REVISED INVESTIGATIVE WORK PLAN
OPERABLE UNIT #2
Buffalo Business Park

Voluntary Cleanup Site No. V00663-9
Voluntary Agreement Index No. B9-0637-03-06

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1.0 INTRODUCTION

1.1 General

Buffalo Business Park (BBP) is currently implementing a Voluntary Cleanup at their facility located at 1800 Broadway Avenue in the City of Buffalo, New York (Voluntary Site Cleanup # V00663-9). To accomplish this objective, BBP has entered into a Voluntary Cleanup Agreement with the New York State Department of Environmental Conservation (NYSDEC) for the investigation and/or remediation of two operable units. Operable Unit #1 (OU #1) in the southwest central area of the Site consists of an area where soil contamination has been delineated. OU#1 underwent remedial activities in mid April, 2006 in the form of excavation and removal of contaminated soils.

Operable Unit #2 (OU #2) is located along the southwest property boundary, and consists of an area where previous investigations have encountered contaminated groundwater. Golder Associates Inc. (Golder) has developed this Investigation Work Plan (IWP) for OU #2 to recommend supplemental subsurface investigation activities and establish the criteria for performance of these activities on the southwestern portion of BBP property (Figure #1).

1.2 Investigation Objectives

The objectives of the supplemental subsurface investigation activities at OU#2 have been revised per NYSDEC request as follows:

- Further define groundwater flow direction at the Site in the area of OU#1 and the site building;
- Further define groundwater quality in the bedrock zone; and
- Ascertain if vapor intrusion within the building located along the southern property boundary is a potential concern.

The following text provides a discussion of Golder's understanding of the site background work already completed, the scope of work, and the technical approach and procedures that will be used to further evaluate potential impacts to groundwater at the property.

1.3 Project Background

According to historic Sanborn maps, the site has been utilized as the Buffalo Industrial Park since 1961. Prior to 1961, the site was used for railroad transport/tracks associated with the Pullman Car Company from 1900 until at least 1950.

In December 1999, Lender Consulting Services (LCS) conducted a Phase I Environmental Site Assessment (ESA), and subsequently completed a Phase II soil and groundwater study (March, 2003). During 2001 and 2002, several soil and groundwater investigations were completed, consisting of 27 test borings and 27 groundwater monitoring points (3 permanent and 24 temporary). Soil and groundwater samples were collected and analyzed for volatile organic compounds (VOCs) and select samples were also analyzed for RCRA metals and semi – volatile organic compounds (SVOCs). According to LCS, the investigations identified the presence of VOCs. Soils were found to contain tetrachloroethene and groundwater was found to contain

tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, methylene chloride and vinyl chloride.

Buffalo Industrial Park, Inc., acting as an Innocent Owner, agreed to participate in the New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Program (VCP) and entered into a Voluntary Cleanup Agreement (VCA) for remedial investigation/remedial action under Voluntary Cleanup Site No. V00663-9 and Index No. B9-0637-03-06. This VCA was initiated upon Buffalo Industrial Park's submittal of a VCA application dated May 23, 2003.

In October 2003, LCS submitted a work plan for soil remedial activities to the NYSDEC for review and comment: Remedial Action Work Plan, Operable Unit # 1, Buffalo Business Park Site; 1800 Broadway, Buffalo, New York.

In addition, on April 2005, LCS submitted the following document for additional groundwater investigation: Investigation Work Plan, Operable Unit #2; Buffalo Business Park Site, 1800 Broadway, Buffalo, New York.

Subsequent to the submission these documents, BBP contracted LTP Services, Inc. (LTP) to review the documents, and evaluate alternatives to the proposed soil remedy, which was ex-situ soil vapor extraction. LTP, in conjunction with NYSDEC approval, proposed that the soil removal activity focus on removal with off-site disposal of soils within a certified, engineered solid waste landfill. In April 11th, 2006, contaminated soils were removed from Operable Unit #1 (OU#1) at BBP to a depth of 14 feet. Overburden soils that were not contaminated were stockpiled for re-use as backfill. Confirmation soil samples were collected from the side walls of the excavation to confirm a clean closure. In addition, the overburden materials for six to ten feet were also sampled to evaluate the quality of the overburden materials for backfill purposes. Once "clean" conditions were established on April 17th, 2006 (below NYSDEC TAGM actions levels) using the analytical results for side wall samples from the excavation, the excavation was backfilled with overburden materials stockpiled on site (also tested as "clean"), and overlain by crushed concrete approved in advance by the NYSDEC.

1.4 Site Geologic and Hydrogeologic Setting

1.4.1 Geology

Several environmental studies have previously been conducted at BBP from which subsurface conditions have been generally characterized. The overburden materials are approximately 14 feet in thickness at BBP. They generally consist of fill materials that are variable in thickness to a depth of approximately two feet. Fill material is generally described as sands and gravel with some ash, brick, wood and railroad ties which is consistent with its past use as a rail yard. This is underlain by native materials consisting of brown gravelly sands with some silt. This material is laterally variable, but is generally 14 to 16 feet in thickness.

Bedrock is at approximately 14 feet below ground surface (BGS), and consists of gray, crystalline limestone, thought to be the Onondaga Limestone.

1.4.2 Hydrogeology

Groundwater is present in the overburden with groundwater flow direction reportedly to the south. Groundwater in bedrock reportedly flows to the southeast; however, the overburden and bedrock hydraulic zones are likely connected given the highly permeable nature of the overburden gravelly sands.

2.0 SCOPE OF WORK

2.1 General

The following provides an overview of the scope of work that will generally consist of the following work elements:

- Installation of four groundwater monitoring wells (wells) into bedrock;
- Survey all well locations and tie control into four existing site bedrock wells;
- Develop and sample the four newly installed bedrock wells;
- Collect groundwater elevation information from the four newly installed bedrock wells and four existing bedrock wells;
- Analyze groundwater samples from the four newly installed bedrock wells for volatile organic compounds (VOCs) through the use of a subcontract laboratory;
- Investigate the potential soil vapor intrusion pathway into the structure located nearest to existing well MW – 4; and
- Prepare a Site Investigation/Remedial Alternatives Report (SI/RAR) which summarizes the work performed, incorporates a Qualitative Human Health Exposure Assessment, and recommends an appropriate remedial alternative for groundwater (OU#2).

2.2 Bedrock Groundwater Investigation

2.2.1 General Conditions

Groundwater analytical data collected as part of this investigation will be used to further characterize groundwater conditions in bedrock. Currently, four bedrock groundwater wells (VCA-MW-1-BR, VCA-MW-2-BR, VCA-MW-3-BR, and VCA-MW-4-BR) are located within or immediately adjacent to OU #2 and will be used as part of this investigation. To further characterize hydrogeologic conditions in bedrock, four new bedrock wells (VCA-MW-5-BR, VCA-MW-6-BR, VCA-MW-7-BR and VCA-MW-8-BR) will be installed on BBP property, and property immediately west of the BBP property.

Field work will be completed using Golder's standard health and safety plan (HASP) that will be adopted for site-specific conditions, using Level D personal protective equipment. Ambient air, and soil samples derived from split barrel sampling during the drilling of overburden, will be screened in the field with a photo ionization detector (PID) for VOCs with action levels that are found in Golder's health and safety plan that is attached as Appendix A. Golder will not be responsible for general site health and safety, just the safety of its employees.

No soil or bedrock core samples will be submitted to the contract laboratory for analysis as part of this investigation. Only groundwater samples will be submitted for laboratory analysis.

2.2.2 Task 1. Installation of Groundwater Monitoring Wells

The installation of four bedrock groundwater monitoring wells is recommended to further characterize groundwater flow direction and groundwater quality at OU#2. This additional geologic and hydrogeologic information in conjunction with information collected from the four existing site bedrock wells will then be used to provide a better understanding of bedrock

groundwater conditions, and to provide the most likely soil vapor sampling point(s) within the site building for purposes of completion of the soil vapor investigation.

Drilling locations for the four new bedrock wells are depicted on Figure 1. New well locations are designed to provide a better understanding of groundwater flow direction in OU #2 and under the building, as well as the nature groundwater quality immediately upgradient of OU #1. In addition, the new bedrock wells should provide a better understanding of groundwater quality near the building along the southern property boundary.

VCA-MW-5-BR will be located on the western adjacent property (Family Dollar Store and Tops) approximately 45 feet north of the sidewalk along Broadway Avenue, and approximately 25 feet west of the property BBP western property line.

VCA-MW-6-BR will be located approximately 210 feet east of the northwest corner of the brick building that is located along the southern BBP property boundary. This well will be located approximately 20 feet south into the building in an area with a vaulted ceiling.

VCA-MW-7-BR will be located approximately 170 north of the sidewalk along Broadway Avenue, and approximately 60 feet west of the BBP property boundary.

VCA-MW-8-BR will be located 10 feet south of the southeast corner of the Family Dollar Store approximately 25 feet west of the BBP property boundary.

Task 1a. Site Mark out.

Prior to the start of drilling activities, the location of the two new wells will be marked out on the pavement. Once the locations are marked, the drilling subcontractor will notify Dig Safely New York for the mark out of underground utilities. The site maintenance engineer will also be contacted to review proposed drilling locations. Golder will not be responsible for locating underground utilities.

Task 1b. Decontamination of Drilling Equipment.

To minimize the potential for contamination/cross contamination of the wells from outside sources and/or the transport of potentially contaminated materials from the Site, the drilling equipment will be decontaminated prior to the start of drilling activities, between well installations, and at the completion of drilling activities. To accomplish this objective, a temporary decontamination pad (Decon pad) will be constructed at the Site. The decon pad will be constructed in a manner such that liquid and solid wastes can be contained, and subsequently disposed of. The Decon pad will be constructed of high density polyethylene (HDPE) plastic or similar material as a barrier with raised berms on each side to contain liquids and of sufficient size as to allow for the decontamination drilling equipment such as hollow stem augers and drill rods. Drilling equipment will be decontaminated on the Decon pad using a steam cleaner.

Task 1c. Investigative Derived Waste.

Solid and liquid waste from drilling, equipment decontamination and well development will be generated as part of this investigation. These materials will be placed in drums, and left for disposal by Buffalo Business Park. It will not become the property of Golder, nor its drilling subcontractor.

Task 1d. Borehole Drilling.

The locations of the test borings for the installation of the four new bedrock wells are described on Figure #1. Borings will be advanced to a depth to refusal (approximately 15) feet through fill and overburden materials using 4.25 inch inside diameter hollow stem augers (HSAs). At each of the proposed well locations, the overburden will be sampled at five-foot intervals (Standard Sampling) with 2-inch diameter by 24 inch long steel split-barrel sampler in general accordance with ASTM D 1586 (Standard Penetration Test).

A Golder Associates Inc. (Golder) geologist will be on-site to observe the drilling operation and record pertinent information in an engineer's bound field notebook such as soil sample information, boring number, sample number, depth, blow counts, lithologic description, color, moisture, and soil headspace organic vapor measurements. Soil samples will be collected from the split-barrel samplers and placed in glass jars. Head space readings will be collected from each soil sample using a PID, and the samples will be described and classified in the field by visual examination in general accordance with the Unified Soils Classification System (USCS). Last, a log will be prepared for each boring.

Upon encountering the top of bedrock and refusal, the HSAs will be extracted from the borehole, and a 4-inch inside diameter steel casing (temporary casing) will be placed in the borehole and seated in the top of bedrock. If necessary, a 3 7/8-inch tri-cone roller bit will be used to clean out the temporary casing prior to start of rock coring.

Task 1e. Rock Coring.

Clean, potable water will be used for rock coring purposes. An HQ coring tool (3.7-inch outside diameter) will be used to obtain a 2.5-inch core from the upper 15 feet of bedrock. Coring of the bedrock will be completed in general accordance with ASTM 2113 (Diamond Core Drilling for Site Investigation). The coring interval may be modified depending of field conditions.

During all coring activities, the coreholes will be flushed with clean potable water that will be recirculated. Water generated during coring activities will be drummed as investigative derived waste and treated per Task 1c.

Continuous core will be collected, labeled, and stored for each well. A Golder on-site geologist will maintain a record of the coring operations including penetration rates, core recoveries, Rock Quality Designations (RQDs), and VOC measurements of the core samples and drilling fluids with a PID. Upon completion of the coring and/or boring activities, a detailed Subsurface Boring Log will be prepared for each boring which will describe the observed lithologic information, well construction details, and pertinent drilling observations.

Task 1f. Bedrock Monitoring Well Installation.

Bedrock monitoring wells will be constructed using "certified clean" well materials. The newly drilled bedrock wells will be completed by placing a ten-foot length of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) screen with 0.010-inch machine-cut slots from the bottom of the borehole to approximately five feet below the top of bedrock. A 2-inch diameter Schedule 40 PVC riser will complete the well from the top of the screen to the ground surface. Six inches of an appropriately-sized sand pack will be placed in the bottom of the corehole, and around the

screen from the bottom of the borehole to approximately two feet above the screen. Bentonite pellets will be placed from the top of the sand upward for a minimum of 2 feet.

Cement/bentonite grout will be placed from the top of the bentonite to the ground surface. The bedrock monitoring wells will be completed at grade with a 9-inch diameter flush mount curb box.

A well construction diagram will be prepared for each new boring that will describe actual depth of the well along with construction details (Figure 2).

1g. Monitoring Well Development.

Following installation, the four newly installed wells will be developed by pumping, bailing, and/or surging the open interval to remove drill cuttings and water introduced into the formations during installation. Development of the wells will continue until no further reduction in turbidity is observed in the extracted groundwater and the volume of water lost during rock coring/construction is recovered (if possible). Well development data, including the duration of the development process, methods employed, and the volume of water removed, will be included on the Subsurface Boring Logs. Water purged from the wells during the development process will be drummed and stored on site as investigative derived waste and treated as described in Task 1c.

2.2.3 Task 2. Survey

The new and existing monitoring well horizontal coordinates, top-of-casing elevations, and ground surface elevations will be surveyed by a New York State-licensed surveyor. In addition, the coordinates for these wells will be tied into a site reference such as the corner of the building. The horizontal coordinates will be measured from the northernmost point of the well casing to the closest 0.1-foot, and referenced to the site reference point(s). Elevations of ground surface and top-of-casing will be to the closest 0.01 foot. The information obtained will be tabulated and used for completion of well logs, schematics, and maps.

2.2.4 Task 3. Groundwater Sampling

Task 3a. Collection of Groundwater Samples for Laboratory Analysis.

One round of groundwater samples will be collected from the four newly installed bedrock monitoring wells. The existing wells will not be resampled. Table 1 lists the parameters for analysis, and Table 2 lists the required sample containers, sample volumes, preservatives, and holding times for the groundwater samples.

Pre-sampling activities will include determining the well's water elevation, a well-maintenance check, and organic vapor monitoring with a PID. After completion of these pre-sampling activities, the wells will be purged of three well volumes (or until dry).

A sample of the third well volume will be measured for the following field parameters: pH, temperature, and specific conductivity. Groundwater samples will then be collected for chemical analysis using a Teflon® or polyethylene bailer for VOCs analysis. Samples will be packed on ice in coolers and delivered to Severn Trent Laboratories (STL) in Amherst for analysis.

Task 3b. Groundwater Elevation Measurement.

One synoptic round of groundwater elevation measurements will be obtained from the eight bedrock monitoring wells (four existing and four newly installed wells) that are part of this investigation following the installation and development of the new monitoring wells. This measurement round may be timed to coincide with the groundwater sample collection event. The measurements will be obtained using electronic water level meters. These data will be used to construct maps depicting the configuration of the potentiometric surface for the bedrock flow zone at OU#2.

Task 3c. Laboratory Analysis of Groundwater Samples.

STL Laboratories in Amherst, New York will perform all sample analyses for the bedrock investigation. No soil or bedrock core samples will be sent to the contract laboratory for analysis. Four groundwater samples along with the appropriate quality assurance/quality control samples will be analyzed by the contract laboratory as follows:

- VCA-MW-5-BR;
- VCA-MW-6-BR;
- VCA-MW-7-BR;
- VCA-MW-8-BR;
- Duplicate Sample; and
- Matrix spike/ matrix spike duplicate.

Groundwater samples will be analyzed for target compound list VOCs by USEPA Method 8260 with NYSDEC ASP Category B Deliverable reporting. Sample results will be received using standard turnaround times (10 business days).

2.3 Task 4. Investigation of Soil Vapor Intrusion into the Site Building

Prior to the completion of a soil vapor intrusion study, several steps will have been taken to assist with the management and investigation of potential soil vapor issues at the site. The first step toward management and mitigation of potential vapor intrusion is source removal, which was completed by removing of contaminated soils at OU#1.

The next step in the evaluation and investigation of potential vapor intrusion into the Site structure south of OU#1 is the completion of the bedrock groundwater investigation for OU#2. The groundwater information collected from the bedrock investigation will be used to provide additional information on groundwater flow direction, and VOC contaminant concentrations in groundwater under or immediately adjacent to the site structure. This information will be used to select the most likely sampling point(s) for the completion of soil vapor intrusion investigation within the site structure.

The draft New York State Department of Health vapor intrusion guidance is applicable for this project; thus, a soil vapor intrusion investigation is proposed. Based upon the groundwater potentiometric surface map and contaminant concentrations map that is generated as part of Task 2, the following samples will be collected as part of the Sub-Slab Vapor/Indoor investigation:

- A sub-slab soil vapor sample within the site structure in the area of estimated highest groundwater contaminant concentrations;
- An indoor air sample at a height of approximately three feet above the building floor in proximity to the sub-slab sampling location; and
- An outdoor air sample from a representative upwind location, at a height of approximately four to six feet above ground (breathing zone).

The following provides details of the pre-sampling documentation as well as the sampling methods that will used to collect the referenced samples.

Task 4a. Pre-sampling Documentation.

Prior to the start of, and during completion of the Soil Vapor Intrusion Investigation, general site conditions will be documented such as:

- Uses of volatile chemicals in on-site processes and/or building maintenance;
- Use of heating and cooling systems during sampling;
- Sample locations in relationship to floor layout, chemical storage areas, sumps, drains, parts washers, HVAC system air supply and return registers, and underground utilities;
- General site layout including adjacent streets, driveways, building footings and paved areas;
- Weather conditions (i.e., precipitation, indoor and outdoor temperature and barometric pressure);
- Air flow patterns within the building; and
- Surface spills, stains, odors and PID measurements of the ambient air.

Task 4b. Sub-Slab Vapor Sampling.

The sub-slab vapor sampling point will be installed at a location within the building where the potential for ambient air infiltration via floor penetrations is minimal and out of the way of general pedestrian and vehicle traffic. Thus, prior to installation of the sub-slab vapor probe, the building floor will be inspected and any observed penetrations (cracks, floor drains, underground utility perforations, sumps, etc.) will be noted and recorded.

The sub-slab vapor probe installation will be temporary and will be constructed with polyethylene or Teflon. The tubing will be installed through the building slab and will not extend more than two inches into the sub-slab material. A non-VOC emitting sealant will be used to seal around the vapor probe. Sub-slab samples will be collected in the following manner:

1. After installation of the probe, one to three volumes (i.e., the volume of the sample probe and tubing) will be purged to assure the sample collected will be representative of sub-slab conditions.
2. Flow rates for both purging and collecting will not exceed 0.2 liters per minute to minimize outdoor air infiltrations during sampling.
3. The vapor will be collected using a Summa Canister or “MiniCan” certified clean by the laboratory.
4. The sampling interval will be for a period of approximately six to eight hours.

Indoor Air Sample

The indoor air sample will be collected as follows:

1. The sample collection rate will be consistent with that of the sub-slab sampling.
2. Flow rates for both purging and sampling will be the same as for the sub-slab sample (0.2 liters per minute).
3. The indoor air will be collected using a Summa Canister or "Mini" Can certified clean by the laboratory.
4. The sampling interval will be for a period of approximately six to eight hours.

Outdoor Air Sample

The outdoor air sample will be collected as follows:

1. The sample collection rate will be consistent with that of the sub-slab sampling.
2. Flow rates for both purging and sampling will be the same as for the sub-slab sample (0.2 liters per minute).
3. The indoor air will be collected using a Summa Canister or "Mini" Can certified clean by the laboratory.
4. The sampling interval will be for a period of approximately six to eight hours.

Task 4c. Laboratory Analysis of Sub-Slab Vapor and Air Samples.

Vapor and air samples (three samples) will be analyzed by Centek Laboratories in Syracuse, New York for VOCs by USEPA Method TO-15. The sub-slab sample will be analyzed with a detection limit of 0.25 micrograms per cubic meter (ug/m^3), and all results will be reported in (ug/m^3). Results will be evaluated and compared to draft guidance. Based on sub-slab vapor, and indoor/outdoor sampling results, one of the following recommendations will be made:

- No further action;
- Ongoing monitoring; or
- Mitigation

2.4 Task 5. Remedial Action Report

Once the data are evaluated and a data usability summary report (DUSR) is completed, the remedial action report (RAR) will be prepared. The DUSR will be a part of the RAR.

2.4.1 Data Usability Summary Report

The groundwater samples will be analyzed in accordance with the analytical methods listed as described under Task 3c – Laboratory Analysis of Groundwater Samples, and in Table 1. The chemistry data will be transferred by the laboratory and maintained by Golder in tabular data base format. The laboratory will provide an Electronic Data Deliverable, which will be kept with the project file unmodified. Data will be extracted from these files and tabulated in excel spreadsheets for report preparation purposes.

For all analytical samples associated with this project, the laboratory will produce NYSDEC ASP Category B Deliverable packages including a Level IV report. Data usability will be reviewed with regard to the evaluation of holding time, surrogate and spike recoveries, precision of duplicate measurements, calibration and instrument performance, blank contamination, compound identification, and compound quantification. Data will be qualified as necessary and qualifications will be explained in the DUSR.

Non-TCL data will be evaluated, also using USEPA data validation Standard Operating procedures (SOPs) and the appropriate NYSDEC guidance documents, based upon holding times, blank results, and quality control (QC) results assessing accuracy and precision. All analytical data packages will be reviewed for completeness and QC summaries will be evaluated and compared to the appropriate precision and accuracy criteria (PARCC). The PARCC criteria and criteria specified in other applicable guidelines may not always be achievable. Thus, professional judgment, in conjunction with the USEPA data validation SOPs and the appropriate NYSDEC guidance documents, will be used to determine data usability. Any qualification of non-TCL data will also be explained in the DUSR.

Any qualifiers that are applied to the data during the validation process will be manually entered into the database. Qualified results will be tabulated directly from the database. All results and qualifiers will then be checked to confirm accuracy.

2.4.2 Groundwater Quality Evaluation

This subtask involves evaluating the groundwater sample analytical data collected as part of the bedrock groundwater investigation at OU#2. The concentrations of the detected constituents will be compared to the water quality standards in the NYSDEC Technical and Operations Guidance Series (TOGS) 1.1.1: "Ambient Water Quality Standards and Guidance Values" (April 2000) and with Technical and Administrative Guidance Memorandum 3028 (TAGM 3028) Groundwater Action Levels (March 1997).

2.5 Hydrogeologic Evaluation

The bedrock groundwater investigation data will be evaluated including;

- Results of borehole drilling, monitoring well installation, soil and groundwater sampling;
- Examination of soil and core samples obtained from the newly installed monitoring wells to characterize the overburden and bedrock geology; and
- Evaluation of groundwater elevation data for the bedrock flow zone within and adjacent to the investigation area.

2.6 Reporting

Following the completion of the data evaluation, a RAR will be prepared which will summarize the field activities, present the data for the investigation area, and provide an interpretation of the data. The report will include:

- Tabular summaries of groundwater laboratory and field data with comparisons to applicable NYSDEC TOGS standards;
- Subsurface boring logs (including geologic descriptions and well construction details);

- Site maps showing the investigation area, and well locations;
- Groundwater quality maps for the bedrock flow zone;
- Groundwater elevation contour maps for the bedrock flow zones;
- Data usability summary report (DUSR) for the groundwater analytical results; and
- Tabular summary of the results of the Soil Vapor Intrusion Investigation with comparisons to draft guidance.

3.0 PROJECT ORGANIZATION

Mr. Norman K. Wohlabaugh, P.G., C.P.G. will act as the Project Manager for this project, and will be the main point of contact. Mr. Wohlabaugh, a Certified Professional Geologist has approximately 30 years experience with the design and implementation of surface and subsurface investigations, and remedial activities as related to soils, bedrock, surface water and groundwater for environmental and geotechnical projects He has significant experience with completion of Phase I and Phase II investigations, soil vapor investigations, investigation and remediation activities at both Resource Conservation and Recovery Act (RCRA) and CERCLA sites, as well as active commercial and industrial facilities, underground storage tank sites, manufactured gas plant (MGP) sites, NYSDOT Corridor Studies, and geotechnical and environmental investigations for bridges and roads. Project experience has included proposal preparation, permitting, design, cost estimation, project management for various geologic, hydrogeologic, geotechnical, geophysical projects; investigations, project management for underground storage tank and other remedial actions at small to large manufacturing facilities; and post closure care cost financial assurance planning. Mr. Wohlabaugh will be responsible for the overall technical direction of the project and will review all project deliverables.

Mr. David C. Wehn, C.P.G., Golder's Office Manager will act as Technical Director for the completion of this project. Mr. Wehn is a Certified Professional Geologist and a Senior Project Hydrogeologist. Mr. When has over 15 years of consulting experience in the environmental industry, and has extensive field sampling experience. In addition, Mr. Wehn has extensive field investigation experience, experience with the management of various hydrogeologic investigations at several large manufacturing facilities, various downhole and surficial geophysical studies, post-closure O&M for a municipal waste landfill, and groundwater extraction system design and construction quality assurance (CQA), and a large sediment remediation project in Salem, Massachusetts. Mr. Wehn is the current project manager and client contact for several facilities with multiple ongoing RCRA Corrective Action environmental investigation and remediation projects.

Mr. Jonathan P. Rizzo will serve as the project health and safety officer. Mr. Rizzo is a Senior Project Geologist with the Golder Niagara Falls, New York office, and is the Safety Coordinator. Mr. Rizzo with over 16 years of environmental experience, including administrative and technical management of environmental projects, remedial investigations, environmental audits and assessments, RCRA investigations and corrective actions, hydrogeologic characterizations, groundwater monitoring program implementation, permitting, environmental health and safety compliance, and pollution prevention. Additional project experience includes environmental due diligence and EHS audits, remedial design and remedial construction, and solid/hazardous waste construction quality assurance projects.

Mr. Anthony Notaro will act as the field geologist for the excavation and sampling activities for OU#1, well installation and groundwater sampling activities for OU#2, and the vapor intrusion investigation. He is a geologist with over eight year's of experience, especially with the completion of soil excavation projects and subsurface investigations. He also as experience with soil vapor intrusion studies. Mr. Notaro has a good understanding the field investigation requirements and procedures, New York geology, and soil, sediment and groundwater sampling protocols.

Mr. Peter Guy will oversee data validation and completion of the DUSRs. He is a Senior Environmental Scientist with over 15 years of experience. He organizes, develops and manages a Data Validation/Database Group; understands various analytical methodologies that would be used for various projects and keeps informed of updates and changes in the methods; performs validation and other data quality evaluations of data generated by the analytical laboratories in support of environmental projects; oversees the management of subcontract analytical laboratories in support of various projects including solicitation of bids, preparation of subcontract documents, coordination of sample bottle delivery, quality-control review of laboratory work products, and review of invoices; manages remedial investigation projects, routine Operation and Maintenance sampling programs, and preparation of reports and Quality Assurance Project Plans; and, in cooperation with other regional Golder Associates' offices, develops an integrated database management system between data validation groups and GIS to present interactive product to clients.

4.0 PROJECT HEALTH AND SAFETY

Mr. Jonathan Rizzo will serve as the Project Health and Safety Officer for the investigation. His responsibilities will include determining and, if necessary, upgrading, the level of protection required, ensuring that the work is being conducted in accordance with the Health and Safety Plan, and ensuring that the workers have received the proper training and medical clearances to work on-site. A copy of the Health and Safety Plan for this project is included as Appendix A.

5.0 SCHEDULE

Figure 3 presents the schedule for initiation and completion of the key work elements of this investigation for OU#2 at Buffalo Business Park. Provisions for significant delays due to work plan approval, weather, equipment breakdowns, or site operations have not been included within the schedule. If such delays occur, any necessary revisions to this schedule will be communicated to the NYSDEC as soon as practicable.

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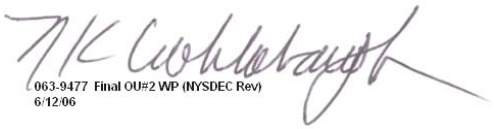
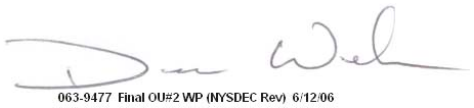


Norman K. Wohlabaugh, P.G., C.P.G.
Senior Project Manager



David C. Wehn, C.P.G.
Office Manager/Senior Hydrogeologist

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New York State Department of Environmental Conservation, 2000. Division of Water Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, October 22, 1993, Revised April 2000.

New York State Department of Health, 2005. Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Public Comment Draft.

TABLE 1 (Revised)
PROPOSED AQUEOUS, VAPOR AND AIR SAMPLES/ANALYTICAL SCHEDULE
BUFFALO BUSINESS PARK
OPERABLE UNIT #2

Location	Sample Name	Status	Flow Zone	Scheduled Analysis		
				TCL VOCs 8260	**TO 15** w/.25 ug M3 TCE	**TO 15** 1ug/M3
VCA-MW5-BR	VCA-MW5-BR	New Well	BR	✔		
VCA-MW6-BR	VCA-MW6-BR	New Well	BR	✔		
VCA-MW7-BR	VCA-MW7-BR	New Well	BR	✔		
VCA-MW8-BR	VCA-MW8-BR	New Well	BR	✔		
VCA-SV1	VCA-SV1	Sub-slab	NA		✔	
VCA-IA2	VCA-IA2	Indoor Air	NA			✔
VCA-OA	VCA-OA	Outdoor Air	NA			✔

Notes:

✔ Sample collected for laboratory analysis.
TCL = Target Compound List
VOCs = Volatile Organic Compounds
BR = Bedrock
NA =Not Applicable
Analytical method for grounddwater samples are USEPA SW846.

TABLE 2 (Revised)
AQUEOUS SAMPLE PARAMETER/CONTAINER TABLE
BUFFALO BUSINESS PARK
OPERABLE UNIT #2

Parameter Group	Analytical Method	Required Volume (ml)	Container Type	Preservative	Holding Time[1]
TCL VOCs	8260	4 x 40	G	Cool to 4°C, HCL to pH<2	14 days[2]
VOCs	TO15	1000	M	None	14 days[2]

Notes:
G: Glass, Teflon-lined septum
M: Mini can
1: Holding times begin at the time of sample receipt in the laboratory. Samples are to be received at the laboratory within 24 hours of collection.
2: From verified time of sample receipt (VTSR).
TCL = Target Compound List
Analytical Methods are USEPA SW846.
VOCs = Volatile Organic Compounds

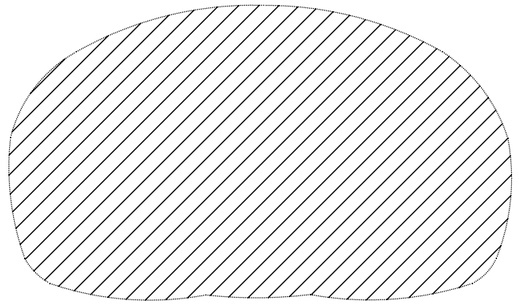
METAL-CLAD BUILDING (UNIMAIL)

VCA–MW8–BR

VCA–MW2–BR

VCA–MW7–BR

VCA–MW3–BR



VCA–MW1–BR

VCA–MW4–BR

VCA–MW5–BR

VCA–MW6–BR

BRICK BUILDING (NEW YORK FRAME, ICEE)

LEGEND

- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMITS OF EXCAVATION OU–1

25 0 25 50
scale feet

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
1	01/01/01	XXX	REV_DESC	XXX		

PROJECT

BUFFALO BUSINESS PARK, INC.
BUFFALO BUSINESS PARK VCP
TOWNSHIP, COUNTY, PROV/STATE

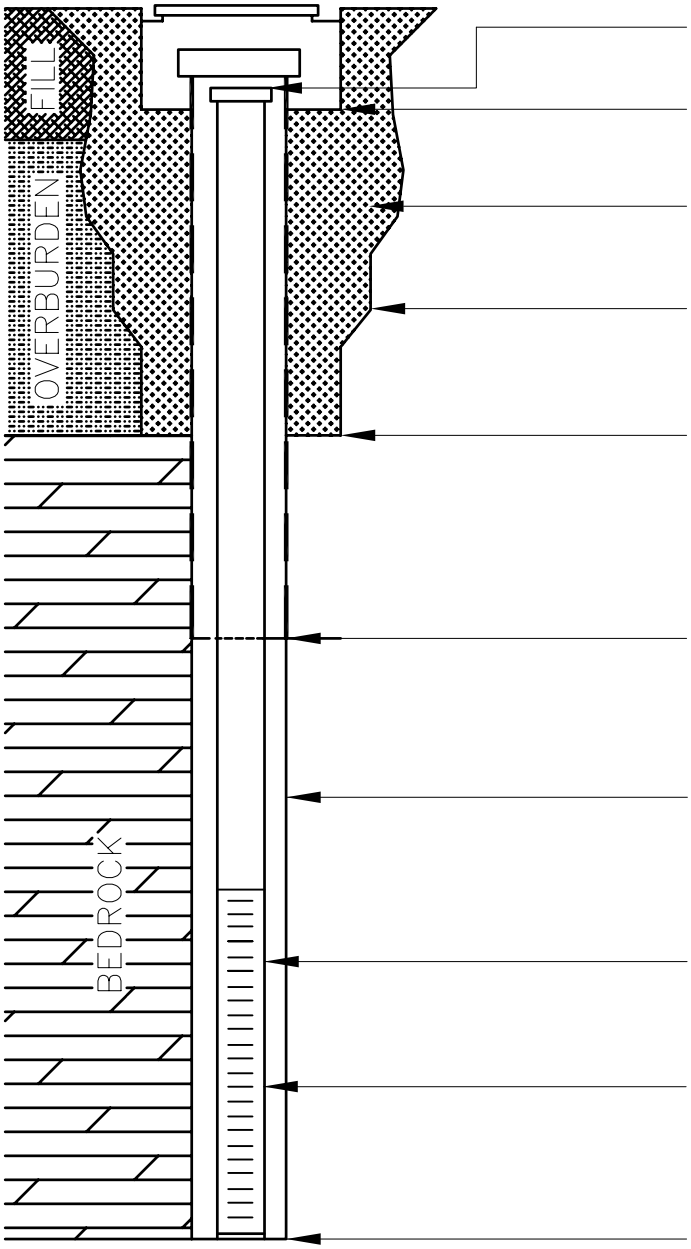
TITLE

PROPOSED MONITORING WELL LOCATIONS

Golder Associates
Buffalo, New York

PROJECT No.		063–9477	FILE No.	0639477A087
DESIGN	AJN	5/5/06	SCALE AS SHOWN	REV. 0
CADD	AJN	5/5/06		
CHECK				
REVIEW				

FIGURE 1



REFERENCE POINT
(ELEVATION ABOVE MSL)

12–INCH DEEP "CURB BOX"

CONCRETE SURFACE SEAL

11–INCH BOREHOLE

TOP OF BEDROCK
(APPROXIMATELY 15.0' bgs)

BOTTOM OF TEMPORARY CASING –
4–INCH DIAMETER STEEL
(APPROXIMATELY 18.0'–20.0' bgs)

NOMINAL 4–INCH COREHOLE

2–INCH DIAMETER PVC WELL RISER

2–INCH DIAMETER, #10–SLOT
PVC WELL SCREEN

BOTTOM OF COREHOLE
(MAXIMUM 30.0' bgs)

Golder Associates
Buffalo, New York

FILE No.	0639477A086
PROJECT No.	063–9477
REV.	0

SCALE	NTS
DATE	5/4/06
DESIGN	AJN
CADD	AJN
CHECK	NKW
REVIEW	DCW

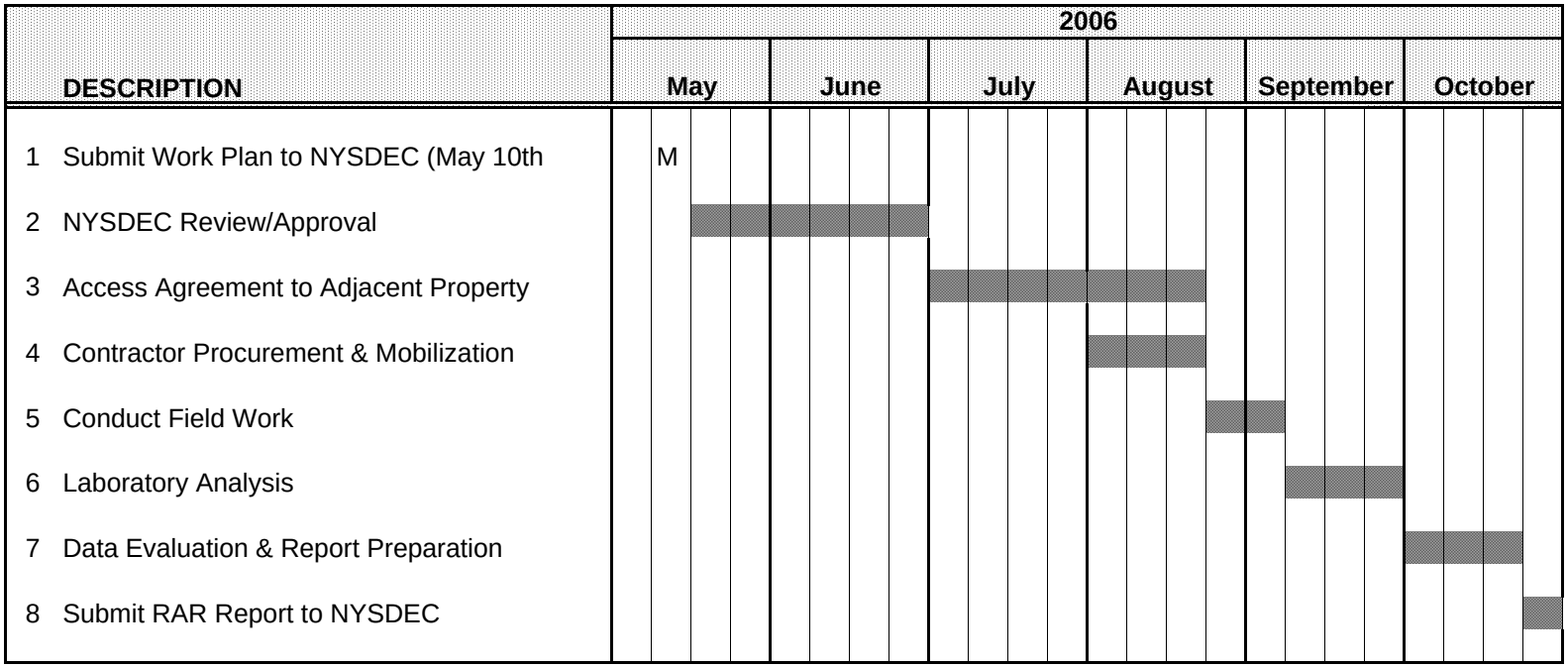
TITLE

WELL CONSTRUCTION DIAGRAM (TYPICAL)

BUFFALO BUSINESS PARK VCP

FIGURE 2

FIGURE 3 (Revised)
ESTIMATED PROJECT SCHEDULE
BUFFALO BUSINESS PARK
OPERABLE UNIT #2



NOTE:
M = Milestone

APPENDIX A

HEALTH AND SAFETY PLAN

Project Name: BUFFALO BUSINESS PARK/VOLUNTARY CLEANUP

1. Task 1 – Field Work

Proposed Start-Up Date: 4/11/06 **Project/Task No.: 063-9477**

Reviewed by Office Health and Safety Officer

Printed Name: Jonathan P. Rizzo

Signature: _____ Date: _____

Title: Senior Project Geologist

Approved by Project Manager

Printed Name: Norman K. Wohlabaugh, P.G., C.P.G.

Signature: _____ Date: _____

Title: Project Manager

2. Project Description:

This Health and Safety Plan is for field activities (soil excavation, well installation, soil and groundwater sampling and well development and soil vapor intrusion study) related to the Buffalo Business Park (BBP), Buffalo, New York. Field tasks will follow the methodologies outlined within the Investigative Work Plan for Operable Unit #2, prepared by Golder Associates, inc., and the subsequent scope of work.

3. Location:

Buffalo Business Park
1800 Broadway
Buffalo, New York 14212

4. Facility/Work Site Description:

Refer to Investigative Work Plan.

5. Proposed Personnel and Tasks:

Project Manager: Norman K. Wohlabaugh

Health and Safety Officer: Jonathan P. Rizzo

Field Team Leader: Anthony J. Notaro

Site Health and Safety Coordinator: Anthony J. Notaro

Proposed Field Team	Job Functions/Tasks
Anthony J. Notaro	Field Team Leader
Anthony J. Notaro	Site Health and Safety Coordinator

6. Confined Space Entry

A confined space is defined as any space not currently used or intended for human occupancy, having a limited means of egress, which is subject to the accumulation of toxic contaminants, a flammable or oxygen deficient atmosphere, or other hazards, such as engulfment, or electrical or mechanical hazards should equipment be inadvertently activated while an employee is in the space. Confined spaces include but are not limited to storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, air pollution control devices, smoke stacks, underground utility vaults, sewers, septic tanks, and open top spaces more than four feet in depth such as test pits, waste disposal trenches, sumps and vats.

Will this task require entry into any confined or partially confined space?

__ YES - Describe below
X NO

7. Cutting and Welding

Will this task involve use of a cutting torch or welding? ___ YES - Describe below

X NO

If cutting with a torch is required, Contractor will obtain a burn permit from BBP prior to cutting.

8. Other Potential Hazards

X Chemical	X Trips, Slips, Falls
___ Radiological	X Trenching/Shoring
___ Fire/Explosion	X Heavy Equipment/Vehicular Traffic
X Heat/Cold Stress	X Overhead Hazards
X Electrical	___ Unstable/Uneven Terrain
X Machinery/Mechanical Equipment	___ Other - Describe below

9. Description/Other

None.

10. Chemical/Radiological Hazard Evaluation

Waste Media	Hazardous Characteristics
X Airborne Contamination	X Ignitable
X Surface Contamination	X Corrosive
X Contaminated Soil	___ Reactive
X Contaminated Groundwater	___ Explosive
___ Contaminated Surface Water	X Toxic (non-radiological)
___ Solid Waste	___ Radioactive
___ Liquid Waste	___ Biological
___ Sludge	

Hazardous Substances

This task will involve the possibility of potential exposure to a range of hazardous substances at ppb to ppm levels in soil and groundwater. These include volatile organic compounds (VOCs) specifically, trichloroethylene (TCE); semi-volatile organic compounds (SVOC) and inorganics including metals, based on the Site's former use as a rail yard. BTEX compounds may be present in soils and groundwater in the subsurface.

11. Ambient Air/Site Monitoring Procedures

The following instruments shall be used to monitor the work environment and workers' breathing zones prior to site entry and at the specified intervals. Does not include Geophysical survey operations.

Instrument		Monitoring Frequency			
X PID w/10.6eV Lamp	**Cont.**	15 min.	30 min.	hourly	other _____
_____ OVA	Cont.	15 min.	30 min.	hourly	other _____
_____ Combustible Gas Indicator	Cont.	15 min.	30 min.	hourly	other _____
_____ H2S Detector	Cont.	15 min.	30 min.	hourly	other _____
_____ Colorimetric Detector Tubes	Cont.	15 min.	30 min.	hourly	other _____
_____ Other (describe below)	Cont.	15 min.	30 min.	hourly	other _____

Description/Other: Continuous monitoring of breathing zone and intermittent monitoring of removed soils.

12. Action Levels

Task personnel shall observe the following Action Levels:

Instrument	Action Level*	Specific Action
MiniRae PID	0-1 PPM	Level D
	1-10 PPM	Level C
	> 10 PPM	Leave Area/Contact Project Manager

* ACTION LEVELS ABOVE BACKGROUND (SUSTAINED) IN BREATHING ZONE. 1ppm IS THE OSHA 8-HOUR TIME WEIGHTED AVERAGES FOR THE CONTAMINANTS OF CONCERN.

13. Personal Monitoring

___ Passive Dosimeter ___ Personal Air Sampling ___ Other

Description/Other:

NOT-APPLICABLE

14. Biological Monitoring/Medical Surveillance

_____ This project requires medical surveillance or biological monitoring procedures beyond the provisions of the routine medical surveillance program, see description below

Description:

NO ADDITIONAL REQUIREMENTS

15. Onsite Control

Control boundaries may be established, boundaries which may be applicable include the Exclusion Zone (the contaminated area), Contamination Reduction Zone and Support Zone (clean area) and will be designated as appropriate. At a minimum, the following will be performed:

1. MINIMIZE DERMAL CONTACT WITH SOIL AND GROUNDWATER.
2. WRAP TESTING AND SAMPLING EQUIPMENT BETWEEN SAMPLING LOCATIONS.
3. DECON TESTING AND SAMPLING EQUIPMENT AT JOB COMPLETION

The Golder Field Team Leader has been designated to coordinate access control on the work site during this task. No unauthorized person shall be allowed beyond the Contamination Reduction Zone line. In traffic areas the work area will be cordoned off with safety cones.

16. Personal Protective Equipment

Location	Job Function/Task	Initial Level of Protection
Exclusion Zone	Testing and Sampling	B C **D**
	0-1 PPM	B C **D**
	>1-10 PPM	B **C** D
		B C D
		B C D
Decontamination Zone	Cleaning Sampling Equipment	B C **D**
Support Zone	General	B C **D**
		B C D

List the specific protective equipment and material (where applicable) for each of the Levels of Protection identified above

Level B ___

___ Pressure demand airline
___ Pressure demand airline with escape provisions
___ Pressure demand SCBA
___ LEAVE WORK AREA

Level C

_X_ Half face Air Purifying Respirator
___ Full face Air Purifying Respirator
___ Full face canister Air Purifying Respirator
_X_ TYVEK SUIT (with reflective orange vest in traffic areas)

Level _D_

_X_ HARD HAT AND SAFETY GLASSES
_X_ RUBBER BOOTS/STEEL TOED BOOTS
_X_ INNER GLOVES (latex)
_X_ OUTER GLOVES (NITRILE)

Where air purifying respirators are authorized, organic vapor/acid gas are the appropriate canisters/cartridges for use with the specific substances and concentrations anticipated.

NO CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL BE MADE WITHOUT THE KNOWLEDGE AND APPROVAL OF THE HEALTH AND SAFETY OFFICER AND THE PROJECT MANAGER

17. Decontamination

Personnel and equipment leaving the Controlled Zone (if applicable) shall proceed through the following decontamination stations and procedures from the decontamination zone:

Personnel Decontamination

Station		Procedure
	1.	WASH BOOTS AND OUTER GLOVES
	2.	REMOVE HARD HAT
	3.	REMOVE AND DISPOSE OUTER GLOVES
	4.	REMOVE AND DISPOSE OF TYVEK SUIT
	5.	REMOVE RESPIRATOR (IF APPLICABLE)
	6.	REMOVE AND DISPOSE OF INNER GLOVES

Equipment Decontamination
(TESTING AND SAMPLING EQUIPMENT ONLY)

Station		Procedure
	1.	ALCONOX WASH
	2.	POTABLE WATER RINSE
	3.	AIR DRY

The following decontamination equipment is required: Alconox, steam cleaner, rinse water, buckets, brushes.

Emergency decontamination procedures: Remove PPE and rinse off with water.

Rinsate, decon and investigation derived waste materials will be contained in containers and disposed of by BBP. Water will be provided at work locations by connection to Buffalo Business Park potable water supply system. An eyewash station/ bottles will be available in the field.

18. Confined Entry Procedures __X__ Not Applicable

Yes	N/A		Yes	N/A	
__	__	Provide Forced Ventilation	__	__	Refer to Personal Protective Equip. (#16)
__	__	Test Atmosphere For:	__	__	Refer to Emergency Procedures (#24)
__	__	(a) $\%O_2$	__	__	Other Special Procedures
__	__	(b) %LEL			
__	__	(c) Other			

Descriptions/Other:

19. Cutting/Welding Procedure __X__ Not Applicable

20. Electrical _____Not Applicable

Drilling contractor will be required to maintain safe distances from any overhead or underground electric / power lines.

Utility clearance to be performed by prior to drilling/subsurface activities.

21. Onsite Organization and Coordination

Project Manager: Norman K. Wohlabaugh
Field Team Leader: Anthony J. Notaro
Site Health and Safety Officer: Anthony J. Notaro

Field Team **Name**	**Job Function**
Anthony J. Notaro	Field Team Leader and Site Health and Safety Coordinator
Wargo Enterprises, Inc.	Excavation Contractor (provide own HSE Plan)
Pariso Trucking	Trucking/Hauling Contractor

22. Special Instructions

All personnel must attend a pre-job tailgate safety meeting prior to commencing work. Excavation and drilling contractors to perform utility clearance prior to any drilling/subsurface activities. Personnel will choose excavation and drilling locations in advance of operations and will be on Site to point out locations to Golder field personnel. Check with Golder Project Manager and local operations personnel prior to job start up for any area specific hazards or issues.

23. Sanitation Requirements

Potable water supply available on work site? __X__ Yes ____ No

Portable toilets required on work site? ___ Yes If Yes, how many? _____
_X_ No

Temporary washing/shower facilities required at work site? ___ Yes If yes, describe below.
__X__ No

Description: restroom and wash room facilities will be available to Golder personnel.

24. Field Procedures Change Authorization (N/A)

Instruction Number to be changed

Duration of Authorization Requested
___ Today only
___ Duration of Task

Date:

Description of Procedures Modification:

Justification:

Person Requesting Change:

Verbal Authorization Received From:

Name

Name

Time

Title

Title

Signature

Approved By
(Signature of person named above to be obtained within 48 hours of verbal authorization)

25. Emergency Procedures This page is to be posted at prominent location on site.

Yes	No	
X		On-site Communications Required? Emergency Channel 911

Nearest Telephone Cellular phone on-site – (716) 380-4160 (Anthony J. Notaro)

Station Manager Office or Field Team Leader

Fire and Explosion

In the event of a fire or explosion:

1. Notify emergency personnel by calling 911.
2. If possible, isolate the fire to prevent spreading.
3. Evacuate the area.

Chemical Exposure

The site health and safety officer will notify the Golder Project Manager and/or Health and Safety Officer immediately in the event of any injury or any of the signs or symptoms of overexposure to hazardous substances.

On Site Injury Or Illness

In the event of an injury requiring more than minor first aid, or any employee reporting any sign or symptom of exposure to hazardous substances, immediately contact the Golder Health and Safety Coordinator. In the event of life-threatening or traumatic injury, implement appropriate first-aid and immediately call for emergency medical assistance by dialing 911.

In the event of an injury requiring more than minor first aid, or any employee reporting any sign or symptom of exposure to hazardous substances, immediately contact Norm Wohlabaugh, Phone (716) 215-0650. In the event of life-threatening or traumatic injury, implement appropriate first-aid and immediately call for emergency medical assistance by dialing **911**. Medical facilities include **St. Joseph's Hospital, Phone (716) 891-2400; Erie County Medical Center, Phone (716) 898-3000; and Sisters of Charity Hospital, Phone (716) 862-1000.** All hospitals are located within a ten minute drive from the Site.

Designated Personnel Current in First Aid/CPR (Names)

Designated Back-Up Personnel (Names)	Function

Required Emergency Back-Up Equipment

26. Safety Briefing

The following personnel were present at pre-job safety briefing conducted at _____(time) on_____(date) at _____(location), and have read the above plan and are familiar with its provisions:

Name	Signature

Fully charged Class ABC fire extinguisher available on site? YES _____

Fully stocked First Aid Kit available on site? YES _____

All project personnel advised of location of nearest phone? YES _____

All project personnel advised of location of designated medical facility or facilities? YES _____

Golder will perform HSE audits (minimum of one) for this project.

_____

Printed Name of Field Team Leader or Site Safety Officer

_____

Signature Date

APPENDIX A
PROPOSED SCOPE OF WORK