cVOC concentrations requiring remediation are contained in soils in the northwestern quarter of the Site. Specifically, the treatment area has been designated to treat soils with impacts that exceed 400 mg/kg TCE. The proposed full scale treatment area is illustrated on Figure 5 and is approximately 12,300 square feet in aerial extent.

3. Calcium Oxide Treatability Study

Soil to be used during the treatability study was collected from the pilot study treatment cell, in the vicinity of boring location SB-0757 (Figure 5).

3.1 Soil Sample Collection

The treatability study sample was collected after completing utility locate procedures to ensure no utilities were in the excavation areas. ARCADIS cleared subsurface utilities by completing the following:

- The Indiana One Call service was contacted at least 48 hours prior to beginning the field activities to provide markings for public utilities,
- Bloodhound Underground was contracted to locate private utilities in the work area prior to subsurface work, and

A soil excavation was completed at the Site within the pilot study treatment cell, B4, as shown on Figure 5. Approximately two cubic feet of soil was collected from the impacted zone (from approximately 12-14 ft bgs). The TCE concentration at SB-0757 was 1,900 mg/kg in the 12-14 ft bgs interval. Soil recovered for the treatability study were packed tightly into 1-gallon buckets, sealed, placed on ice, and shipped overnight to the ARCADIS Treatability Laboratory in Durham, North Carolina where samples will be refrigerated until the treatability study commences.

3.2 Bench Scale Treatability Study

ARCADIS will complete a bench scale treatability study to determine the optimal methodology for mixing the soils, CaO and water. The bench test will simulate field conditions and vary CaO percentages and water percentages to determine the approximate dosing for pilot and full scale design and implementation. Ambient air levels are not included in the list of measured parameters during the bench test because ambient air monitoring will be conducted during the field portion of the pilot test. The varied input

parameters and conditions experienced at the field scale are too difficult to model and mimic during the bench scale of the treatability study to adequately derive valid data for ambient air monitoring.

3.2.1 Soil Mixing Methodology

A homogenized soil sample will be created from the soils collected in the field. Homogenization will be done on cold soil to minimize cVOC volatilization. Following homogenization, soil will be packed into glass jars to discourage further cVOC loss and refrigerated until the treatability study commences. Triplicate baseline samples for Method 8260 will be utilized to characterize the cVOC baseline condition following the preparation of the treatability study soil homogenate. The 8260 analysis will be conducted at a subcontracted analytical laboratory with the proper qualifications associated with the State of Indiana.

The bench test will determine the proper mixing for the site specific soil to maintain an even distribution of CaO and water. Simulated mixing will determine if the addition of water during the excavation would be beneficial for CaO distribution. Additionally, the optimal moisture content for the reaction will be determined

3.2.2 Bench Test Sampling Plan

Samples will be collected to track performance of each step of the bench test. Samples will be collected and analyzed for the following parameters and will be determined and recorded by ARCADIS Treatability Laboratory staff:

- CaO dosing will be tested at 10%, 15%, and 20%.
- water addition for mixing,
- percent moisture,
- temperature rise,
- final temperature, and
- time to completion.

At the completion of each experiment, duplicate soil samples for cVOC analysis will be collected and shipped to a subcontracted analytical laboratory for analysis by Method 8260. Treatment efficiency will be determined by comparing duplicate baseline 8260 results with the duplicate 8260 results at the conclusion of each experiment.

4. Pilot Calcium Oxide Treatment

The pilot CaO treatment will be completed following the bench scale treatability study. The design parameters will be developed from the bench scale test.

4.1 Treatment

The treatment cell will be sized to be a manageable volume of soils. It is anticipated that a manageable footprint for full scale implementation would require that each treatment cell will be approximately 1000 square feet and 250 cubic yards of soils. Therefore, a treatment cell will consist of multiple lifts with horizontal dimensions of 30 feet by 30 feet and 7 to 10 feet vertically. Based on the logs from previously completed soil borings and monitoring wells. It is anticipated that the S1 unit is encountered between 17 and 19 ft bgs. The vertical extent of the treatment cell will extend until two feet above the S1 unit. Figure 5 illustrates the location of the proposed treatment cell.

4.1.1 Utility Clearance

The location of the pilot treatment cell is dependent on proper utility clearance, and may be adjusted in order to avoid underground or overhead utilities. At a minimum, ARCADIS will clear subsurface utilities by completing the following:

- Contacting the One Call service no more than seven days and at least 48 hours prior to beginning field activities to provide markings for public utilities,
- Hiring a private utility locator to locate all private utilities in the work area prior to subsurface work, and
- Ground penetrating radar

4.1.2 Removal of Overburden

Prior to the commencing the treatment, the overburden will be removed and stockpiled nearby as this material is minimally impacted with cVOCs. It is anticipated that the upper eight feet of soil will be removed and stockpiled. Stockpiled soils will be surrounded with silt fencing for sediment control and covered in plastic sheeting to control dust migration.

4.1.3 In-Situ Mixing

The impacted soil lifts will be combined in-situ with water and CaO based on the data collected during the bench scale treatability study as guidelines for mix ratios. In-situ mixing of the soil lifts with the CaO will be performed initially, and then removed from the subsurface and stockpiled within the soil corrective measures boundary during reaction and off-gassing process. Temperatures and off gas concentrations (via a 9.8 eV photo-ionization detector [PID]) of the mixture will be monitored during treatment.

4.1.4 Treatment Monitoring and Data Analysis

4.1.4.1 Pre-Treatment Soil Monitoring

Once the overburden has been removed, a series of soil samples will be collected to establish baseline concentrations of TCE and its associated daughter products within the treatment cell. As stated above, the treatment cell will be 30 feet by 30 feet and 7 to 10 feet in thickness. To establish a representative baseline of the treatment cell, a total of 4 soil samples will be collected via a grab sample to a maximum depth of 7 feet on a 15 by 15 foot grid spacing. Soil from each sampling location will be collected and analyzed for VOCs via US EPA Method 8260. Samples will be analyzed on a 48-hour turn-around time.

4.1.4.2 Treatment Soil Monitoring

Once the in-situ soil mixing has been completed and the soil stockpiled, a series of soil samples will be collected to verify the reaction rate anticipated from the treatability test. Soil samples will be collected from the stockpile at timed intervals and analyzed for VOCs via US EPA Method 8260. It is anticipated that four soil samples will be collected from the stockpile during each timed interval sampling event in order to provide a mean concentration during the reaction. The sampling will be completed when the temperature of the stockpile decreases below the temperature determined during the treatability study that the exothermic reaction has completed. Samples will be analyzed on a 48-hour turn-around time. These results will be compared to the pre-treatment baseline sampling data in order approximate the relative percent reduction in the concentrations of TCE and its daughter products within the treatment cell. This percent reduction will be used to determine the effectiveness of the initial treatment event, and the ultimate success of the pilot test.

4.1.4.1 Data Analysis

Following the receipt of CaO treatment data, the laboratory data will be analyzed as individual samples and a mean will be calculated for confirmation of cell treatment. Overall treatment success will be measured on the mean of the final treatment analytical data. Data collected will be presented in the Corrective Measures Work Plan.

4.1.5 Health and Safety

The Site-specific Health and Safety Plan will be updated to include hazards and controls for both the on-site worker and the off-site resident associated with the CaO treatment.

4.1.5.1 Onsite Worker

Applicable health and safety measures will be in place for on-site workers, including appropriate PPE and containment. PPE for CaO activities will include a Tychem suit, inner nitrile gloves, outer rubber gloves, chemical resistant boots, and respirator. An eye wash station and safety shower (or equivalent) will be located on-site during field activities, and proper functioning of the equipment will be confirmed each day prior to commencement of field activities. In addition to spill kits and a potable water supply for diluting or washing down a small release, a neutralizing solution will be available in spray bottles during the pilot study for dermal contact. Field staff will review the Site specific health and safety plan, including the SDS for CaO and the JSA for soil mixing. These forms will be discussed as a part of a daily tailgate safety meeting.

4.1.5.2 Offsite Residents

Applicable health and safety measures will be in place to monitor nearby residences. Dust and VOC emissions will be monitored closely to ensure residents are not exposed. Water spray will be used to mitigate the dust generated from the construction activity. Monitoring stations will be in place to provide real-time air quality data.

4.2 Ambient Air Monitoring

4.2.1 Baseline Ambient Air Monitoring Program

Prior to the CaO pilot study, ARCADIS will implement a baseline ambient air monitoring program along the property boundary of the site. The air monitoring program will be implemented to measure the concentrations of particulate matter (TSP and PM_{10}), lead and a project list of 14 VOCs upwind and downwind to establish baseline conditions at the Site. This program includes at least three sampling events over a one week data collection period for total suspended particulate (TSP) and particulate matter less than 10 microns (PM_{10}), followed by laboratory analysis for particulate mass, lead and VOCs.

The samplers will be located to meet the objectives of the air monitoring program and consistent with the prevailing wind pattern for the area. Figure 6 presents a 5-year composite wind rose for Kokomo Municipal Airport. Considering the size of the site, its proximity to the adjacent neighborhoods, and area wind patterns, air samples will be collected at three locations to provide adequate upwind/downwind coverage near the site perimeter. Two sets of samplers will be placed downwind along the eastern property line between Spraker and Lordeman Streets. One set of samplers will be placed upwind of the proposed treatment area along the western property line.42

TSP samples will be collected on 8x10-inch glass filters. PM_{10} samples will be collected on 8x10-inch quartz micro-fiber filters using rapid air monitoring (RAM) samplers. Gravimetric analysis will be performed on both

types of filters to quantify the particulate mass on the filter. This particulate mass data is used with knowledge of the sample air volume to determine TSP and PM_{10} ambient air concentration. In the laboratory, a small portion of the filter is removed and analyzed by Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) to determine the mass of trace lead on the filter sample. Separately, project VOC samples will be collected in 6 Liter (6L) Summa Canisters equipped with 24 hour regulators. Samplers will be retrieved after 24 hours and submitted to the laboratory for VOC analysis by EPA Method TO-15.

A minimum of one duplicate air sample for every 10 regular samples will be collected for laboratory analysis during the baseline sampling program. The results of the baseline ambient air monitoring program will be compared to ambient air quality standards and health based screening levels. The results will also be used to develop criteria for action based on exposure limits.

This program includes on-site measurement of meteorological data necessary for the interpretation of the air sampling results plus quality assurance/quality control (QA/QC) analyses to ensure the accuracy, precision and scientific defensibility of the data. Meteorological data will be continuously recorded from the beginning to the end of the sampling program using an on-site Met One Instruments Automet Model 466A meteorological monitoring station (MET), or equivalent, located in a central area of the Site. The MET will be located in an area clear of buildings, trees or other obstructions at a height of approximately 10 feet above ground in accordance with U.S. EPA citing and exposure criteria[1].The following parameters will be recorded by the MET: wind speed, wind direction, air temperature, relative humidity, barometric pressure and precipitation. Meteorological data will be downloaded on a daily basis from the MET station. Data will be reviewed for consistency and completeness.

4.2.2 Pilot CaO Treatment Ambient Air Monitoring Program

During the pilot CaO treatment, ARCADIS will implement an ambient air monitoring program to determine the concentrations of TSP and PM_{10}, lead and a project list of 14 VOCs potentially emitted due to remediation activities. The concentrations detected by the ambient air monitoring program will be compared to ambient air quality standards, health based screening levels and the criteria for action developed from the baseline ambient air monitoring program.

ARCADIS has identified two potential exposure scenarios for Site-impacted ambient air: on-Site worker and off-Site residential. Both scenarios will be monitored continuously during the approximate 2-week pilot CaO treatment period.

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[1] U.S. EPA (2008), "Quality Assurance Handbook for Air Pollution Measurements" Volume IV: Meteorological Measurements, Version 2.0, EPA-454/B-08-002.

On-Site worker exposure will be monitored with two technologies. Real-time on-Site ambient air quality will be monitored hourly with a 9.8 eV photo-ionization detector (PID) or greater (the ionization potential of TCE is 9.45eV). PID results will be compared to the standard ARCADIS Health & Safety Plan action levels presented in the table below. In addition to real-time monitoring using the PID, on-Site workers will wear organic vapor passive sampler badges which will be analyzed for VOCs. Badges manufactured by SKC meet OSHA/ASTM/ANSI requirements. Each on-Site worker will be issued a new badge each day. On-Site workers will be required to record start and stop times along with the corresponding barcode ID on a project log sheet. Badges will be shipped to the laboratory at the end of each work day or at a frequency established by the Site Safety Officer (SSO).

Table 1. On-Site Worker PID Exposure Monitoring - Action Criteria

Exposure Hazard	Monitoring Equipment	Monitoring Frequency	Action Level	Required Action
Total VOCs, as TCE (response factor = 0.54)	Photo ionization detector (PID) (9.8 eV lamp or greater)	Continuous in breathing zone	≤ 10 ppm	Normal operations
			> 10 ppm	Sustained >5 min. continuous monitor, review eng. controls and PPE, proceed with caution
			> 10 ppm, ≤ 100 ppm	Normal operations
			> 100 ppm	Upgrade to level C PPE
			≥ 200 ppm	Stop work and apply VOC reducing foam

Off-site residential exposure will be monitored via the same method described in *Section 4.2.1: Baseline Ambient Air Monitoring Program*. As previously detailed, two sets of samplers will be placed downwind along the eastern property line between Spraker and Lordeman Streets and one set of samplers will be placed upwind of the proposed treatment area along the western property line. The locations of the residential ambient air samplers may change based on the results of the baseline ambient air monitoring program and/or meteorological data on prevailing wind direction. These samplers are designed to provide laboratory data that could be used to estimate potential risks to off-Site residents, if concentrations of VOCs are measured in downwind perimeter air monitoring stations.

4.2.3 Work Management Decision Criteria

A portable GC (Frog manufactured by Defiant or comparable) will be used for real-time fence line air quality monitoring to determine if and when work activities must cease in the work zone to ensure that public health is protected in the residential areas off-Site. TCE will be relied upon as a sentinel constituent of concern. If concentrations of TCE exceed 1 ug/m^3 at the fence line closest to off-Site residents to the east of the Site, a stop work action will be issued. Readings will continue to be collected hourly to record when conditions no longer exceed the stop work criterion. The stop work criterion (1 ug/m^3 TCE) is calculated as half of the acceptable air concentration at an off-site residential location requested by the USEPA, which is 2.1 ug/m^3 as the USEPA Regional Screening Level (RSL).

Field samplers will be sent to the laboratory for analysis of TSP and PM_{10}, lead and the project list of 14 VOCs, daily during the first week of treatment and may be less frequent once project conditions are predictable. The most effective sampler will be selected based on detection limits, practicality of use in the field, and total project cost. Candidate samplers include Radiello samplers, SUMMA canisters, and absorbent tubes.

Particulate monitoring results will be compared to federal standards for PM_{10} and lead (Table 2 below). Residential ambient air results for VOC analysis will be compared to USEPA RSLs for indoor air (Table 3 below). The use of RSLs as fence line criteria is very conservative because the off-Site residential air criteria do not include any adjustments for potential dispersion effects related to weather (wind speed or direction). Dispersion modeling can be done for the Site as Site-specific information is obtained on the dispersion observed at the Site during the pilot study. Should the ambient air concentrations at the fence line not exceed the conservative criteria assuming no dispersion, further modeling may not be necessary.

Table 2. Off-Site Residential Ambient Air Screening Levels for Dust

Compound	Type	Averaging Period	Value (µg/m^3)	Basis
TSP	No Federal Standard	24-hour [a/]	N/A	N/A
PM_{10}	Federal Standard	24-hour [a/]	150	NAAQS
Lead	Federal Standard	3-month rolling	0.15	NAAQS; RBC-noncancer

a/ Not to be exceeded more than once per year on average over 3 years
NAAQS: National Ambient Air Quality Standards

Table 3. Off-Site Residential Ambient Air Monitoring Screening Levels for VOCs

CASRN	Constituent	Resident Air RSL (ug/m^3)	
79-01-6	Trichloroethene	2.1	n
127-18-4	Tetrachloroethene	42	n
156-59-2	cis-1,2-dichloroethene	NA	
156-60-5	trans-1,2-dichloroethene	NA	
75-01-4	Vinyl chloride	1.7	c
75-00-3	Chloroethane	10,000	n
75-34-3	1,1-dichloroethane	18	c
75-35-4	1,1-dichloroethene	210	n
107-06-2	1,2-dichloroethane	1.1	c
71-43-2	Benzene	3.6	c
108-88-3	Toluene	5,200	n
100-41-4	Ethylbenzene	11*	c
1330-20-7	Xylenes	100	n
91-20-3	Naphthalene	0.83*	c

U.S. EPA Regional Screening Levels (RSLs) for Residential and Industrial Air, May 2014.
CASRN: Chemical Abstract Service Registry Number
n: non-carcinogenic endpoint; based on a hazard quotient of 1
c: carcinogenic endpoint; based on target cancer risk of $1x10^{-5}$
NA: Not Available due to lack of toxicity information
*RSL based on CalEPA assumptions about carcinogenicity that are not published in USEPA Integrated Risk Information System (IRIS).

In the event one or more of the action criteria is exceeded during the pilot CaO treatment, ARCADIS will take immediate action to remedy the exceedance. In order to immediately stop VOC emissions ARCADIS will deploy plastic sheeting over the exposed soils. Additional treatment of stockpiled soil may be necessary if off gassing is controlled.

5. Schedule

Field activities will commence within 60 days of USEPA approval of the Work Plan. The soil collection for the treatability study is underway and the treatability study is anticipated to be completed in August. Within 60

days of the successful completion of the treatability study and USEPA approval of this work plan, ARCADIS will implement the pilot CaO treatment. The pilot treatment is expected to take two weeks to complete. A report summarizing the treatability study and pilot CaO treatment performance monitoring results will be submitted upon completion of the field activities. Based on the results of the pilot test, recommendations for full scale treatment to meet the remedial objectives will be submitted under separate cover.

6. References

Scott, Robert A., July 2008. Unconsolidated Aquifer Systems of Howard County, Indiana. Division of Water, Resource Assessment Section.

USEPA. 2014b. Regional Screening Level (RSL) Table. May. http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/

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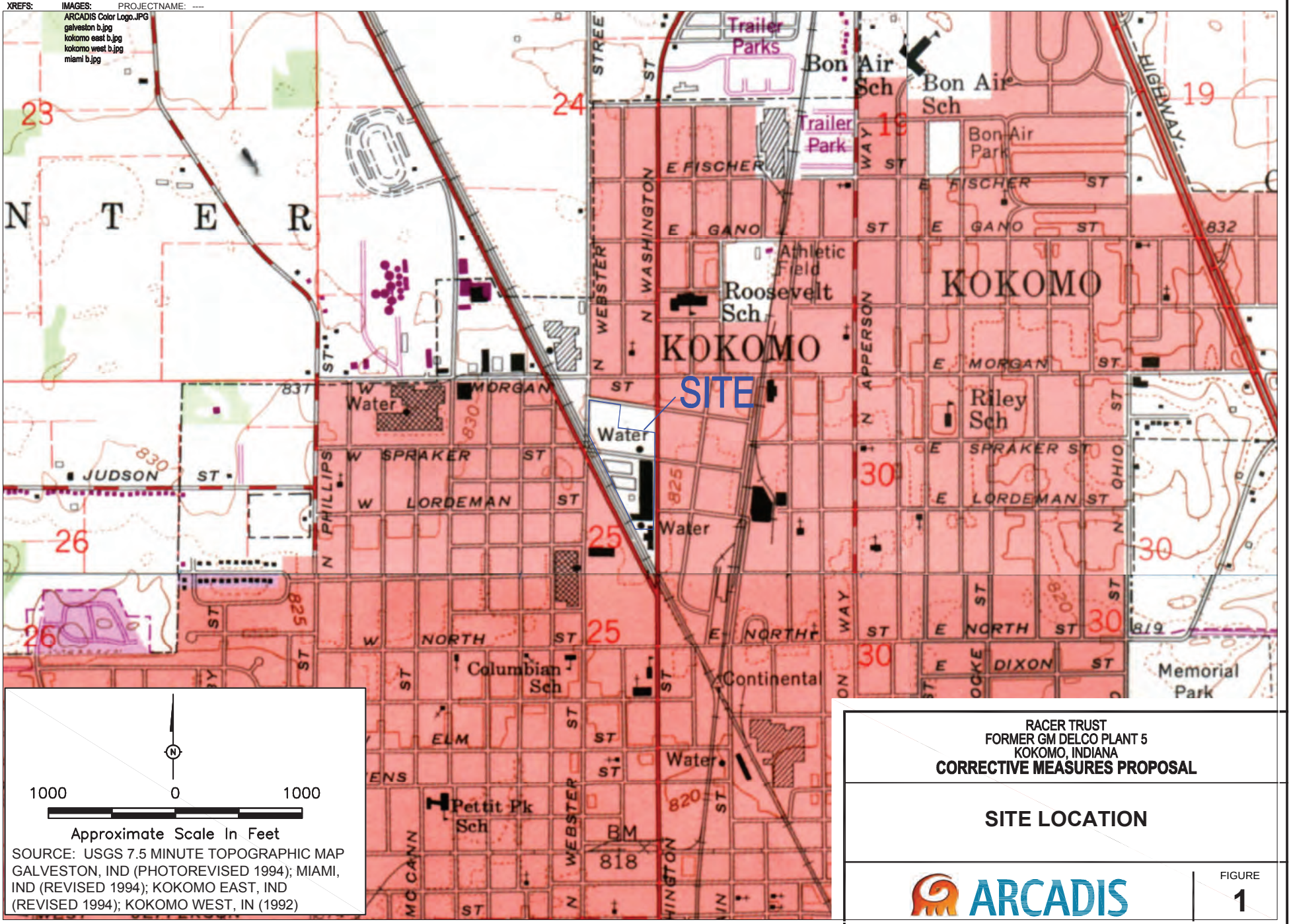
kokomo east b.jpg
kokomo west b.jpg
miami b.jpg



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC MAP GALVESTON, IND (PHOTOREVISED 1994); MIAMI, IND (REVISED 1994); KOKOMO EAST, IND (REVISED 1994); KOKOMO WEST, IN (1992)

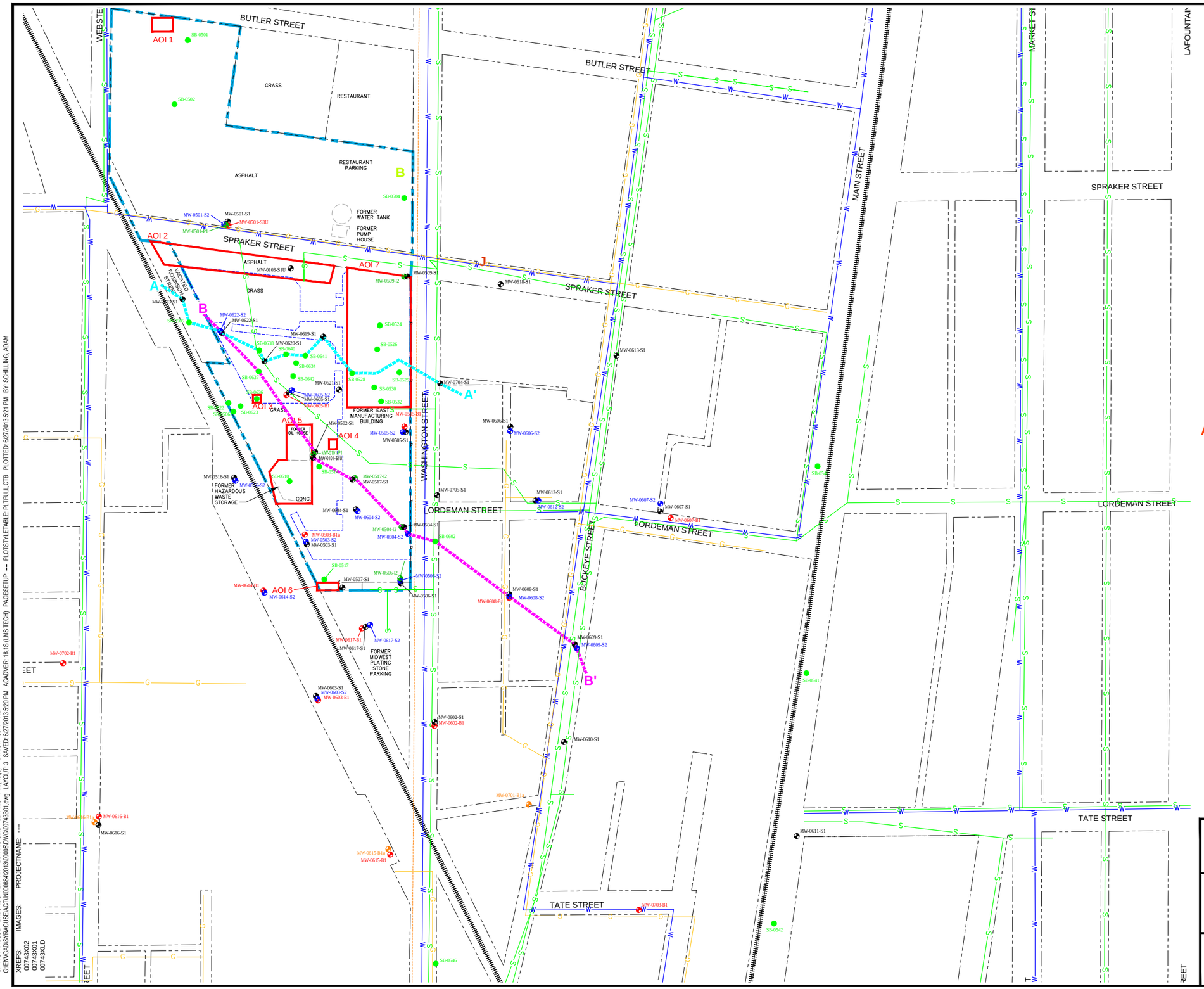
RACER TRUST
FORMER GM DELCO PLANT 5
KOKOMO, INDIANA

CORRECTIVE MEASURES PROPOSAL

SITE LOCATION

ARCADIS

FIGURE
1



LEGEND

- MW-0501-P1 — MONITORING WELL SCREENED IN DISCONTINUOUS UNIT P1 DENOTES SCREENED INTERVAL IS IN A PERCHED ZONE ABOVE UNIT S1 I2 DENOTES SCREENED INTERVAL IS A SAND UNIT BETWEEN UNITS S1 AND S2
- MW-0603-S1 — MONITORING WELL S2 SCREENED IN UNIT S1
- MW-0603-S2 — MONITORING WELL SCREENED IN UNIT S2
- MW-0603-B1 — MONITORING WELL SCREENED IN UNIT B1. UNIT B1 REFERS TO THE UPPER-MOST TRANSMISSIVE ZONE WITHIN THE LIMESTONE BEDROCK UNIT.
- MW-0615-B1a — MONITORING WELL (B1A LOCATIONS ARE OPEN BEDROCK BOREHOLES TO A DEPTH OF APPROXIMATELY 150 FT BG CURRENTLY SEALED WITH FLUTE LINERS)
- PRE-RFI SOIL BORING LOCATIONS
- RFI SOIL BORING LOCATIONS
- S — SEWER UTILITY
- W — WATER UTILITY
- G — GAS UTILITY
- FIBER OPTIC UTILITY
- A — A' CROSS SECTION LOCATION (SECTION LINES AND TEXT COLORED AND DASHED FOR CLAIRITY)

NOTE:

UTILITY LOCATIONS ARE APPROXIMATE BASED ON REVIEW OF AVAILABLE PRINTS FROM EACH UTILITY.

0 100' 200'
GRAPHIC SCALE

RACER TRUST
FORMER GM DELCO PLANT 5
KOKOMO, INDIANA

ISCO TREATMENT AND TRACER TEST WORK PLAN

CROSS SECTION REFERENCE

ARCADIS

DRAWING 2

CITY: SYRACUSE DIV/GROUP: Env-141 DB: AMS GMS LD: AMS PM:(Reqd) LYR:ON=*;OFF=*REF
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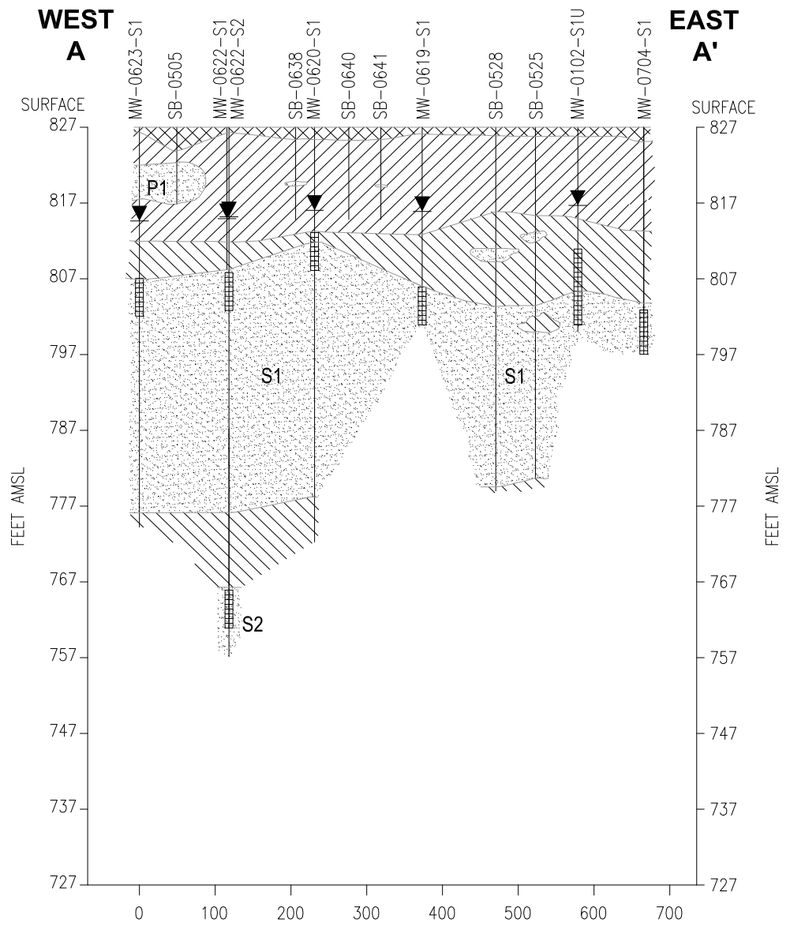
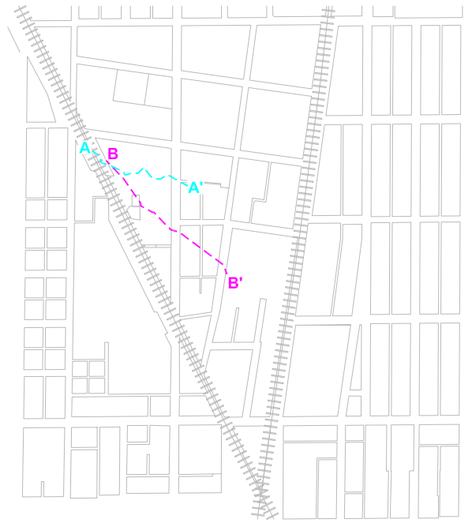


LEGEND:

- FILL/TOPSOIL/GRAVEL/ASPHALT
- PLASTIC CLAY
- SAND
- TILL
- WEATHERED BEDROCK (LIME MUD W/ LIMESTONE FRAGMENTS)
- BEDROCK (LIMESTONE)
- MONITORING WELL SCREENED INTERVAL
- S1/S2/B1 — SATURATED UNIT ID
- P1 — INDICATES DISCONTINUOUS SATURATED SAND UNIT ABOVE UNIT S1
- I2 — INDICATES DISCONTINUOUS SATURATED SAND UNIT BETWEEN UNITS S1 AND S2
- DEPTH TO WATER DATA (10/2007)



CROSS-SECTION LOCATIONS

NOT TO SCALE

0 10' 20'
VERTICAL SCALE

0 100' 200'
HORIZONTAL SCALE

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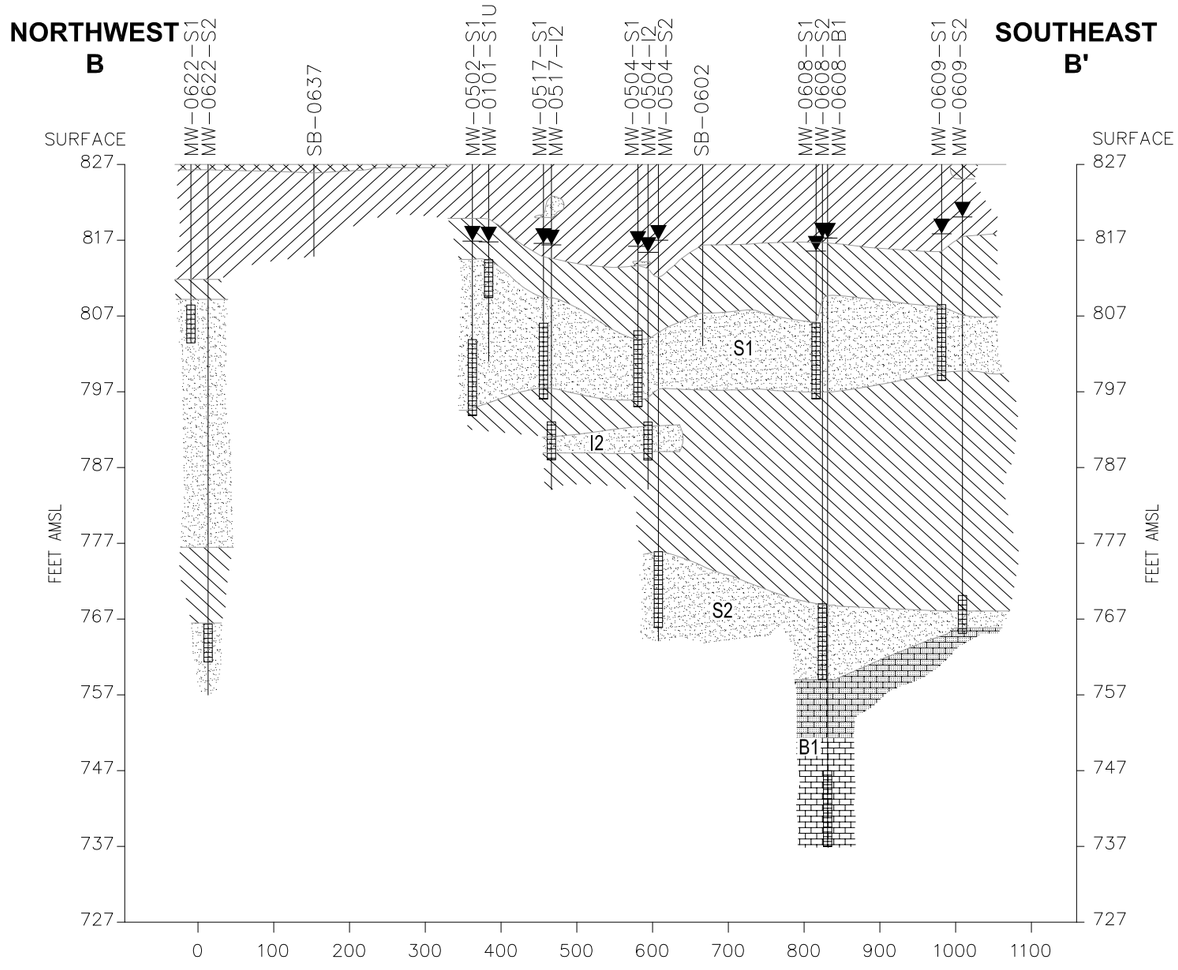
FORMER GM DELCO PLANT 5
KOKOMO, INDIANA

ISCO TREATMENT AND TRACER TEST WORK PLAN

CROSS SECTION A - A'

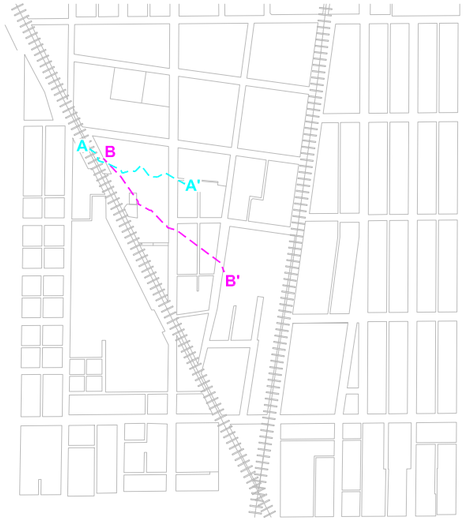
ARCADIS

DRAWING
3



LEGEND:

- FILL/TOPSOIL/GRAVEL/ASPHALT
- PLASTIC CLAY
- SAND
- TILL
- WEATHERED BEDROCK (LIME MUD W/ LIMESTONE FRAGMENTS)
- BEDROCK (LIMESTONE)
- MONITORING WELL SCREENED INTERVAL
- S1/S2/B1 — SATURATED UNIT ID
- P1 — INDICATES DISCONTINUOUS SATURATED SAND UNIT ABOVE UNIT S1
- I2 — INDICATES DISCONTINUOUS SATURATED SAND UNIT BETWEEN UNITS S1 AND S2
- DEPTH TO WATER DATA (10/2007)



CROSS-SECTION LOCATIONS

NOT TO SCALE

0 10' 20'
VERTICAL SCALE

0 100' 200'
HORIZONTAL SCALE

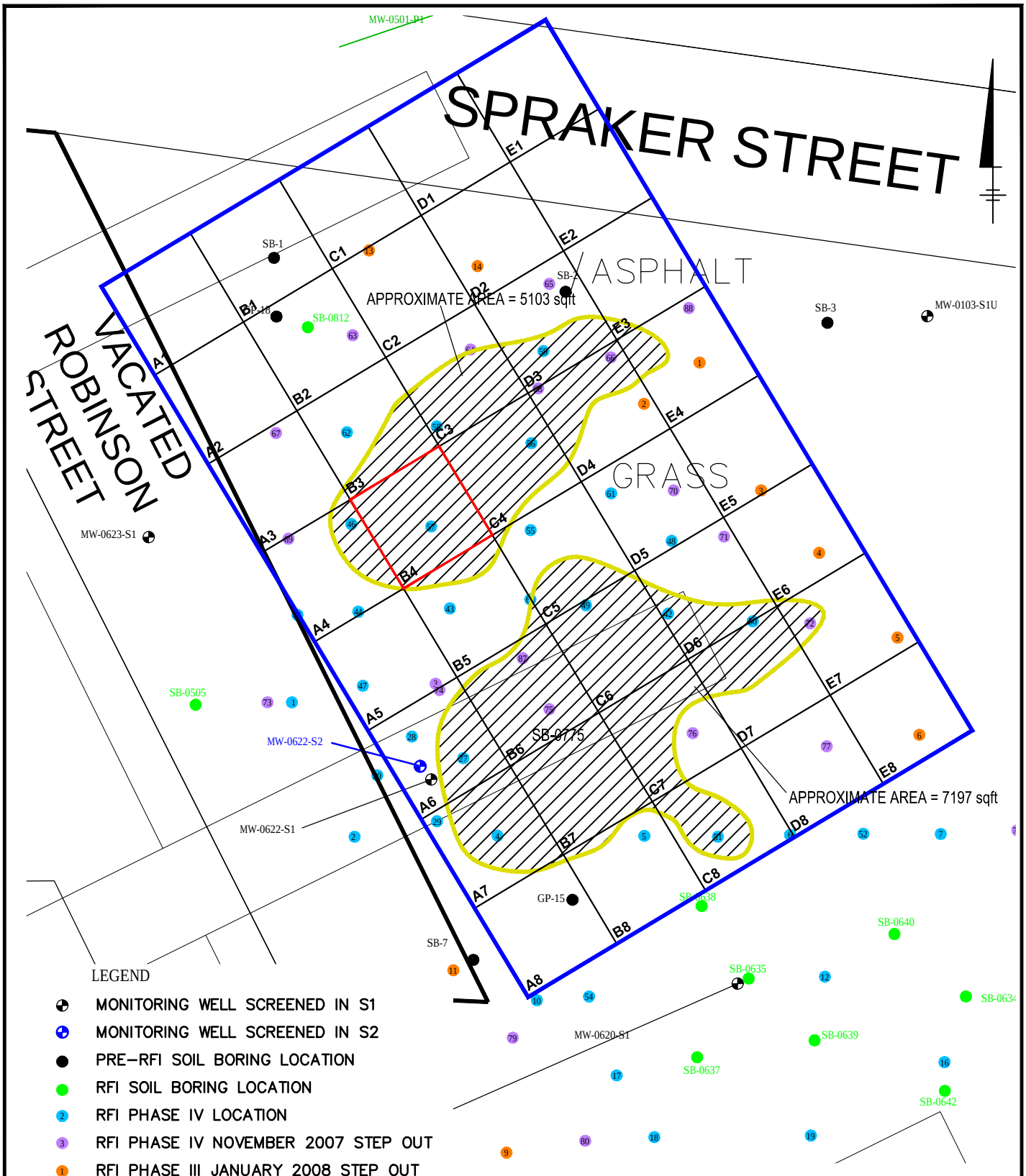
RACER TRUST
FORMER GM DELCO PLANT 5
KOKOMO, INDIANA

ISCO TREATMENT AND TRACER TEST WORK PLAN

CROSS SECTION B - B'

ARCADIS

DRAWING
4



LEGEND

- MONITORING WELL SCREENED IN S1
- MONITORING WELL SCREENED IN S2
- PRE-RFI SOIL BORING LOCATION
- RFI SOIL BORING LOCATION
- RFI PHASE IV LOCATION
- RFI PHASE IV NOVEMBER 2007 STEP OUT
- RFI PHASE III JANUARY 2008 STEP OUT
- SOIL CORRECTIVE MEASURES BOUNDARY
- TREATMENT CELL GRID LINE
- A2 TREATMENT CELL ID
- 400 mg/kg TCE CONTOUR
- CaO TREATMENT AREA
- PILOT STUDY TREATMENT CELL

0 40' 80'

GRAPHIC SCALE

RACER TRUST
FORMER GM DELCO PLANT 5
KOKOMO, INDIANA
CORRECTIVE MEASURES PROPOSAL

BOUNDARY OF AREA IDENTIFIED FOR SOIL CORRECTIVE MEASURES

ARCADIS

FIGURE 5

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVN\00884\2013\00004\DWG\00743B02.dwg LAYOUT:5 SAVED: 9/30/2013 1:33 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: -- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 9/30/2013 2:00 PM BY: SCHILLING, ADAM
XREFS: 00743X01 00884XLD IMAGES: PROJECTNAME: ---

WIND ROSE PLOT:

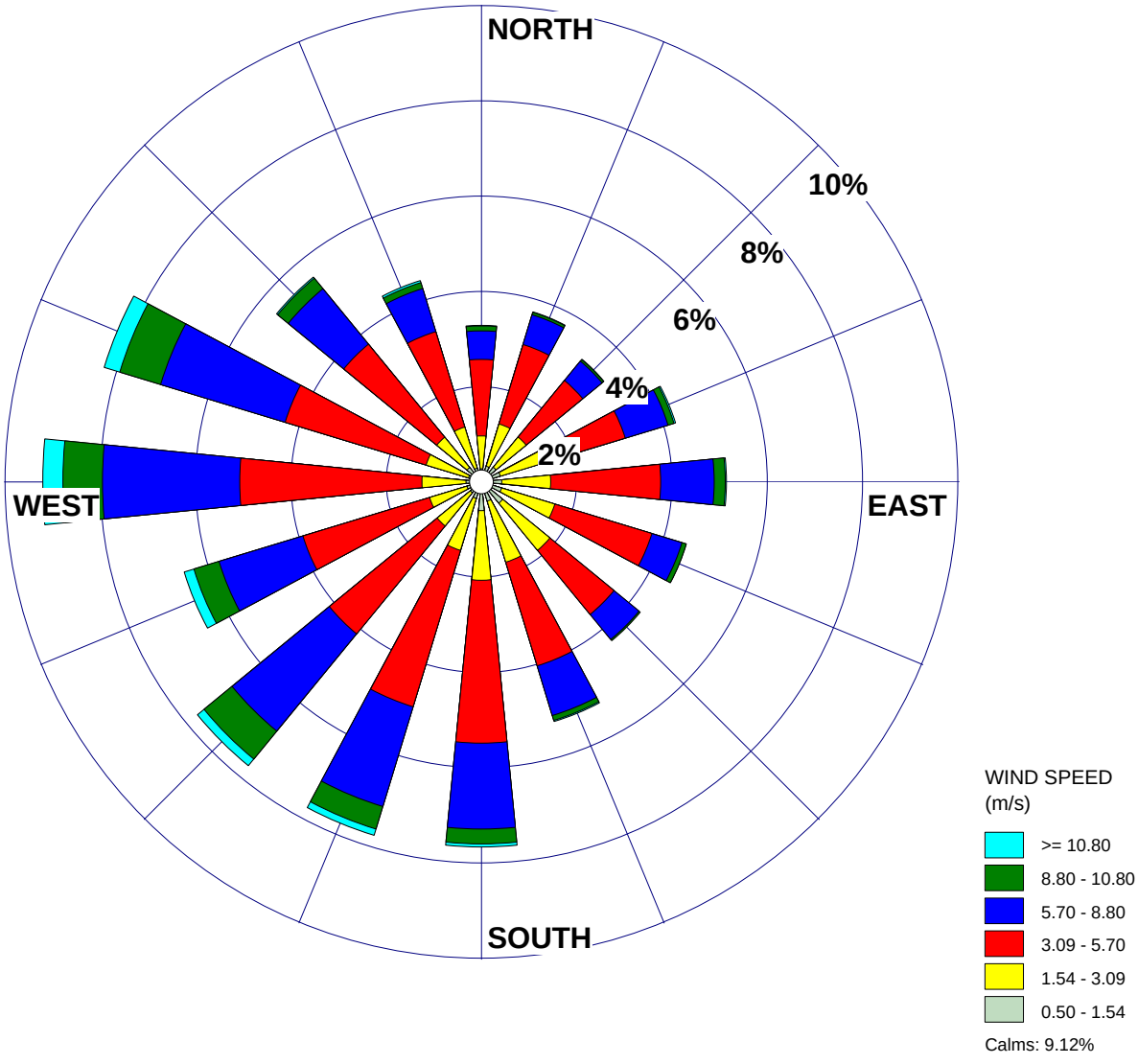
Kokomo Municipal Airport (AWS 724287)

Composite 5-Year Windrose: 2009-2013

DISPLAY:

Wind Speed

Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 1/1/2009 - 00:00** **End Date: 12/31/2013 - 23:00**	COMPANY NAME:	
		MODELER: **RLK**	ARCADIS
	CALM WINDS: **9.12%**	TOTAL COUNT: **39070 hrs.**	
	AVG. WIND SPEED: **4.25 m/s**	DATE: **3/27/2014**	PROJECT NO.: