Final Construction Work Plan for Permeable Reactive Barrier Installation

Former Miller Container Plant
Volney, NY

Prepared for:

Miller Brewing Company
Milwaukee, WI

Prepared by:

URS
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1.0 INTRODUCTION

This Work Plan meets project-specified requirements for remedial construction at the Former Miller Brewing Container Plant in Volney, New York. This document supplements the specifications and construction drawings and details construction activities. See specifications and construction drawings for plans for the construction of the permeable reactive barriers (PRB). See the Site Health and Safety Plan for requirements and plans concerning site and worker safety.

This plan includes descriptions of equipment, excavation methods, mixing methods, slurry usage, soil-cement-bentonite (SCB) backfill preparation and placement, and zero-valent-iron/sand (ZVI) backfill preparation and placement. This plan provides a description of material, quality control (QC) equipment, tests, sampling, QC forms, and the proposed off site laboratories.

The scope of this plan details the construction activities and testing for two PRBs. PRB-1 consists of a trench constructed by the bio-polymer (BP) slurry trench method backfilled with a ZVI and sand mixture. When properly constructed in the design configuration, PRB-1 will intercept and treat constituents of concern in the groundwater. PRB-2 consists of a series of four (4) soil-cement-bentonite (SCB) barriers walls and three (3) zero-valent-iron (ZVI)/sand backfilled trenches constructed by the BP slurry trench method. When properly installed in the design configuration, the SCB and ZVI form the underground structure of PRB-2 to direct constituents of concern in the groundwater through the PRB ZVI cells for treatment.

2.0 KEY PERSONNEL AND ORGANIZATIONAL STRUCTURE

URS Corporation will self perform this project. URS will provide engineering, labor, standard construction equipment, and overall supervision for the PRB construction. Key project staff include:

2.1 Project Manager

The Project Manager is the primary client contact and with the assistance of the Site Manager, directs the construction of the project works. The responsibilities of the Project Manager include the following:

- Overall direction of the project;
- Communication with Miller Brewing, Crysteel Manufacturing, Town of Volney, City of Fulton, and other stakeholders;
- Control of project costs;
- Subcontractor relations; and
- Quality assurance and technical direction

The URS Project Manager will be present on the project site as needed, and will be in daily contact with the Site Manager. The URS Project Manager, James Imbrie, can be contacted at (414) 831-4115 or (262) 613-3883 (cell).

2.2 Site Manager

The Site Manager leads the day-to-day field activities under the direction of the Project Manager. The Site Manager's specific responsibilities include:

- Labor and equipment productivity;
- Coordination of subcontractors;
- On-site project administration;
- Documentation of costs and quantities;
- Purchasing of day-to-day items;
- Directs the daily site activities;
- Places greatest priority on ensuring all site activities are in compliance with the HASP and Work Plan; and
- Responsible for delivery, maintenance & safe operation of equipment.

The URS Site Manager, Gary Stenger, can be contacted at (414) 788-8484 (cell).

3.0 USE OF SITE

Permission for site access has been obtained by URS. On-site operations will be limited to those areas specified on the Drawings. Landscaped areas and developed parking lots will not be used for site activities to the extent practicable. Access will be coordinated with the Project Owner and Site Owner. At no time will personnel access the site without the knowledge and consent of the Project Manager, Project Owner and Site Owner. Site access will be maintained at all times for the Site Owner.

Health and safety of all on-site personnel and the protection of all equipment and materials is a very important part of this project. Refer to the Site Health and Safety Plan for requirements regarding site and personnel safety.

The slurry trench construction generally consists of three major operations, all executed simultaneously and coordinated with each other. The first is slurry mixing. Slurry mixing in this case will be accomplished with a slurry mixer. Slurry will be prepared from bentonite and water for the soil-cement-bentonite (SCB) construction. Slurry will be prepared from bio-polymer and water for the ZVI construction.

The second operation is excavation. This is accomplished with a specially modified, long-stick hydraulic excavator. The excavator has the capability to dig up to 85 feet deep.

The third operation is the mixing and placing of the backfill. For the ZVI sections, the backfill consists of a mixture of granular iron and sand. For the barrier sections, the backfill is SCB.

Once the long-stick excavator reaches the planned end of each trench section, excess slurry is wasted (mixed with dry soils) or degraded (in the case of BP slurry) to permit the completion of backfilling. Upon completion of trench construction, any excess soil will be spread over the site upgradient of the PRB, incorporated into the re-graded surface, and landscaped. Excess soil spread over the site will not contain SCB slurry.

4.0 PROJECT PERMITS

The following project permits and access agreements were obtained:

- Building Permit from the Town of Volney;
- Oswego County Highway Permit for roadwork in the Oswego County Highway 57 right-of-way (ROW) for PRB-1. The County Highway Permit does not allow placement of PRB-1 within the Highway ROW. It only allows entrance into the ROW while performing PRB installation on City of Fulton Property.
- Access agreement for the Crysteel facility; and
- Access agreement for the City of Fulton municipal well field.

The URS Project Manager will obtain a permit to use City of Fulton water for construction activities. URS will obtain permits and certifications for soil disposal, as necessary, at the Waste Management – Rochester landfill or other landfill if necessary. The Project Owner or representative will sign the Waste Manifests. Approximately 1,500 CY of spoils will require attention at the end of the project. This soil will be tested using the Toxicity Characteristic Leaching Procedure (TCLP). Soil that fails this test will be disposed of at the approved landfill. Soil that passes this test will be spread in a layer 1-2 feet thick on-site, upgradient of the PRB. The soil will be shaped to match the present site drainage conditions and covered with topsoil and seed.

5.0 PROJECT MEETINGS

Records will be made of any meetings conducted at the site or in conjunction with site activities. The URS Construction Manager or appointed designee will record and distribute the minutes. The minutes will include any significant proceedings and decisions. After each meeting, a copy of the meeting minutes will be distributed to each meeting participant, the URS Project Manager, parties affected by the decisions made, and the project file.

5.1 Pre-Construction Meeting

Before construction starts, the URS Project Manager will schedule a Pre-Construction Meeting at a time convenient to the Project Owner, the State, and the Site Owner. The purpose of this meeting will be to

review responsibilities, health and safety issues, and personnel assignments. Those invited to the Pre-Construction Meeting will be the URS Project Manager or designated representative, URS Site Manager, QC personnel, safety personnel, and any major subcontractor's superintendents.

5.2 Progress Meetings

The URS Project Manager will schedule and administer progress meetings once every week during construction activities or at a frequency otherwise identified. Additional meetings may be requested when it is necessary to raise any significant questions, establish new guidelines, introduce a new aspect to the project, or any other items that will affect work progress.

6.0 CONSTRUCTION PHOTOGRAPHS

Photographs will provide a complete construction record of events including progression of work, potential and actual problems and solutions, and actual conditions that may vary from anticipated, shown, or indicated contract conditions.

Before construction begins, photograph existing conditions at the site and existing access. During construction, photograph all major work activities as necessary to provide complete documentation of work performed. Before demobilization from the site, photographs will be taken to document site conditions at the end of construction.

7.0 QUALITY CONTROL

URS will maintain the Quality Control (QC) and Quality Assurance (QA) program for the PRB installation. The designated representatives of the URS Project Manager will act as the QC and QA officers. In general, the QC/QA system consists of plans, procedures, and organization necessary to produce an end product that complies with the Specifications. The system covers construction operations, on site and off site. QC/QA testing complies with the pertinent codes, regulations, and standards referenced in the Construction Drawings and Documents. Final acceptance of materials will be based on a review of QC test results as well as visual observations during construction.

7.1 Construction Quality Control/Construction Quality Assurance Plan

The CQCP and CQAP identify personnel, procedures, control, instructions, tests, records, and forms to be used. The CQCP and CQAP cover the Work, including work by subcontractors, and suppliers. Appendix A, in conjunction with this section of the Construction Work Plan, describe detailed CQCP/CQAP.

7.2 Quality Control/Quality Assurance

QC/QA will be conducted in accordance with the CQCP/CQAP to ensure that the Work, including that of subcontractors and suppliers, complies with the requirements of the Construction Documents. Testing is presented in the individual Specifications.

URS will perform the tests required to verify that QC/QA measures are adequate. Testing includes the operation and acceptance tests specified. URS will procure the services of an approved testing laboratory. The list of tests is furnished as a part of the CQCP/CQAP.

The URS Site Manager will maintain current records on-site of QC operations, activities, and tests performed, including the work of subcontractors and suppliers. These records will include factual evidence that required QC activities and tests were performed. The Project Manager will maintain a second set of QA/QC records.

7.3 Quality Control Equipment

The following equipment is employed in measuring, testing and sampling the slurry trench materials at the site:

No. Units	Equipment	Test	Standard Method
1	Mold and rod	Slump	ASTM C 143
2	Marsh Funnel & Cup	Viscosity	API RP 13B
1	Filter press	Filtrate loss	API RP 13B
2	Mud balance	Density	API RP 13B
1	Slurry sampler	Sample in-trench slurry	None
2	pH paper	pH	API RP 13B
1	Pocket Penetrometer	UCS	ASTM D1158
1	Scale and magnet	Magnetic Separation	ETI 3.08

Testing requirements, including frequency and number of samples, are summarized in the QA/QC activities table in Appendix A. The following procedures will be used to streamline the on-site testing program:

1. Grain size determinations are made at the off site laboratory.
2. Color-coded pH paper is used instead of a pH meter because a pH meter would be damaged by the material being tested.
3. Density of the SCB and ZVI backfill is measured with a large mud balance.
4. All permeability testing will be done at the off site laboratory.
5. UCS testing may be performed on site or off site laboratory.

The off site laboratory proposed for the Site QC work is CME Associates, Inc., 527 South Main Street, Central Square, NY 13036.

7.4 General Sequence of Quality Control Operations

Testing requirements, including methods and acceptance criteria, are summarized in the QA/QC activities table in Appendix A. The typical day of QC activities is given below. The daily forms for QC/QA are included in Appendix A.

1. Each morning's inspections include:
   - Sound bottom of trench, compare to previous day's sounding.
   - Test fresh and in-trench slurry and grout.
   - Test backfill. Obtain samples for off site testing.
   - Inspect backfill mixing and placement.
   - Inspect nature and conditions of soils for potential reuse.
   - Observe trench excavation measurements and depth of key into till.

2. Each afternoon's inspections include:
   - Test fresh and in-trench slurry and grout.
   - Test backfill.
   - Supervise backfill mixing and placement.
   - Inspect nature and conditions of soils for potential reuse.
   - Observe trench excavation measurements and key.
   - Supervise cleaning of trench bottom and minimize distance between backfill toe and excavation. Sound trench and backfill.

3. The next morning's activities are included for comparison with the previous day's results as follows:
   - Sound trench and backfill. Compare with previous afternoon's soundings.
   - Complete QC forms and submit to Field Engineer. Field Engineer completes QA forms and submits QC/QA forms to Project Manager and records in field project file.
   - Continue with daily inspections.

7.5 Test and Sampling Procedures

Standards for testing and sampling procedures are listed in above. Additional details for several items are given below.

1. Sounding instrument – The sounding instrument (a.k.a. Sounding cable) consists of a fiberglass surveyor's tape with a heavy metal weight attached. The weight hangs below the tape when measuring, and the length of the weight is subtracted (or the end of the tape is modified) from the measurement to give a true reading. Several designs for the weight are available. The sounding cable is used to measure the depth of the trench. In order to obtain the elevation of the bottom of the trench, the work platform is surveyed and the depth from the work platform is subtracted from the elevation of the work platform.

2. Slurry sampling – Sampling shall use the following methods as described. The primary method employed is to remove slurry by dipping the backhoe bucket through a zone in the trench. This method requires the operator to trap the slurry with a rapid action and may not be successful at all depths. In the case where this method is not successful, an alternate method is to use a rope-type slurry bailer. Slurry bailers are custom-made and can obtain about one quart per sample.

7.6 Quality Control Forms

Copies of QC forms are included in Appendix A. The forms are titled BACKFILL SLOPE, EXAMPLE – AS-BUILT SLOPE DATA, SLURRY EXCAVATION, IRON/SAND BACKFILL, FRESH POLYMER SLURRY, and TRENCH POLYMER SLURRY. These forms are completed daily (as appropriate for phase of project), maintained on-site, and presented to the QC supervisor the following day. A computer-generated cross-section of the trench and backfill is produced from the data included on the sheet titled BACKFILL SLOPE. The forms and data are maintained on-site in hard copy and on a laptop computer.

8.0 BASIC MATERIALS

The basic materials for construction include water for slurry and grout mixing, native soils from the trench excavation (i.e. trench spoil), bentonite clay, Portland cement TYPE 1, bio-polymer (a mixture of guar gum and preservatives), graded sand, and granular iron. Preservatives may be used to stabilize the guar during construction of PRB-1 and PRB-2 gates. The preservatives are degraded during the guar break process. Refer to the specifications for detailed requirements of these materials. Water is being provided from the City of Fulton. Bentonite is being provided to the project site from mines in Wyoming in 100# sacks and 3000# bags. Cement is being obtained from storage silos in Fulton and will be provided in bulk. Sand is being provided by Northern Aggregates from their local pit and will be trucked to the site in ready mix trucks with the granular iron. Bio-polymer is being provided from sources in Pakistan and India. Granular iron is being provided from sources in Michigan in 3000# bags and stored at Northern Aggregates until ready for mixing with sand.

9.0 SITE PREPARATIONS AND LAYOUT

The Work will include mobilization and demobilization of personnel, equipment, supplies, and incidentals. The PRBs are constructed to create underground structures that accept groundwater flow for the treatment of constituents of concern by ZVI. PRB-1 is constructed along Oswego County Highway Route 57 to an average depth of about 50 ft. PRB-2 is constructed west of the Crysteel Manufacturing Facility to an average depth of about 76 ft.

9.1 Mobilization

Mobilization will include furnishing, installing, and maintaining all signs, support zone facilities, securing storage areas for equipment, parking areas, and sanitary and utility services. Additionally, it includes installing the field construction trailer.

9.2 Demobilization

URS will disconnect and remove all temporary utilities, repair any erosion or runoff-related damage to the project site and restore the site. URS will also dismantle, properly dispose of, and/or remove from the site the temporary and supporting facilities, including, but not limited to the access roads, material staging area, and temporary office trailer erected on site for the Work. URS will remove all equipment, materials, debris, trash, and any other items associated with conducting the Work to restore the site.

10.0 TEMPORARY SITE FACILITIES AND SERVICES

The facilities specified will be located on site or within the temporary facilities area as shown on the Construction Drawings. URS will meter and purchase utilities (electric and water) at the site by connecting to the utilities at approved locations and installation types (as necessary). The materials will be suitable for their intended use and will conform to applicable codes and standards. Manufacturers' requirements will be strictly adhered to.

Before installation of the temporary site trailer and storage facilities, URS will consult with the Project Owner and the Property Owner with regard to location and access. Sanitary facilities will be provided at the field trailer. Water for workers consumption will be provided in the field trailer. Temporary site facilities and services will be removed after construction is complete.

10.1 Site Layout

Slurry trench construction relies upon an excavator digging the trench, a slurry mixing plant located at the staging area, and a working area alongside the trench for mixing and processing of the materials to place in the trench. Tentative locations for the slurry mixing plant, storage areas, and working area are shown on a sketch in Appendix B. The actual location will be finalized during mobilization.

10.2 Requirements of Regulatory Agencies

Electricity and lighting will be in accordance with federal, state, and local regulations as well as local utility company requirements. Work will be in accordance with the National Electric Code (NEC). Sanitary facilities and disposal of sanitary wastes will be in accordance with state and local regulations. Utilities will be in full compliance and coordinated with the local control authority.

10.3 Temporary Facilities and Services

Temporary facilities include field/office trailer, equipment and supply storage areas, and parking and site access roads. Temporary utilities include electricity and lighting, communications, water, and sanitary waste.

Temporary electric service for the site will be provided to the office trailer by connecting to existing service at the site. Other service for miscellaneous equipment will be generated on site by a generator. URS will disconnect and remove the temporary electrical and lighting systems at the completion of the Work.

URS will utilize cellular phones for communications.

Waste from sanitary facilities will be collected for subsequent transfer to an off-site sewage disposal facility. Temporary toilet facilities will be the chemical type toilets. Hand cleaning facilities will be provided at or near all sanitary toilets. Waterless cleaning may be used.

Water will be obtained from the City of Fulton from fire hydrants on-site. Water usage is expected to peak at 100,000 gal per day. In order to provide adequate supply without exhausting City resources, several portable tanks (frac tanks) will be stationed at the slurry mixing area to permit the storage of water (as needed).The water will also be available for any other construction activities including slurry mixing, decontamination of equipment, dust control, quality control testing, etc., through standard garden hoses. An adequate supply of potable water will be provided for workers in the office trailer.

Construction traffic (truck route, site routes, use of existing roads) on roads selected for hauling material to and from the site will interfere as little as possible with public and facility traffic. Temporary roads for construction will be created along the alignment of PRB-2 using stone to provide a stabilized construction pad. Dust control methods will be adequate to ensure safe operation at all times and be in conformance with dust control. Temporary barricades will be erected and maintained as shown on the Traffic Control Plan (See Appendix C). Barricades will be securely placed and clearly visible with adequate illumination to provide sufficient visual warning of hazards at day and night.

Public roads will be maintained in a clean and safe condition. All mud/soil track-out will be cleaned from the public road surfaces as necessary, at the end of each shift.

11.0 FIRE PREVENTION AND PROTECTION

URS will provide fire prevention and protection as required in the HASP. Fire prevention and protection procedures will meet laws, ordinances, and construction requirements. Materials and work furnished will be in accordance with federal, state, and local laws, ordinances, and regulations.

URS will provide portable fire extinguishers (UL listed for Class A, B, and C Fires; minimum rating 2A-10 B:C) and any other equipment necessary for fire prevention and protection. Placement of fire extinguishers will be according to the Health and Safety Plan, Safety Management Standard 14.

Fire prevention procedures include no smoking at or in the vicinity of operations that present a fire hazard. All flammable and combustible liquids will be labeled, handled, and stored in accordance with applicable laws and regulations. Transfer of flammable liquids from one container to another will only be when the containers are electrically interconnected (bonded). Equipment motors will be shut off during fueling to prevent explosion hazards.

12.0 DUST CONTROL

The creation and dispersion of dust will be minimized during all construction activities. Water will be applied with discretion to prevent muddy conditions, runoff, or soil tracking. Dust creation monitoring and remediation will be at the discretion of the Construction Manager and Project Manager.

13.0 HEALTH AND SAFETY PLAN

URS has developed and will implement a written site Health and Safety Plan (HASP) which complies with applicable federal, state, and local regulations. The URS Health and Safety Officer, Gary Stenger (Site Manager), is responsible for implementing the HASP. Subcontractors will prepare their own HASP in accordance with URS procedures. URS will provide the facilities, equipment, materials, and personnel necessary to protect URS and Subcontractor personnel from physical injury and potential adverse health effects due to exposure to chemical hazards. Constituents of concern can be found in the HASP for the site.

The URS and subcontractor HASPs were submitted to the Regional Health and Safety Officer for review and approval prior to the Pre-Construction Meeting. At the completion of the work, URS will produce a Closeout Safety Report. The report will be maintained by URS and submitted to the Regional Health and Safety Officer. The report will include procedures and techniques used to decontaminate or dispose of equipment and facilities. The report will also include a summary of the safety and health aspects of the entire project.

14.0 SPILL PREVENTION AND CONTROL

Qualified personnel and appropriate facilities necessary for quality spill prevention and control will be furnished by URS. The spill prevention and control procedures will be in accordance with applicable Federal, State (6 NYCRR Part 360-14), and local laws, regulations, and good engineering practices. Spill prevention will be designed to protect human health and the environment. The Project Manager is the responsible individual in an emergency. First aid will be according to the HASP. The requirement for air monitoring is not anticipated unless there is an inhalation hazard. A Photoionization Detector (PID) will be used on-site to monitor the air. There is no anticipated off-site health risk.

14.1 Spill Prevention Measures

The spill prevention and control procedures include appropriate containment and diversionary structures to prevent discharge of materials from the environment. The potential for spill will occur during re-fueling of equipment and vehicles. Appropriate structures include berms sufficiently impervious to contain spill materials, or booms and other barriers, and sorbent materials.

Special measures will be used to prevent fuels, oils, greases, and waste washings from entering the air, waters of the State, utilities, and storage areas (as necessary). The measures to be used at this site include earthen berms and sorbent materials. Sorbent materials will be on-site, ready for use. Areas will not be polluted with manmade or natural harmful materials. Materials will be disposed of off site in accordance with applicable federal, state, and local laws and regulations. Water features will be protected with a silt fence. Soil contaminated by a spill will be excavated and properly disposed of it in accordance with applicable regulations and procedures.

Inspection procedures and a record of the inspections, signed by the appropriate supervisor or inspector, will be maintained in the project files.

14.2 Personnel Considerations

Personnel will be advised regarding applicable pollution control laws, rules, and regulations and in the operation and maintenance of equipment to prevent the discharge of materials. The Field Engineer is accountable for material spill prevention and will report to site management.

15.0 DECONTAMINATION PROCEDURES

Personnel and equipment will be decontaminated during construction activities to prevent the possible spread of contamination into clean zones, as well as reduce exposure to personnel and the environment. Detailed decontamination procedures are given in the HASP, submitted under separate cover. Contamination is minimized between the major phases of this project and, as a result, is only necessary at the end of the project.

16.0 CLEARING AND GRUBBING

Clearing and grubbing and the replacement of trees or bushes removed may be necessary in the course of the Work. Clearing consists of the trimming, and cutting of trees, logs, etc, and the satisfactory disposal of the trees and removing and disposing of other vegetation designated for removal, including downed timber, snags, and brush occurring in the areas to be cleared as shown in the Construction Drawings and described in the Specifications. Materials from clearing and grubbing will be disposed of at an approved off-site waste disposal facility, unless otherwise directed by the URS Project Manager. If the materials from clearing and grubbing are not disposed of at an approved off-site facility, the NYSDEC will be notified.

Grubbing consists of the removal and disposal of stumps, roots larger than one (1) inch in diameter, and matted roots from the designated grubbing areas, in particular the trees near PRB-1 located on the City of Fulton property. Grubbed material will be removed to a depth of not less than six (6) inches below the surface. Fill holes or depressions left from the grubbing operations to the original adjacent surface grade with compacted Random Fill in accordance with the specifications.

17.0 EROSION AND SEDIMENT CONTROL

Erosion and sediment control is required to control erosion of the soils associated with the Work and to limit discharge of turbid water and sediment into streams and waterways in accordance with federal, state, and local laws and regulations and required permits.

The erosion and sediment control methods and materials are described in the specifications (Section 02370), on the Construction Drawings, and in the Erosion Control Plan (See Appendix D). Temporary erosion and sediment control measures will be installed and maintained before, during, and after construction in accordance with the Erosion Control Plan.

18.0 REMOVAL/DEMOLITION OF ASPHALT

As part of the installation of PRB-2, some asphalt pavement will be removed from the Crysteel Manufacturing Facility entrance roadway. The lines to be cut across the road will be first painted with bright, fluorescent spray paint. Then, the asphalt is cut with clean, straight cuts using the paint lines as a guide.

Cutting and removing the asphalt should be completed in coordination with Facility traffic patterns. The asphalt will be carefully removed with an excavator or loader bucket and loaded out. It is loaded into the roll-off container for disposal at a non-hazardous disposal facility.

If necessary, a temporary stockpile of asphalt is created in an area away from the excavation. However, the stockpile will be easily accessible without additional damage to the ground cover.

Asphalt demolition activities are monitored for dust. If there is an occurrence of sustained visible dust, the area will be wetted via water hose to control dust emissions.

When the trench excavation in the area of the roadway is complete, the area is backfilled as shown on the Construction Drawings but the compacted aggregate backfill is raised to the level of the surface of the existing asphalt pavement. Until arrangements are made during site restoration to replace the asphalt pavement, the Facility traffic will travel over well-compacted aggregate backfill in the area of the trench excavation. The asphalt pavement will be restored as soon as technically and logistically feasible following construction. If the weather does not permit quality installation (i.e. cold), work will likely be postponed until conditions are favorable.

19.0 SURVEYING

A professional surveyor will conduct a site survey to establish PRB survey markers, and locate monitoring and maintenance wells to complete this Work. URS will also perform additional surveying, as necessary, during the course of the construction. URS will check alignment of the PRBs during construction, as well as verify other points pertinent to the Work. The control points (survey markers) are shown on the Construction Drawings. Surveying of the as-built locations will be conducted by a qualified land surveyor under the direction of a registered professional land surveyor in the State of New York. After a survey is conducted, survey data and field notes will be submitted to the URS Project Manager.

Surveying will be conducted and reported with coordinates in the plant coordinate system and elevations in feet above mean sea level (MSL) using the North American Datum (NAD), 1983 and the North American Geodetic Vertical Datum (NGVD), 1929. The survey work will be performed to the nearest 0.1 feet plus or minus 0.05 feet for horizontal distance and to the nearest 0.01 feet plus or minus 0.005 feet for elevation.

Location control for the PRBs during this project will be accomplished in three steps as follows:

- For control survey services, the subcontracted surveyor will be utilized as described above. Tasks for the surveyor will include:
    - Establishment of starting and ending points, corner locations, and line and grade stations at 100 ft intervals. Elevations to be established are those of the PRB work area.
    - Upon completion of PRB, survey subcontractor will be recalled to develop a record drawing of the entire project.
- For operating layout work that occurs almost daily, the URS Construction Manager will delegate to URS staff to perform survey work using tape measurements from the previously-surveyed monuments including:
    - Offsets of corner monuments,
    - Intermediate stations, with offsets
    - Levels for control of working area and PRB for measuring elevation of the bottom of the trench, top of iron/sand, and top of compacted soil cap, etc.
    - Level and width of the cap over the PRB.

20.0 MONITORING WELL PROTECTION REQUIREMENTS

Flagging and barricading or fencing protects existing monitoring wells before beginning works in the area of a well. Protective flagging should be of sufficient height to be clearly visible to equipment operators at a distance of at least 25 feet. A spotter is assigned for the purpose of controlling equipment when work is near a well (within a five (5) foot radius), or whenever there is a potential for well damage.

The URS Site Manager will promptly report to the URS Project Manager the loss, damage, or destruction of any monitoring well. The URS Project Manager will notify the NYSDEC. Damage to monitoring wells will be investigated and replaced or repaired, at the discretion of the URS Project Manager and the NYSDEC.

21.0 NEW MONITORING WELLS

Refer to the specifications for requirements regarding new monitoring wells.

22.0 TRENCH EXCAVATION EQUIPMENT

The slurry trench is excavated with a modified Koehring 1466 (150 tons). The excavator has the capability to excavate up to 85 feet deep in its current configuration. Greater depths are possible with modification to the excavator. The excavator is equipped with a 2-foot wide bucket. There are two separate buckets for use at this site. One bucket is for routine operations and the second bucket is for excavating into the till layer. The bucket used for excavating into the till layer is equipment with 'tiger teeth' to improve results and reduce damage. The excavator will be supported on timber construction mats when working or traveling.

23.0 TRENCH EXCAVATION METHODS

23.1 Standard Procedure

The trench is excavated under slurry with a hydraulic excavator. The standard procedure for excavation is as follows:

1. Begin a new excavation on the centerline by digging a trench less than 4 feet deep and about 15 to 20 feet long (a.k.a. one "panel" or "cut") without slurry.
2. Introduce slurry into the excavation.
3. Continue the excavation to depth and remove the soil between the newly excavated trench (new "panel") and the previous trench (previous "panel") so that the trench is continuous.
4. Excavate to the elevations, as shown on the plan drawings or as determined by site stratigraphy. Sound final depth and record.
5. Clean the bottom of the excavation by repeated passes of the bucket along the bottom of the trench.
6. Sound the final depth of the trench at least every 20 lineal feet.

23.2 Startup and Shutdown Procedures, Bottom Cleaning

For both the SCB and ZVI portions of trench, it is necessary to maintain a "clean" trench bottom prior to backfillling.

For the SCB backfill, the methods to be employed are described in the following section. At the beginning and end of every shift of work the following procedures are employed:

1. Clean the bottom of the trench, as described above.
2. Sound the depth of the open excavation and the backfill slope.
3. Using the excavator bucket, remove large floating debris (refuse, wood, etc.) from slurry. Fill trench with slurry to maximum safe level.
4. At the beginning of the next work shift, once again sound the bottom of the trench and backfill slope and compare the two readings (morning vs. evening) to see if there are any apparent problems.
5. At start of the shift, or as necessary, re-excavate the toe of the backfill slope and draw backfill and any sediment to the excavator until the material is fresh backfill.
6. Continue excavation of the slurry trench.

For the ZVI backfill the methods to be employed are described in the following section.

1. Clean the bottom of the trench, as described above.
2. Install end stop to temporarily separate excavation and backfill operations.
3. Backfill using tremie pipe. Maximum allowable backfill drop is 5 ft. Place ZVI backfill via tremie.
4. Allow toe of backfill to build up on end stop. Monitor end stop stability.

5. Using the excavator bucket, remove large floating debris (refuse, wood, etc.) from slurry. Maintain trench full with slurry.
6. Sound the depth of the open excavation and the backfill at 20-foot intervals each shift and prior to backfilling.
7. Move end stop toward excavator to begin new backfill and excavation areas.
8. Continue excavation of the slurry trench.

23.3 Evaluation of Trench

The success of the above measures will be evaluated on a daily basis by the Slurry Trench Personnel and URS Project Manager. Trench measurements will be used to prepare a computer-generated profile of the slurry-filled trench and backfill. Any areas of obvious concern will be re-cleaned, as needed.

24.0 DISPOSITION OF EXCAVATED MATERIALS

Excavated materials are discharged along the side of the trench in a wide window about 3 feet high, at least 2 feet away from the edge of the trench. For SCB construction, these soils will be reused in the SCB backfill. For ZVI construction, these soils will be re-graded. Unsuitable soils and refuse are placed away from the suitable soils (behind the suitable soil stockpiles).

24.1 Soils Suitable for SCB Backfill

The soils most suitable for reuse in the SCB backfill are those soils that are excavated along the barrier alignment and contain a blend of clay, silt, sand, and gravel. Organic soils, visually contaminated materials, boulders, and cobbles are unsuitable for reuse. Laboratory testing has been completed to confirm the suitability and mixture proportions for all materials.

24.2 Soils Suitable for Re-Grading

Restoring the work area will involve re-grading the soil excavated from the ZVI/sand gate construction. During excavation, this soil will contain some amount of degradable guar and constituents of concern. The soil/guar mixture can be spread over the work area to allow the guar to dry and degrade. Excavated soil that may contain constituents of concern must be placed east of the PRB (upgradient). There should be no large boulders, cobbles, or refuse included in the soil/guar mixture.

24.3 Refuse and Waste

All soils are anticipated to pass the TCLP test and be considered non-hazardous. Non-hazardous soils will be disposed of on-site. Non-hazardous asphalt and other materials will be disposed of at a fully licensed local Waste Management facility.

25.0 SLURRY PREPARATION AND MAINTENANCE

The bentonite slurry, BP slurry, and cement grout are mixed in mixers. Mixing is accomplished by adding dry powder from bags to water in the mixer. With the slurries, the discharge from the mixer is directed to the storage tank for additional mixing and hydration. Circulation is maintained with a separate pump and a distribution system.

25.1 Bentonite Slurry Use

Bentonite slurry is used as an additive in the SCB backfill. Bentonite slurry is generally made by continuously mixing bentonite and water.

25.2 Biopolymer Slurry Use

Biopolymer (BP) slurry is used for supporting the trench walls and is degraded after trenching.

25.3 Degradation of BP Slurry

At the completion of each ZVI section, there will be excess BP slurry in the trench and within the pore space of the sand-iron mixture. In order to re-establish the permeability of the surrounding soils and to permit groundwater to flow through the ZVI backfill, it is necessary to breakdown the BP slurry. The breakdown of the BP slurry is accomplished by 1) breaking down the polymer slurry to simple carbohydrates (sugars), 2) encouraging native soil microbes to consume the carbohydrates, and 3) polishing.

The limited permeability of the iron-sand (compared to other materials used in trench drains such as pea gravel) usually requires multiple hours of pumping (and/or multiple pumps) to circulate the slurry and initially breakdown the slurry. The degraded slurry should show greatly reduced turbidity, but may retain some "sticky feel", which will be later consumed by natural microbes. After this point, the time for the residual slurry to be degraded could take 2-3 months.

25.4 Cement Grout

Cement grout is used to create the SCB backfill. A water/cement grout is useful for more efficient SCB mixing and hydration of the cement.

26.0 ZVI BACKFILL PREPARATION AND PLACEMENT

26.1 ZVI Proportioning

The iron/sand mixture for the permeable, reactive gates is detailed in the specifications. For quality control purposes, the proportions of iron and sand in the backfill mixture will be carefully controlled, documented, and verified using a certified weighing system.

26.2 ZVI Placement

Iron/sand will be installed in the BP trench using a tremie to establish a stable backfill slope, minimize the potential for iron/sand segregation and minimize the potential for creating "windows" in the backfill.

Backfill placed in the tremie flows into the pipe and then to the bottom of the trench. The pipe extends to near the bottom of the trench, typically, within 2 to 5 ft, limiting the drop of backfill to a maximum drop of 5 ft. The tremie will have a diameter of 6 inches.

27.0 SOIL-CEMENT-BENTONITE BACKFILL PREPARATION

27.1 SCB Design Mix

The SCB backfill is prepared in the mixing box working alongside the trench. The backfill will be composed of soil from the slurry trench excavation, bentonite slurry, clay borrow, and cement grout.

The required proportions of the soil-cement-bentonite backfill for the varius slurries are:

- Bentonite Slurry: mix water and bentonite clay (plus additives, if required),
- Cement Grout: mix water, bentonite and cement (plus additives, if required)
- SCB backfill: bentonite slurry, cement, clay borrow, and site soils (plus additives, if required).

The primary performance objectives for the SCB backfill are as follows:

- Maximum permeability: 1×10^{-6} cm/sec
- Minimum unconfined compressive strength (UCS): 30 psi

27.2 Soil Samples

A site soils sampling and investigation program was implemented during the week of April 21, 2003. Samples were obtained from the soils in the slurry wall alignment. Based on the soil borings, the soils are sands, silts, and clays. About 5 gallons of soil was collected, sealed into a 5 gallon bucket and shipped to the laboratory. Testing was performed on the soil samples to determine the correct proportions of soil, cement, and bentonite in order to achieve the desired permeability. In addition, the testing determined the need for a clay borrow material to be added to the mixture to increase the fines and decrease permeability.

27.3 Testing Standards

The following testing standards were utilized in the laboratory testing.

Materials/Mixture	Property	Standard Method	Equipment
Water	PH	API RP 13B	pH meter or tape
	Hardness	API RP 13B	Titration
Soils	Water content	ASTM D2216	Oven, scale
	Grainsize	ASTM D1140/D422	Standard sieve
Bentonite Slurry	Viscosity	API RP 13B	Marsh Funnel
	Density	API RP 13B	Mud balance
	Filtrate loss	API RP 13B	Filter press
	PH	API RP 13B	pH meter or tape
Cement Grout	Viscosity	API RP 13B	Marsh Funnel
	Density	API RP 13B	Mud balance
	PH	API RP 13B	pH meter or tape
SCB Backfill	Specimen molding	ASTM D4832	Plastic molds
	PH	API RP 13B	pH meter or tape
	Penetrometer	ASTM D1558	Pocket penetrometer
	UCS	ASTM D4832/D2166	Loading frame
	Wet Density	API RP 13B	Mud Balance
	Permeability	ASTM D5084	Triaxial cell
	Slump	ASTM C 143 (modified)	Mini slump cone (Evans, et. al. 2000)

27.4 Making Mixtures

Mixtures were created in the laboratory to simulate field mixtures. The mixtures made include bentonite-clay slurry (or slurry), composite site soils, cement grout, and soil-cement-bentonite (or SCB) backfill. Composite soils will be made from the materials obtained in the site soils investigation and sampling program.

The wet SCB mixtures will be molded into test specimens for testing after they harden, as per ASTM D4832. As the SCB hardens, penetration tests will be performed at regular intervals for the first week to measure the rate of hardening of the SCB. At 7, 14, and 28 days (or until UCS > 50 psi) after molding, the SCB will be tested for UCS. Permeability testing of the SCB will begin after at least 7 days of curing.

27.5 Protective Well Cap

Select on-site soils are used for the construction of the protective wall cap. This wall cap is intended to prevent traffic damage, and minimize desiccation of the slurry wall.

After the completion of SCB backfill material, work will commence with the protective cap. A bulldozer will first grade the area to establish a smooth base, then place 10" to 12" of loose borrow material and carefully roll to achieve compaction. This process will be repeated until the wall is completely capped and backfilled to the planned site grades.

27.6 Trench Crossings

During construction of the SCB wall, vehicles and construction equipment will only be driven over the slurry trench at approved crossing points. These crossing points will be identified and marked with barricades. All other areas of the trench will be taped off to prevent unauthorized crossing.

Crossings over the SCB wall will be constructed using a minimum 3 ft thick layer of compacted soils. If more stability is required, additional soil can be placed over the SCB backfill material or steel plates will be placed on top.

28.0 PRB SURVEY MARKERS

As part of construction of the PRBs, URS will install the survey markers that will serve as warnings regarding the location of the PRBs. PRB survey markers will be installed at the twelve- (12) locations depicted on the Construction Drawings. The markers will contain the wording found in the specifications. The URS Project Manager, prior to installation, will determine the final wording and dimensions.

29.0 SITE RESTORATION

After the trench is backfilled, the site is cleaned up to permit subsequent activities and to cover and protect the PRB. These activities include placing the compacted trench cover, spreading excess backfill and soil materials, and wasting excess slurry. Any excess materials will be managed per Section 24.3 Refuse and Waste. Site restoration will be performed, including placement of topsoil, seeding, supplements, and erosion control blanket. Refer to the specifications for requirements regarding topsoil, seeding, supplements, and erosion control blanket.

30.0 PROJECT CLOSEOUT

Project closeout will consist of cleaning the project site, inspection, and provisions for substantial completion and final acceptance. Waste is removed such as excess construction material, wood, concrete, debris, and any other foreign material. Also, all temporary utilities to the site are disconnected and temporary site facilities, utilities, constructed temporary access roads and parking areas are removed and/or restored. Disturbed ground is restored and repairs are made to fencing, monitoring wells, control points, and signs. Refer to project specifications for requirements regarding required project closeout documentation.

31.0 PROJECT RECORD DOCUMENTS

Record Documents will be maintained in a clean, dry, and legible condition and will not be used for construction purposes. Record Documents and samples will be made available for inspection by the URS Project Manager, Project Owner and the State. A Construction Documentation Report, stamped by a licensed New York Professional Engineer, will be submitted after completion of the project. Refer to project specifications for additional requirements regarding required project closeout documentation.

The site will maintain one record copy of the construction schedule and progress record, Construction Drawings and Technical Specifications, addendum and modifications, Construction Quality Control Plan, Site Health and Safety Plan, change orders, request for information/clarification, and other modifications to the contract. Documents will also include records of tests and measurements conducted in accordance with the CQCP and CQAP and manufacturer's certificates.

In addition, the site will maintain daily work activity reports, including reports on any emergency response actions, records of all site work, equipment usage, water usage, labor hours, truck load tickets and shipping papers, laboratory test results, nonconformance reports, waste characterization, manifests, disposal records, and survey records. Forms required for completion are included Appendix E.

Appendix A

Quality Control/Quality Assurance

Table 1: Summary of QA/QC Activities for PRB Funnel and Gate System

Former Miller Container Site, Fulton NY

CQA/CQC Program and Testing Specification Iron/Sand Permeable Barrier Segments

	Frequency	Approx. No. of QC Samples	Approx. No. of QA Samples	Activity	Acceptance Criteria	QC Performed By	QC Confirmed By (QA Performed By)
Trench Excavation Testing							
Trench Width and Continuity	Continuous	19	2	Bucket pass through trench (measure bucket width)	Min. 2 ft width	Const. QC Personnel	Field Engr.
Trench Verticality	1 per shift	18	2	Measure level across tracks of excavator			
Trench Sounding - Backfill Slope	End of day; Beginning of following day at 20 ft intervals	36	4	Measure depth/slope	Minimal change, or implement corrective measures.	Const. QC Personnel	Field Engr.
Trench Sounding - Depth	Every 20 ft.	19	2	Measure depth	3 ft Key into till or refusal		
Trench Bottom Cleaning	As Required	19	2	Bucket pass through trench	Clear bottom of debris	Const. QC Personnel	Field Engr.
Trench Key Confirmation	Every 20 ft.	19	2	Visual Inspection of cuttings and sounding top/bottom	Measure to top till and to bottom of trench	Const. QC Personnel	Field Engr.
Fresh BP Slurry Testing							
Fresh Slurry Viscosity Testing	2 per shift	36	4	Test slurry in Marsh Funnel	> 60 seconds	Const. QC Personnel	Field Engr./Lab
Fresh Slurry pH Testing	2 per shift	36	4	Colorametric strips	≥9	Const. QC Personnel	Field Engr./Lab
Trench BP Slurry Testing							
Trench Slurry Viscosity Testing	4 per shift	72	7	Test slurry in Marsh Funnel	> 50 seconds	Const. QC Personnel	Field Engr./Lab
Trench Slurry pH Testing	4 per shift	72	7	Colorametric strips	≥ 8	Const. QC Personnel	Field Engr./Lab
Iron/Sand Testing							
Mixing	Continuous	18	2	Maintain mix time	100 revs or 5 min.	Const. QC Personnel	Field Engr.
Iron Content/Magnetic Separation Testing	3 samples from first 2 mixer loads: first material out of mixer, mid-way through unload, end of unload	6	1	Measure weight of sand and iron (obtain from subcontractor)	> 29% or more by wt.	Const. QC Personnel	Field Engr.
	2 per shift after first two mixer loads	36	4	Measure weight of sand and iron (obtain from subcontractor)	> 29% or more by wt.	Const. QC Personnel	Field Engr.
Water Content	Continuous	19	2	Monitor water added to Fe/Sand	as required to discharge trucks		
Fe/Sand Density	1 per shift	18	2	Measure density	Monitor		
Sand Gradation Testing	Pre-Construction	1	N/A	Obtain from vendor before start	Per specifications		
Iron Gradation Testing	Pre-Construction	1	N/A	Obtain from vendor before start	Per specifications		
Backfill Mixing/Placement by Tremmie	Every 20 ft.	19	2	Monitor/maintain equipment/process	Controlled mix/placement	Const. QC Personnel	Field Engr.
Degradation of BP Slurry							
pH of the Slurry	2 per shift	10	1	Test in-trench slurry pH prior to adding enzyme breaker	pH 6 to 9 units	Const. QC Personnel	Field Engr.
Slurry Testing	As Required	5	1	Test slurry in Marsh Funnel	<30 seconds indicates slurry is broken	Const. QC Personnel	Field Engr.
Enzyme Breaker Quantity Added	After enzyme breaker is added to each well	5	1	Record volume recirculated; Record amount of enzyme added per recirculation well	Recirculate a minimum of 2 pore volumes	Const. QC Personnel	Field Engr.
Final Alignment Survey							
Survey Markers	After installation	N/A	N/A	Place and survey monuments	Surveyed and monumented per specs	Subcontractor	Field Engr.

Performance Monitoring

	Frequency			Activity	Acceptance Criteria	QC Performed By	QC Confirmed By (QA Performed By)
Groundwater Monitoring							
	Per PBMP			Collect and analyze GW samples, measure GW elevations	Target constituents achieve treatment criteria, flow through gates and not over/under gates/funnels	Subcontractor	Field Engr./Lab

Note:

All activities to be documented daily and maintained on-site in field trailer (during const. activities)
See Construction Specification Document
Field Engineer will collect sample splits where appropriate and submit to an independent lab for analysis for perm, gradation, viscosity, density and mag sep testing
Field Engineer will independently verify and document construction verification activities

Table 1: Summary of QA/QC Activities for PRB Funnel and Gate System

Former Miller Container Site, Fulton NY

CQA/CQC Program and Testing Specification SCB Slurry Wall Segments

	Frequency	Approx. No. of QC Samples	Approx. No. of QA Samples	Activity	Acceptance Criteria	QC Performed By	QC Confirmed By (QA Performed By)
Trench Excavation Testing							
Trench Width and Continuity	Continuous	23	2	Bucket pass through trench (measure bucket width)	Min. 2 ft width	Const. QC Personnel	Field Engr.
Trench Verticality	1 per shift	12	1	Measure level across tracks of excavator			
Trench Sounding - Backfill Slope	End of day; Beginning of following day at 20 ft intervals	24	2	Measure depth/slope	Minimal change, or implement corrective measures.	Const. QC Personnel	Field Engr.
Trench Sounding - Depth	Every 20 ft.	23	2	Measure depth	3 ft Key into till or refusal		
Trench Bottom Cleaning	As Required	23	2	Bucket pass through trench	Clear bottom of debris	Const. QC Personnel	Field Engr.
Trench Key Confirmation	Every 20 ft.	23	2	Visual Inspection of cuttings and sounding top/bottom	Measure to top till and to bottom of trench	Const. QC Personnel	Field Engr.
Fresh Slurry Testing							
Fresh Slurry Viscosity Testing	2 per shift	24	2	Test slurry in Marsh Funnel	40+ seconds	Const. QC Personnel	Field Engr./Lab
Fresh Slurry pH	1 per truck load	68	7	colorametric strips	≥ 7		
Fresh Slurry Density Testing	2 per shift	24	2	See ASTM	Min. 64 pcf	Const. QC Personnel	Field Engr./Lab
Fresh Slurry Filtrate Loss	1 per truck load	68	7	See ASTM	Max. 25 mL	Const. QC Personnel	Field Engr./Lab
Trench Slurry Testing							
Trench Slurry Viscosity Testing	2 per shift	24	2	See ASTM	Passes funnel	Const. QC Personnel	Field Engr./Lab
Trench Slurry pH	1 per shift or as required	12	1	colorametric strips	monitor for cement contamination		
Trench Slurry Density Testing	2 per shift	24	2	See ASTM	64 to 90 pcf	Const. QC Personnel	Field Engr./Lab
Cement Grout Testing							
Grout Density	2 per shift	24	2	ASTM	TBD in Lab testing		
Cement Content	1 per shift	12	1	Monitor cement addition	TBD in Lab testing		
Backfill Testing							
Backfill Slump Testing	1 per shift, more to start	15	2	Measure slump	5" to 7"	Const. QC Personnel	Field Engr.
Mold SCB Samples	6 per shift	72	7	Make Samples	ASTM D4832		
Hardened SCB Strength	1 per shift	12	1	UCS or Penetrometer	TBD in Lab testing		
Backfill Gradation Testing	1/600cy	4	1	Measure gradation	TBD in Lab testing	Const. QC Personnel	Field Engr./Lab
Hardened SCB Permeability	1/600cy	4	1	Flex Wall Perm Test	< 1 x 10-6 cm/sec	Off Site Lab	Field Engr./Lab
Backfill Mixing/Placement	Continuous	23	2	Monitor/maintain equipment/process	homogeneous	Const. QC Personnel	Field Engr.
Final Alignment Survey							
Survey Markers	After installation	N/A	N/A	Place and survey monuments	Surveyed and monumented per specs	Subcontractor	Field Engr.

Note:

All activities to be documented daily and maintained on-site in field trailer (during const. activities)
See Construction Specification Document
Field Engineer will collect sample splits where appropriate and submit to an independent lab for analysis for perm, gradation, viscosity, density and mag sep testing
Field Engineer will independently verify and document construction verification activities

PROJECT NAME
PROJECT NAME
PROJECT LOCATION

BACKFILL SLOPE

PERMEABLE TREATMENT WALL PANEL NO.: ____________ BACKFILL TYPE : ____________

DAILY QC RESULTS TECHNICAL SPECIFICATION: ________________________

DATE: ____________ SHIFT NO. ____________ INSPECTOR: ________________________

Geo-Solutions

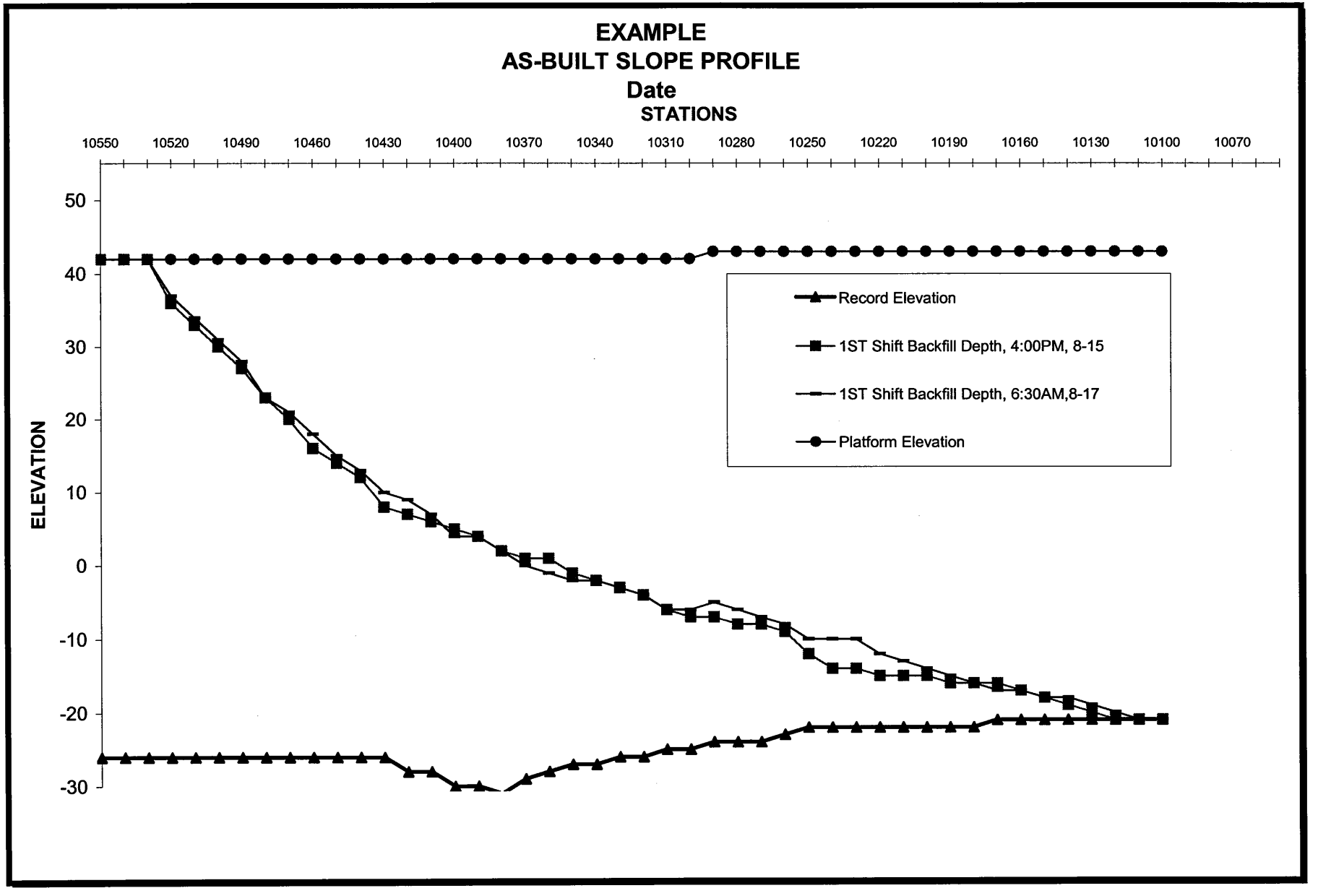
BACKFILL SLOPE MEASUREMENTS (Every 20 lf, twice daily)

STATION NO. LF.	RECORD TRENCH BOTTOM ELEV.	TIME: DATE: PM BACKFILL ELEV.	TIME: DATE: AM BACKFILL ELEV.	WORK PLATFORM ELEV.	RECORD TRENCH DEPTH FT.	TIME: DATE: PM BACKFILL DEPTH	TIME: DATE: AM BACKFILL DEPTH

COMMENTS:

SIGNED: ________________________
Contractor's QC Supervisor

SIGNED: ________________________
Owner's Representative


EXAMPLE
AS-BUILT SLOPE PROFILE
Date
STATIONS
10550
10520
10490
10460
10430
10400
10370
10340
10310
10280
10250
10220
10190
10160
10130
10100
10070
50
40
30
20
10
0
-10
-20
-30
ELEVATION
Record Elevation
1ST Shift Backfill Depth, 4:00PM, 8-15
1ST Shift Backfill Depth, 6:30AM,8-17
Platform Elevation

PROJECT NAME _____

PROJECT NAME _____

PROJECT LOCATION _____

SLURRY EXCAVATION

PERMEABLE TREATMENT WALL PANEL NO.: _____ BACKFILL TYPE: _____

DAILY QC RESULTS TECHNICAL SPECIFICATION: _____

DATE: _____ SHIFT NO. _____ INSPECTOR: _____

Geo-Solutions

KEY: _____ (refusal or minimum 4 feet) BUCKET WIDTH: _____ (minimum _____ inches) SLURRY LEVEL: _____ (>3ft above GWT*, w/in 2ft of Platform)

MEASURE EXCAVATION PRIOR TO BACKFILLING (Every 20 lf)

DATE	STATION NO.	DEPTH TO TOP OF KEY FORMATION Ft.	DEPTH IN KEY Ft.	FINAL RECORD DEPTH FROM PLATFORM Ft.	PANEL LENGTH Ft.	PANEL AREA EXCAVATED SF	COMMENTS
						SQ FT TODAY	
						SQ FT TODATE	

COMMENTS: _____

SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

PROJECT NAME _____

PROJECT NAME _____

PROJECT LOCATION _____

IRON / SAND BACKFILL

PERMEABLE TREATMENT WALL

DAILY QC RESULTS TECHNICAL SPECIFICATION: _____

DATE: _____ SHIFT NO. _____ INSPECTOR: _____

Geo-Solutions

IRON/SAND BACKFILL

MIXTURE TRACKING

TRUCK NO.	TIME LOADED	TIME DISCHARGED	IRON (LBS)	SAND (LBS)	WATER ADDED (GALS)	PANEL BFILLED	COMMENTS (mixing time, wells placed, etc.)
Spec:	Less than 8 hrs.		> 20%	< 80%			

TEST RESULTS

TRUCK NO.	TIME	SAMPLE NO.	IRON (%)	SAND (%)	WATER (%)	DENSITY (PCF)	COMMENTS (slump, temp, etc.)

COMMENTS:

SIGNED: _____ SIGNED: _____

Contractor's QC Supervisor Owner's Representative

PROJECT NAME _____

PROJECT NAME _____

PROJECT LOCATION _____

FRESH POLYMER SLURRY

Bio-Polymer Slurry Trench

DAILY QC RESULTS TECHNICAL SPECIFICATION: _____

DATE: _____ SHIFT NO. _____ INSPECTOR: _____

Geo-Solutions

TEST FRESH POLYMER SLURRY

VISCOSITY: (2 per shift) (> 60 seconds)

Time:	Result:

DENSITY: (2 per shift) (>63 pcf)

Time:	Result:

pH: (2 per shift) (>8 units)

Time:	Result:

Number Bags Mixed This Date for Slurry: _____

Weight Per Bag: _____

COMMENTS:

_____

_____

_____

_____

_____

_____

_____

_____

SIGNED: _____ SIGNED: _____

Contractor's QC Supervisor Owner's Representative

PROJECT NAME _____

PROJECT NAME _____

PROJECT LOCATION _____

TRENCH
POLYMER SLURRY

BIO-POLYMER SLURRY TRENCH

DAILY QC RESULTS TECHNICAL SPECIFICATION: _____

DATE: _____ SHIFT NO. _____ INSPECTOR: _____

Geo-Solutions

TIME	STA (ft)	DEPTH (ft)	VISCOSITY (MF sec)	pH (units)	Observations

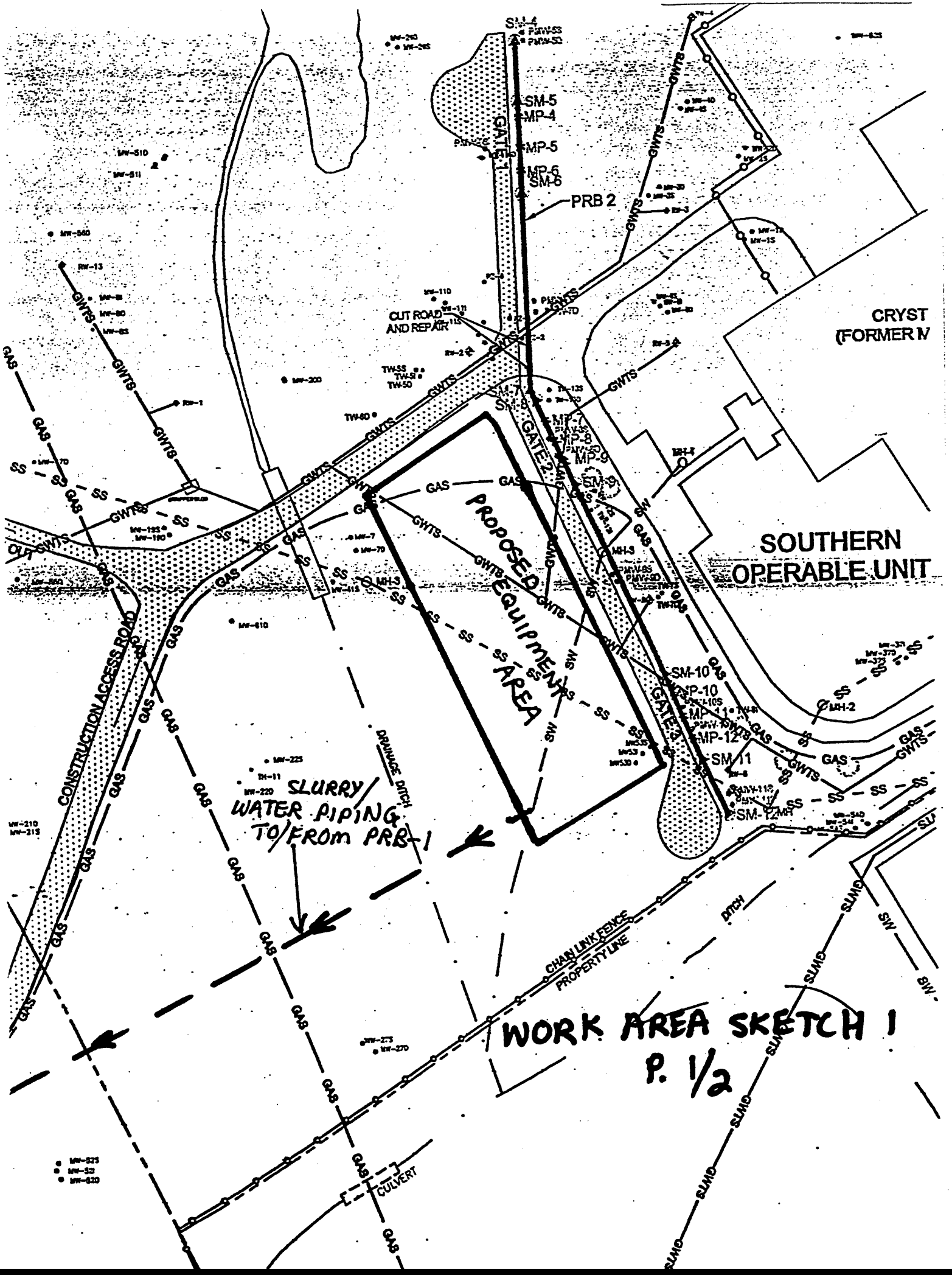
COMMENTS: _____

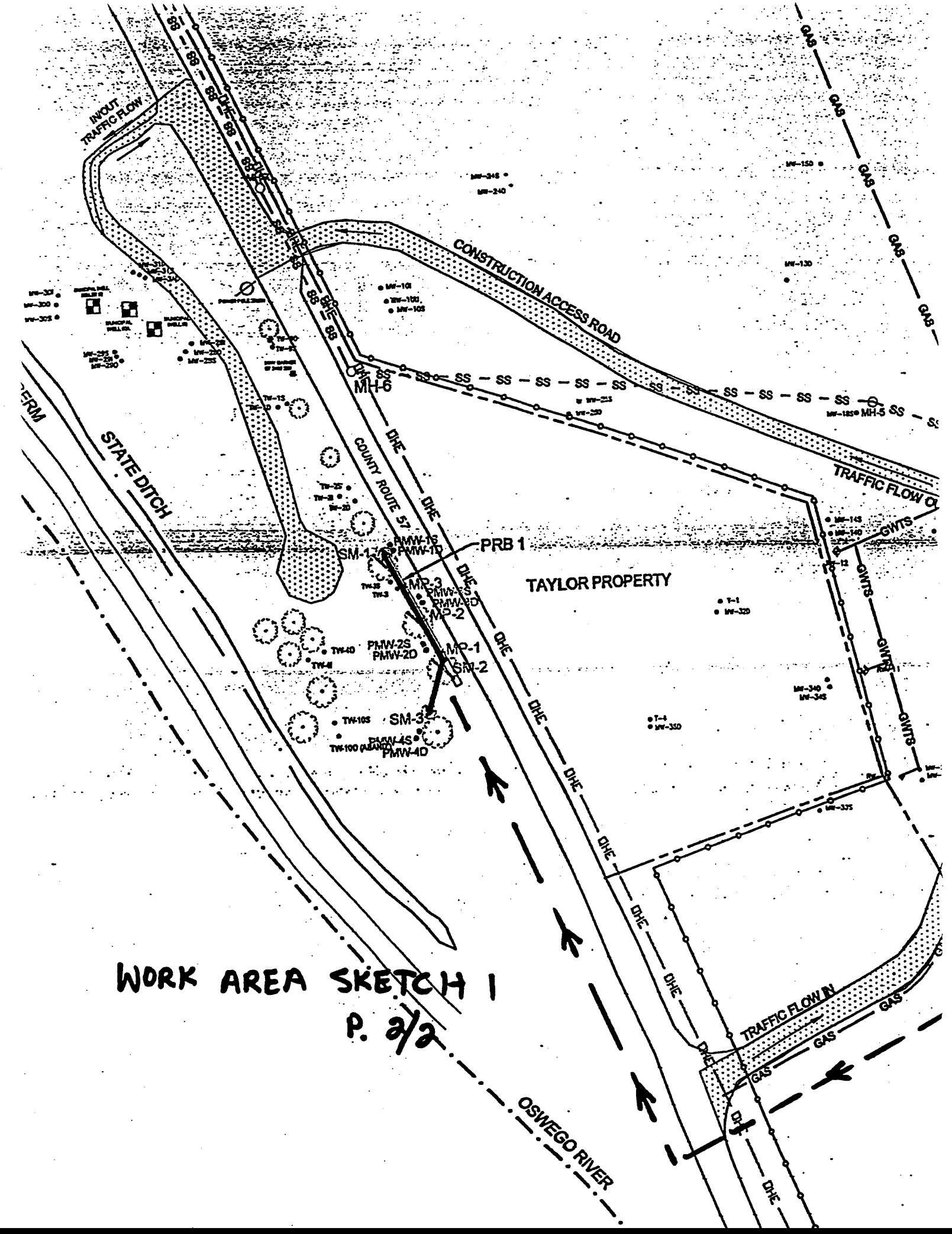
SIGNED: _____
Contractor's QC Supervisor

SIGNED: _____
Owner's Representative

Appendix B

Work Area Sketches


SM-4
SM-5
MP-4
MP-5
MP-6
SM-6
GATE 1
PRB 2
CUT ROAD AND REPAIR
CRYST
(FORMER N
SM-7
SM-8
MP-7
MP-8
MP-9
SM-9
GATE 2
PROPOSED EQUIPMENT AREA
SOUTHERN OPERABLE UNIT
SM-10
MP-10
MP-11
MP-12
SM-11
SM-12
GATE 3
CONSTRUCTION ACCESS ROAD
DRAINAGE DITCH
SLURRY WATER PIPING TO/FROM PRB-1
CHAIN LINK FENCE PROPERTY LINE
DITCH
CULVERT
WORK AREA SKETCH 1
P. 1/2

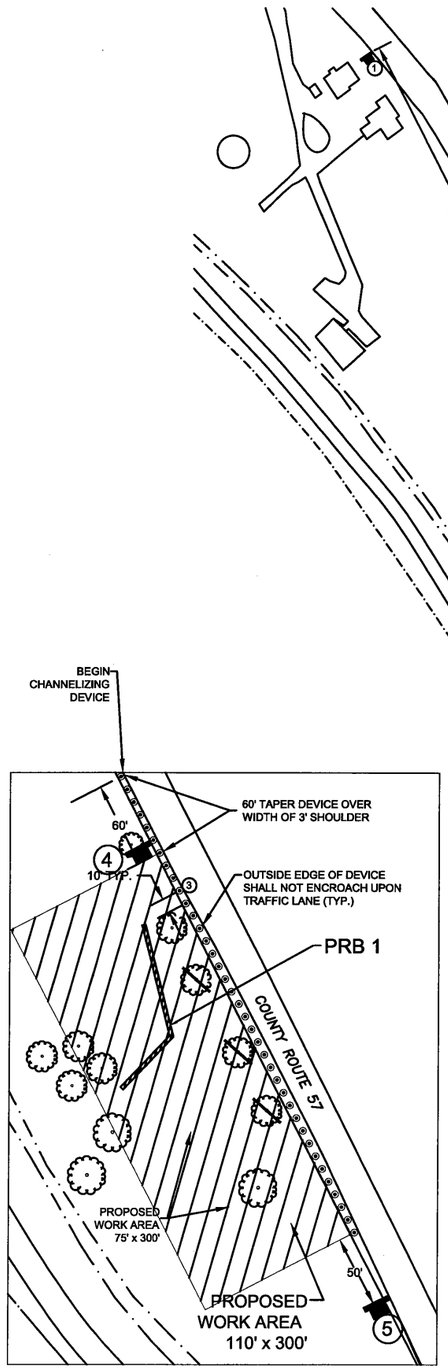


WORK AREA SKETCH 1

P. 2/2

Appendix C

Traffic Control Plan



PROPOSED WORK AREA DETAIL

0 50 100
SCALE IN FEET

0 100 200
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE DITCH
- PROPOSED DESIGNATED PATH FOR CONSTRUCTION VEHICLE ACCESS
- CHAIN LINK FENCE
- PROPOSED TREE REMOVAL AND REPLACEMENT
- PROPOSED PERMEABLE REACTIVE BARRIER FUNNEL
- PROPOSED PERMEABLE REACTIVE BARRIER GATE

TRAFFIC CONTROL SYMBOLS KEY

1	W8-1D 48"x48"
2	W8-2D 36"x36"
3	C5-1 DRUMS
4	C3-2 WING BARRICADE WITH FLAG TREE
5	G11-2C 36"x24"

NOTE:

1. TRAFFIC CONTROL PLAN FOR PRB-1 WORK AREA IN ACCORDANCE WITH STATE OF NEW YORK CODES, RULES AND REGULATIONS (NYCRR) GOVERNING TRAFFIC CONTROL DEVICES.

SEAL

PREPARED FOR
MILLER BREWING COMPANY
FORMER CONTAINER PLANT
VOLNEY, NEW YORK

SCALE	AS SHOWN	
DESIGNED BY	MB	DATE 7/17/03
DRAWN BY	RF	DATE 7/17/03
CHECKED BY		DATE
APPROVED BY		DATE

URS
MILWAUKEE, WISCONSIN 53228

DRAWING FILE
TRAFFIC CONTROL PLAN
CAD FILE PATH MILLER\PRB DESIGN\REVISED\DELIVERABLES\C-10

CONTRACT NO.	DRAWING NO.	REV NO.
81002401	C-10	1

Appendix D

Erosion Control Plan

Erosion Control Plan for Permeable Reactive Barrier Installation

Former Miller Container Plant
Volney, NY

Prepared for:

Miller Brewing Company
Milwaukee, WI

Prepared by:

URS
Milwaukee, WI

September 2003

1.0 Project Description

The Former Miller Brewing Container Plant (currently Crysteel Manufacturing Facility) is located at 1902 County Route 57, Fulton, New York. The facility is located approximately 1200 feet south of the City of Fulton, New York and approximately 1000 feet northeast of the Oswego River.

The activities covered by this plan include construction of two zero-valent iron permeable reactive barriers. Construction of the PRBs will involve excavation of one trench each for PRB-1 and PRB-2. The trench associated with PRB-1 will be approximately 2-feet wide, 130 feet long, and 30-60 feet deep. The trench for PRB-2 will be approximately 2 feet wide, 700 feet long, and 60-75 feet deep. The trenches will be filled with a biopolymer slurry during construction, which will provide a means to keep the excavation open during installation of the PRB media.

The work associated with these activities includes, but is not limited to:

Zero-Valent Iron PRB Construction:

1. Site preparation;
2. Delivery of granular iron (and other construction materials, as applicable);
3. Installation of the PRBs, Performance Monitoring Wells, Maintenance Points, and Survey Markers;
4. Management of excavated spoils and groundwater (as applicable);
5. Verification of PRB installation;
6. Site Restoration including final grading; and
7. Work incidental to the above work items.

Well Installation:

1. Installation of new monitoring wells;
2. Installation of new Maintenance Points; and
3. Site restoration.

2.0 Project Size

The project is generally divided into two separate working areas for PRB-1 and PRB-2. The work area for PRB-1 will consist of a temporary gravel access road leading to the trench and the work area directly surrounding the trench. The total area affected by PRB-1 construction is approximately 0.7 acres. The work area for PRB-2 will consist of a temporary gravel access road installed the length of the trench and the work area directly surrounding the trench. The total area affected by PRB-2 construction is approximately 2.75 acres. The central staging location will be a field construction trailer with a gravel laydown area approximately 50 feet by 20 feet (0.023 acres).

3.0 Improvements

The existing access road to the Crysteel Manufacturing Facility will be cut in one location in order to allow excavation of the trench. After completion of the construction activities, the road will be repaired with a subgrade of stone followed by installation of flexible pavement (asphalt). No new acreage will be paved or otherwise made less permeable as a result of this construction. All areas will be restored to pre-construction surface types.

4.0 Location Map and Site Layout

Appendix A includes figures as drawings that depict the site location (C-1) and site layout (C-2, C-3).

5.0 Site Characteristics

The slope at the site in the locations of construction is relatively flat. The slope in the area of PRB-1 is generally between 10H: 1V and 12H: 1V. The slope in the area of PRB-2 is generally between 25H: 1V and 33H: 1V. Slopes in the areas of work are less then 3H:1V so there is no need for immediate slope stabilization. The seasonal high depth to groundwater is approximately 15 feet below ground surface. The depth to bedrock varies at PRB-1 and PRB-2. At PRB-1, the bedrock is between 40-60 feet below ground surface. At PRB-2, the bedrock is between 60-80 feet below ground surface.

6.0 Purpose of Plan

The purpose of this erosion control plan is to provide direction to prevent silting and muddying of lakes, ponds, wetlands, and any rivers or tributary streams of creeks that may lie in close proximity to the proposed construction.

The specific erosion control features outlined in this document are shown on the Construction Drawings included in the specifications for the project. The features outlined are intended to fulfill regulatory requirements for erosion control, if applicable. This plan is consistent with Section 02370 – Erosion and Sediment Control of the design specifications, and any additional requirements in this section shall be followed.

No change in pre- and post-construction runoff is anticipated.

7.0 Erosion Control Features

There are existing erosion control features on-site. Existing features include a sedimentation pond, grass covered drainage channels, and vegetated ground surfaces. No flow has been observed in the drainage channel in the area of construction activity. It appears the pond may discharge to a drainage channel to the east of the pond. This channel is not in the area of proposed construction activity.

Erosion control will rely on vegetative cover in the drainage channels and ground surface, and the pond, in conjunction with proposed erosion control features.

Areas of exposed erodible soil in the coarse of earthwork operations will be shaped to permit storm runoff with minimum erosion. Temporary berms, slope drains, diversion mounds and sedimentation basins will be installed where possibilities for water pollution exist and permanent controls are not completed or operative. Temporary soil stockpiles will be covered with 8-10 mil plastic to prevent erosion from wind and rain.

Silt fences will be installed as perimeter sediment control to prevent sediment from entering wetlands, drainage ditches, or open water. The temporary construction access road base will be underlain with a woven stabilization geotextile. It shall provide stabilization and reinforcement when heavy loads are expected. The temporary construction access road will also provide a means to prevent tracking dirt off-site.

After topsoil and seed placement, an erosion control reinforcement blanket (ECRB) will be installed. The ECRB will consist of biodegradable matting comprising straw, jute, coconut, excelsior, or other natural material that may be reinforced with polypropylene or other polymer netting as approved. ECRB will maintain its integrity until acceptable vegetation layer is established. Manufacturer's product data sheets for the silt fence and ECRB are included in Appendix B.

8.0 Schedule

Mobilization to the project site is anticipated to begin September 15, 2003 with construction commencing soon afterward. The duration of on-site activities is anticipated to be less than 10 weeks. Anticipated completion date is April 15, 2004.

9.0 Existing Conditions

The drawings included as part of this Plan depict the existing contours on the site. The contours are based on elevations derived from a survey of existing wells and surrounding elevations. The drawings also depict the existing drainage ditches, pond, culverts, and the location of the Oswego River with respect to the construction activities.

The land use in the area is mostly open green space covered by grass, trees, and miscellaneous shrubs. The topsoil is underlain by fill material (sand, gravel, clay silt) and silty clay. There is a municipal well field in the area of PRB-1. The existing utilities (gas, sanitary, storm, and water) are also shown on the drawings. Vehicle access to the Crysteel Manufacturing Facility is via a private plant access road for entrance and exit. Access is from County Highway 57.

Property boundaries, based on available documents, are shown on the drawings.

10.0 Hydrologic Data

	March	April	May	June	Annual
Normal Monthly Precip (in)	3.02	3.39	3.39	3.71	40.05
Normal Daily Mean Temp (F)	33.6	45.3	57.1	65.8	47.4
Normal Daily Max Temp (F)	43.1	55.7	68.5	77.0	57.1
Normal Daily Min Temp (F)	24.2	34.9	45.8	54.6	37.7
Mean # Days w/ Precip 0.01 inch or more	17	14	13	11	171
Mean # Days w/Min Temp 32F or Less	24	12	1	0	135

1-Year 24-Hour Rainfall	2.2 Inches
2-Year 24-Hour Rainfall	2.3 Inches
10-Year 24-Hour Rainfall	3.6 Inches
100-Year 24-Hour Rainfall	4.8 Inches

11.0 Proposed Conditions

The completed project will not present additional impervious area by the creation of buildings, streets, or other paved areas. During the course of construction, some utilities may be temporarily relocated but will be returned to pre-existing condition after construction.

Soil excavated from the trench and not returned to the trench after construction will be spread upgradient of the PRBs. The soil will be approximately 1 foot in depth and will be overlain by approximately 6" of topsoil. This will raise the contour elevations from the existing condition. However, the area affected by the change in elevation represents between 0.4 and 0.7 acres compared to the entire site property of over 40 acres.

All disturbed areas will be overlain by approximately 6" of topsoil, seeded, and covered with an erosion control blanket according to the manufacturer's recommendations. Supplements may be added to the soil to assist with germination and growth of the seed.

12.0 Temporary Erosion and Sediment Control

URS will, furnish, install, and maintain all temporary erosion and sediment control measures during the course of construction. Every effort will be made to minimize erosion from site clearing, excavation, and earth fill operations in the areas of the site work. Special care will be taken to maintain all existing vegetation outside the work area limits. Manufacturer data sheets for the silt fence and stabilization geotextile specified are contained in Appendix B. Specifications for topsoil are contained in Section 02700 - Topsoil of the design specifications.

Erosion and sediment control measures will be installed before any intrusive construction work (clearing and grubbing, demolition, decommissioning, excavation, etc.) is started. Temporary erosion and sediment control measures will be in accordance with the following:

1. The area of bare soil exposed at any given time shall be restricted to a minimum.

2. Temporary erosion and sediment control measures, such as grading, silt fences, or straw bales shall be provided and maintained until the permanent work is completed and operative.

Temporary erosion and sediment control measures include a gravel construction entrance and road, installing silt fences around the low side of sloping areas, covering soil stockpiles, protecting material storage and staging areas, and building berms near the excavation to catch potential spills.

A stabilization geotextile will be installed under the gravel construction entrance and road in order to reduce the impact on the underlying soil and minimize erosion around the roadway.

Once the work is completed and permanent measures are in place, most temporary erosion and sediment control measures will be removed. Temporary berms and soil stockpiles will be distributed at the site and covered with topsoil. The temporary access road will remain in place and be covered with clean fill and topsoil as necessary to match grade. The silt fence will remain in place until the permanent erosion control measures are installed.

13.0 Permanent Erosion and Sediment Control

All areas disturbed during construction activities will be seeded, stabilized with straw mulch and tackifier, fertilized and watered to establish vegetation. Specifications for seeding are contained in Section 02750 - Seeding and Soil Supplements of the design specifications.

The topsoil will consist of clean soil material spread to a thickness of 6" above existing grade. The topsoil may not include rock fragments that are greater than 2-inches in diameter. The topsoil will support quick germination and fast-growing vegetation capable of stabilizing the soil surface from erosion.

Fertilizers will be selected to supplement nutrient levels in the topsoil. Topsoil samples will be submitted for analysis at the approved lab to determine the necessary fertilizer and liming requirements. The final cover seed mixture for permanent vegetation shall be clean, high in germinating value and mixed as follows:

Name	Proportion by Weight
Kentucky Bluegrass	80%
Perennial Ryegrass	20%

The final surface will be approved by the Engineer and the Project Owner prior to seeding. If damage occurs during seeding operations, the surface will be restored to the original condition.

An erosion control reinforcement blanket will be installed in areas disturbed by construction of the treatment walls in accordance with approved manufacturer recommended procedures. The ECRB will be installed in other disturbed areas where slopes exceed 2 percent to protect adjacent waterways and to limit wind erosion at the discretion of the Engineer. The ECRB will be anchored and secured with pins, staples, stakes, or other devices as recommended by the manufacturer. A manufacturer's product data sheet for the ECRB is included in Appendix B.

14.0 Implementation and Maintenance Schedule

Erosion and sediment control operations will be conducted in conformance with the Construction Documents. Erosion and sediment control procedures will comply with the substantive requirements of applicable federal, state, and local laws and regulations and required permits concerning erosion and sediment control.

The general sequence for implementation and maintenance of the erosion control measures is as follows:

1. Install silt fence at specified locations.
2. Strip topsoil from access road and construction areas and stockpile. Cover stockpile.
3. Install road stabilization geotextile with access road and temporary laydown area.
4. Perform construction activities and construct temporary berms around storage areas and excavation work areas.
5. Maintain all sediment and erosion controls during the installation of the PRBs. Inspect all controls on a daily basis. Perform maintenance and/or install new erosion control measures, as required, during construction to ensure that sediment does not breach measures. Accumulated sediment will be removed when 30% of the storage capacity of the silt fence is filled with sediment.
6. Spread spoils upgradient of PRBs. Place random fill over temporary access roads.
7. Perform finish grading after soil is distributed.
8. Install permanent vegetation and landscaping. Seeding and mulch will be installed within 15-days of final grading.
9. Remove sediment and erosion control measures after all disturbed areas are permanently stabilized.

When preparing to install the geotextiles, the rolls will be examined upon delivery, and any deviation from the Specifications and the submitted certifications be reported to the Engineer. Unroll the geotextile loosely across the prepared subgrade in a manner that will allow the geotextile to conform to surface irregularities. The geotextile must not be stretched during placement. The geotextile (including overlaps) should be secured in place using staples supplied by the manufacturer. Staple location and spacing will be such that there is no displacement of geotextile during the placement of cover materials. Geotextile roll wrappings must not be removed more than 24 hours before placement.

Longitudinal geotextile overlaps will be a minimum of one (1) foot and end of roll laps shall be a minimum of two (2) feet. Seams should be oriented down slopes perpendicular to grading contours unless otherwise specified. All laps will be made with the uphill geotextile panel on top of the adjacent downhill geotextile panel.

Topsoil must not be placed in frozen or muddy conditions. The topsoil will be placed over all areas shown on the Construction Drawings including, but not limited to:

1. Temporary access roads;
2. Areas requiring repair due to site activities; and
3. To provide cover for areas where trench spoils will be graded on-site.

An evenly finished surface will be provided where new site elevations will blend with undisturbed, existing site elevations to maintain the general pattern of surface runoff prior to construction activities.

Following topsoil placement, fertilizer, seed and mulch will be applied at the application rates defined in the specifications. Grass seed will be applied by hydroseeding or other method approved by the Engineer. Seed will not be sowed during high winds or when the ground surface is too wet for working. Seed will be spread at a rate of 250 lb./acre. Any portions of the seeded areas, which do not produce a minimum 70 percent groundcover, will be re-fertilized, re-seeded and re-watered until vegetation is established.

Straw mulch and tackifier will be placed within one (1) day of seeding. Straw mulch will be spread at a rate of 2 ton/acre for normal seeding and 3 ton/acre for dormant seeding. Tackifier will be spread according to manufacturer's instructions.

The Engineer will inspect all seed prior to commencement of seeding operations. The Engineer should be notified at least 48 hours in advance of all planned seeding operations and specific materials and their locations should be identified. Seeding operations will only be carried out between April 15th – June 15th and September 10th - October 10th, unless otherwise approved by the Engineer in consultation with the New York State Department of Environmental Conservation.

Appendix A
Site Location and Layout

PERMEABLE REACTIVE BARRIER DESIGN

FOR

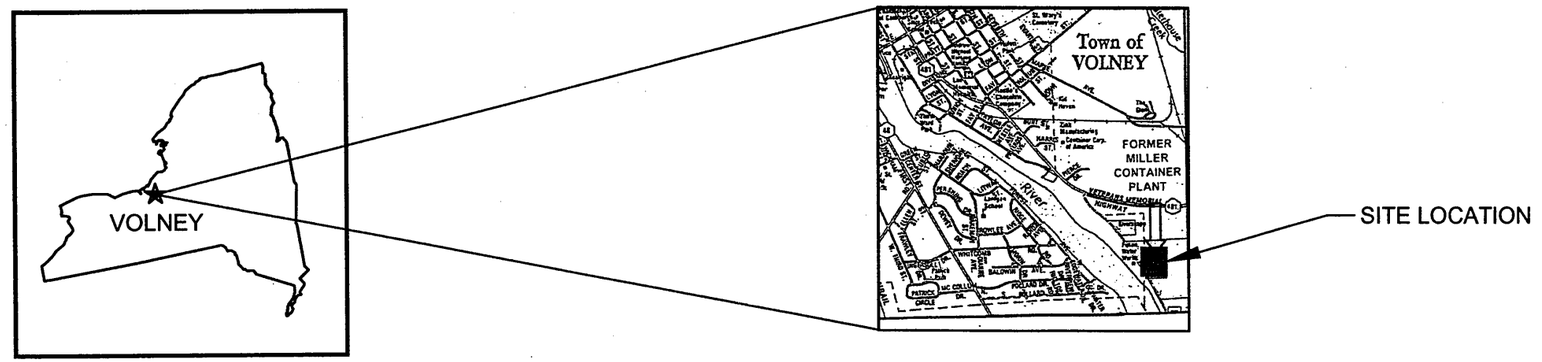
MILLER BREWING COMPANY

FORMER MILLER CONTAINER PLANT

VOLNEY, NEW YORK

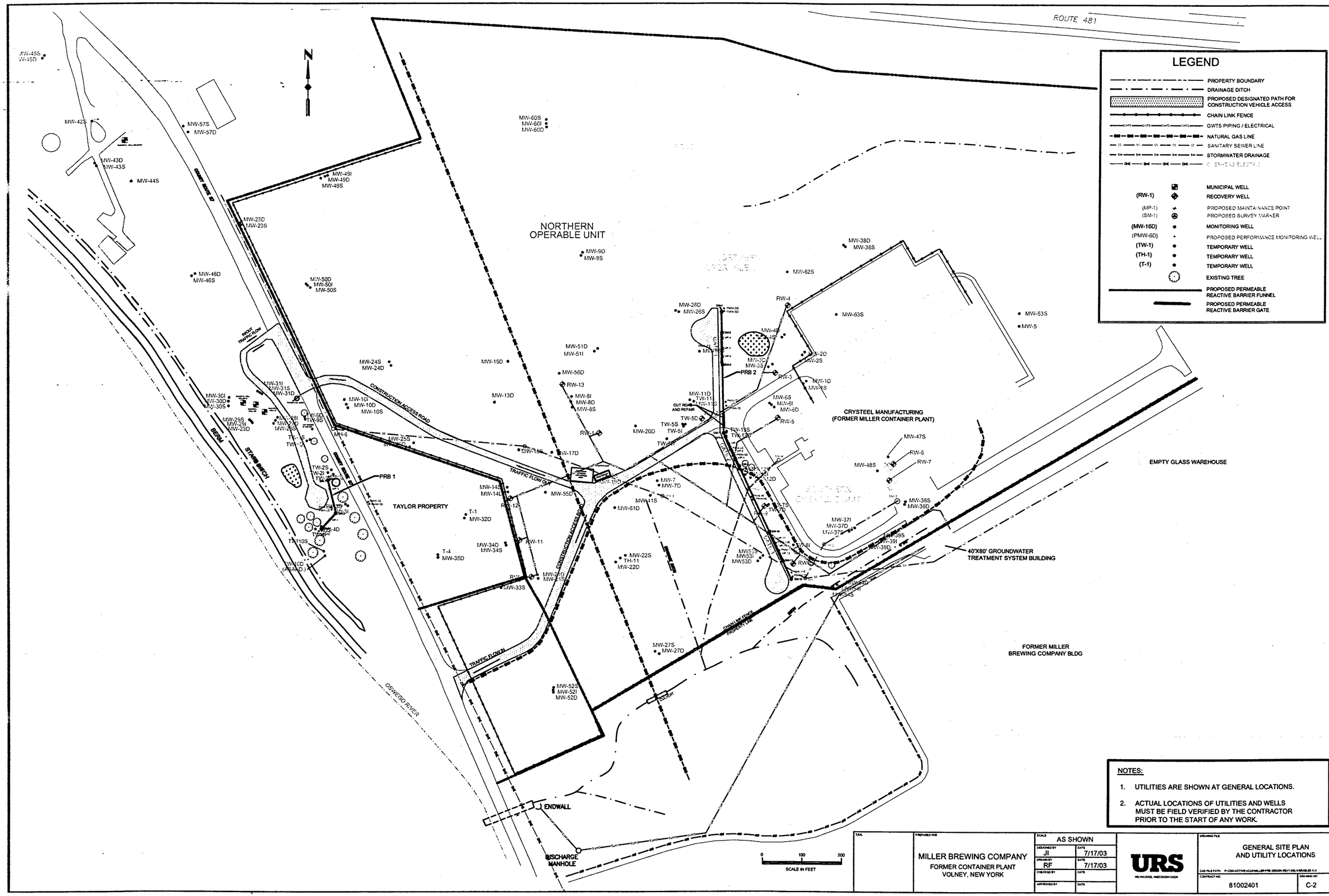
JUNE, 2003

DRAWING NO.	TITLE
C-1	COVER SHEET, LOCATION MAPS, AND INDEX OF DRAWINGS
C-2	GENERAL SITE PLAN AND UTILITY LOCATIONS
C-3	PROPOSED SITE CONSTRUCTION FEATURES AND PRB INSTALLATION PLAN
C-4	PRB AREA 1 LOCATION PLAN DETAIL AND SECTION
C-5	PRB AREA 2 LOCATION PLAN DETAIL AND SECTION
C-6	PERFORMANCE MONITORING WELL, MAINTENANCE POINT, AND SURVEY MARKER CONSTRUCTION DETAIL
C-7	ESTIMATED EXTENT OF PCE / TCA CONTAMINATION AND PRB CONSTRUCTION PLAN
C-8	EROSION CONTROL AND SOIL DISTRIBUTION PLAN
C-9	EROSION CONTROL AND ACCESS ROAD DETAILS



VICINITY LOCATION

SEAL	PREPARED FOR: MILLER BREWING COMPANY, FORMER CONTAINER PLANT, VOLNEY, NEW YORK	SCALE: NO SCALE; DESIGNED BY: JI, DATE: 7/17/03; DRAWN BY: RF, DATE: 7/17/03; CHECKED BY: DATE: ; APPROVED BY: DATE:	URS, MILWAUKEE, WISCONSIN 53228	DRAWING FILE: COVER SHEET, LOCATION MAPS, AND INDEX OF DRAWINGS; CAD FILE PATH: P:\GIS\ACTIVE\ACAD\MILLER\PRB DESIGN DELIVERABLES\C-1; CONTRACT NO: 81002401; DRAWING NO: C - 1; REV NO: 1



NOTES:

1. UTILITIES ARE SHOWN AT GENERAL LOCATIONS.
2. ACTUAL LOCATIONS OF UTILITIES AND WELLS MUST BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF ANY WORK.

SEAL	PREPARED FOR: MILLER BREWING COMPANY, FORMER CONTAINER PLANT, VOLNEY, NEW YORK	SCALE: AS SHOWN	URS MILWAUKEE, WISCONSIN 53224	DRAWING FILE: GENERAL SITE PLAN AND UTILITY LOCATIONS	
		DESIGNED BY: JI — DATE: 7/17/03		CAD FILE PATH: P:\GIS\ACTIVE\ACAD\MILLER\PRB DESIGN REV1 GIS\VARIABLES C-2	
		DRAWN BY: RF — DATE: 7/17/03		CONTRACT NO.: 81002401	DRAWING NO.: C-2 — REV. NO.: 1
		CHECKED BY: — DATE:			
		APPROVED BY: — DATE:			

N

NORTHERN OPERABLE UNIT

ROUTE 481

COUNTY ROUTE 57

CONSTRUCTION ACCESS ROAD

TRAFFIC FLOW OUT

TRAFFIC FLOW IN

EXTEND / WIDEN ACCESS ROAD

IN/OUT TRAFFIC FLOW

15' WIDE ACCESS ROAD

TURN AROUND 30' RADIUS

TEMPORARY SPOILS STOCKPILE, TYP.

PRB 1

PRB 2

CUT ROAD AND REPAIR

BERM

STARR BIRCH

EMPTY PARK LOT

TAYLOR PROPERTY

CRYSTEEL MANUFACTURING (FORMER MILLER CONTAINER PLANT)

EMPTY GLASS WAREHOUSE

40'X80' GROUNDWATER TREATMENT SYSTEM BUILDING

FORMER MILLER BREWING COMPANY BLDG

CHAIN LINK FENCE

PROPERTY LINE

OSWEGO RIVER

MW-45S MW-45D
MW-42S
MW-57S MW-57D
MW-43D MW-43S
MW-44S
MW-49I MW-49D MW-49S
MW-23D MW-23S
MW-46D MW-46S
MW-50D MW-50I MW-50S
MW-60S MW-60I MW-60D
MW-9D MW-9S
MW-51D MW-51I
MW-15D
MW-24S MW-24D
MW-56D
RW-13
MW-13D
MW-8I MW-8D MW-8S
MW-10I MW-10D MW-10S
MW-30I MW-30D MW-30S
MW-29S MW-29I MW-29D
MW-28S MW-28I MW-28D
MW-27S MW-27I MW-27D
MW-31I MW-31S MW-31D
TW-9D TW-9S
TW-1S TW-1D
MH-6
MW-25S
TW-2S TW-2I TW-2D
TW-4S TW-4I TW-4D
TW-10S
TW-10D (ABAND.)
MW-18S MW-17D
RW-1
MW-20D
TW-5S TW-5I TW-5D
MW-19D
MW-14S MW-14I MW-14D
MW-55D
RW-12
T-1 MW-32D
MW-34D MW-34S
RW-11
T-4 MW-35C
MW-21D MW-21S
MW-33S
MW-61D
MW-31S
MW-22S TH-11 MW-22D
MW-52S MW-52I MW-52D
MW-7 MW-7D
TW-7S TW-7D
MW-62S
MW-38D MW-38S
MW-63S
MW-5
RW-4
MW-4D MW-4S
MW-3D MW-3S
RW-3
MW-2D MW-2S
MW-1D MW-1S
MW-11D TW-11I MW-11S
MW-6S MW-6I MW-6D
RW-5
TW-13S TW-13D
MW-47S
RW-6
RW-7
MW-48S
TW-12S TW-12I MW-12D
MW-36S MW-36D
MW-37I MW-37D MW-37S
MW-39S MW-39I MW-39D
TW-8I
RW-8
MW53S MW53I MW53D
MW-54D MW-54I MW-54S

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE DITCH
- PROPOSED DESIGNATED PATH FOR CONSTRUCTION VEHICLE ACCESS
- CHAIN LINK FENCE
- TEMPORARY SPOILS STOCKPILE
- PROPOSED TREE REMOVAL AND REPLACEMENT
- PROPOSED PERMEABLE REACTIVE BARRIER FUNNEL
- PROPOSED PERMEABLE REACTIVE BARRIER GATE
- (MP-1) PROPOSED MAINTENANCE POINT
- (SM-1) PROPOSED SURVEY MARKER
- (PMW-6D) PROPOSED PERFORMANCE MONITORING WELL
- (TW-1) TEMPORARY WELL
- (TH-1) TEMPORARY WELL
- (T-1) TEMPORARY WELL
- (MW-16D) MONITORING WELL
- MUNICIPAL WELL
- (RW-1) RECOVERY WELL

NOTES:

1. REFER TO WORK PLAN FOR LOCATIONS OF DESIGNATED WORK AREAS.

0 100 200
SCALE IN FEET

SEAL

PREPARED FOR
MILLER BREWING COMPANY
FORMER CONTAINER PLANT
VOLNEY, NEW YORK

SCALE: AS SHOWN
DESIGNED BY: JI — DATE: 7/17/03
DRAWN BY: RF — DATE: 7/17/03
CHECKED BY: — DATE:
APPROVED BY: — DATE:

URS
MILWAUKEE, WISCONSIN 53226

DRAWING FILE
PROPOSED SITE CONSTRUCTION FEATURES AND PRB INSTALLATION PLAN
CAD FILE PATH: MILLER-PRB DESIGN-REV1 DELIVERABLES D-3
CONTRACT NO. 81002401
DRAWING NO. C-3
REV NO. 1

Appendix B
Manufacturer's Data Sheets

product Mirafi® Silt Fence

Prefabricated Silt Fence Structures for Sediment Control

Mirafi® Construction Products offers a wide range of woven geotextiles for sediment control applications. These fabrics are cost-effective elements which improve and enhance modern construction techniques in a variety of civil engineering applications.

PRODUCT DESCRIPTION

Mirafi® Silt Fence structures, specially developed fabrics on supporting posts, are designed for efficient control of sediment run-off from construction sites. This sediment, left unchecked, can clog and pollute native waterways and damage natural areas. Controlling the run-off (an increasing environmental concern) is advantageous to owners, contractors and engineers who face the economic costs associated with site sediment loss. Installed correctly in the field, the sedimentation control fabric in silt fence structures functions as a filter and a run-off flow velocity check. Fine-grained sediment is trapped by the fabric while storm water run-off may pass through the fabric at a moderate rate.

FEATURES AND BENEFITS

Mirafi® Silt Fence is prefabricated with posts and is ready for immediate installation upon delivery to your site. The prefabricated system has a number of unique features and advantages:

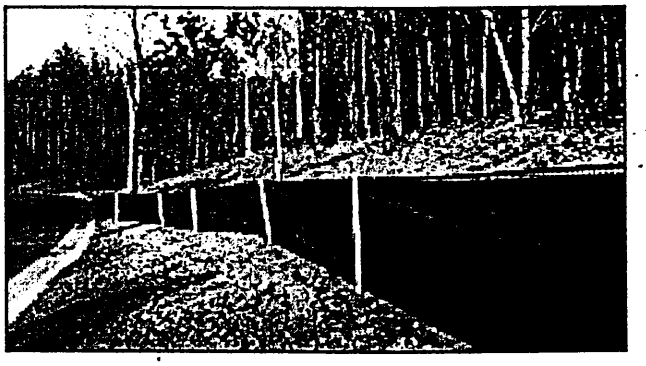
- Complete prefabricated system incorporating Mirafi®100X woven fabric
- 3.2cm (1-1/4") nominal square hardwood posts
- Available in 2.5m (8.3ft) and 3.0m (10.0ft) post spacings.

Mirafi® Envirofence® is recommended for use as sediment control when additional strength and support are required. Envirofence features include:

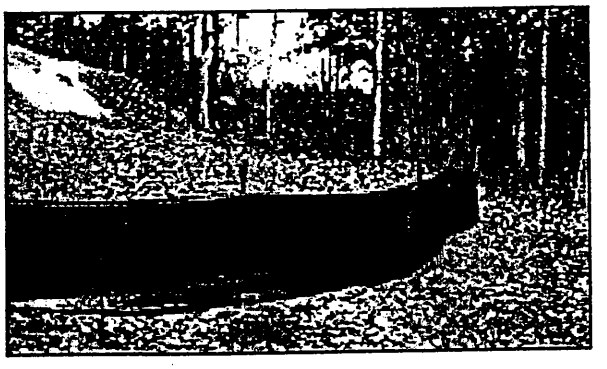
- Complete pre-fabricated system incorporating Mirafi®100X woven fabric
- 3.2cm (1-1/4") nominal square hardwood posts
- Additional plastic net backing for reinforced support
- Available in 2.5m (8.3ft) post spacings

Mirafi® Silt Fence Fabrics

Mirafi® also provides you with an assortment of UV stabilized, nonfabricated sediment control fabrics in a choice of lengths. Each fabric is designed to meet the specifications and regulations for sedimentation control required by local governmental agencies.



Mirafi® Silt Fence used in erosion control application.



Mirafi® prefabricated Silt Fence.

Ten Cate Nicolon

Technical Data MIRAFI®

Engineered Solutions for an Innovative World

product

Mirafi® Silt Fence

Prefabricated Silt Fence Structures for Sedimentation Control

Mirafi® Silt Fence Technical Data (All values are minimum average roll values)

PROPERTY	TEST METHOD	UNITS	SILT FENCE (100X) MINIMUM AVERAGE ROLL VALUES	ENVIROFENCE* (100X) MINIMUM AVERAGE ROLL VALUES
Grab Tensile Strength (machine direction)*	ASTM D 4632	N (lbs)	550 (124)	550 (124)
Grab Tensile Strength (cross-machine direction)*	ASTM D 4632	N (lbs)	550 (124)	550 (124)
Grab Tensile Elongation	ASTM D 4632	%	15/15	15/15
Mullen Burst Strength	ASTM D 3786	kPa (psi)	2060 (300)	2060 (300)
Trapezoid Tear Strength	ASTM D 4533	N (lbs)	290 (65)	290 (60)
Permittivity	ASTM D 4491	sec^{-1}	0.10	0.10
Water Flow Rate	ASTM D 4491	$l/min/m^2$ (gal/min/ft^2)	405 (10)	405 (10)
Ultraviolet Stability	ASTM D 4355	%	70	70

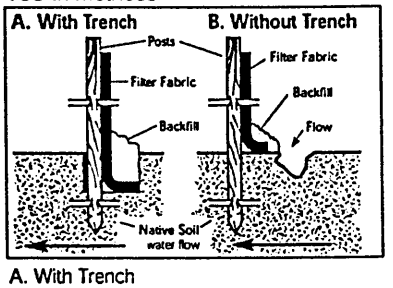
* Envirofence working strength is enhanced further by the incorporation of a polymeric mesh providing a tensile strength of 140 lbs/ft (typical) in both machine and cross machine directions.

Mirafi® Silt Fence Packaging

SILT FENCE TYPE	LENGTH m (ft)	FABRIC WIDTH m(ft)	POST LENGTH m(ft)	POST SPACING m(ft)	SHIPPING WEIGHTS kg(lbs)
Mirafi® Silt Fence	30.5 (100)	0.9 (3)	1.22 (4)	2.5 (8.3)	23 (50)
	30.5 (100)	0.9 (3)	1.22 (4)	3.0 (10)	20 (45)
Mirafi® Envirofence®	30.5 (100)	0.9 (3)	1.22 (4)	2.5 (8.3)	25 (55)
100CX (Fabric Only)	varies	0.9 (3)	—	—	varies
100X (Fabric Only)	100.6 (330)	0.9 (3)	—	—	12 (26)

Mirafi® Silt Fence Installation Guidelines

Toe-In Methods



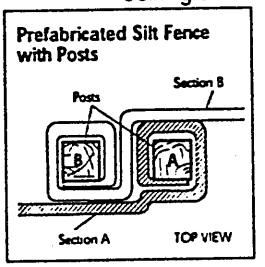
A. With Trench

- Excavate a 15.2 cm x 15.2 cm (6" x 6") trench along lower perimeter of site.
- Unroll silt fence one section at a time. Posts should be positioned on downstream side of fence.
- Drive post into ground and lay the toe-in fabric flap in bottom of trench. Backfill trench, and tamp ground as shown in diagram above.

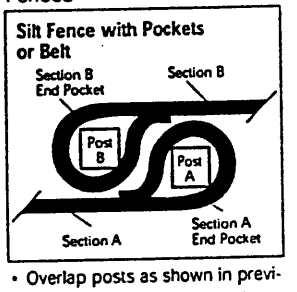
B. Without Trench

- Toe-in can also be accomplished by laying the fabric flap on untrenched ground and piling and tamping soil over the flap at the base of structure.

Joining Sections of Silt Fences



- Position posts to overlap as shown above, making certain that fabric folds around each post one full turn.
- Drive posts tightly together and secure tops of posts by tying off with cord or wire to prevent flow-through of built-up sediment at joint.



- Overlap posts as shown in previous section to prevent flow-through.
- Drive posts firmly together and tie off tops of posts to prevent separation.

www.mirafi.com

TECHNICAL SERVICES
Complete technical assistance is available from Ten Cate Nicolon and its sales representatives. Service include assistance during design and specification stages as well as initial stages of installation.

WARRANTY
Ten Cate Nicolon warrants that the product that it sells will conform to the specifications published in this literature. For information on limitations to this warranty, contact Ten Cate Nicolon.

CORPORATE OFFICE
365 South Holland Drive • Pendergrass, GA 30567
(888) 795-0808 • (706) 693-2226 • Fax (706) 693-4400

Ten Cate Nicolon

NORTH AMERICAN GREEN

MATERIAL SPECIFICATION

S150

The erosion control blanket shall be a machine-produced mat of 100% agricultural straw matrix with a functional longevity of approximately 12 months.

The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with lightweight photodegradable polypropylene netting having an approximate 0.50 x 0.50 inch (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers (50 stitches per roll width) with degradable thread.

The blanket shall be manufactured with a colored line or thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) to ensure proper material overlapping.

The straw erosion control blanket shall be S150 as manufactured by North American Green, or equivalent. The S150 erosion control blanket shall have the following properties:

Material Content

Matrix	100% Straw Fiber (0.50 lb/yd^2) (0.27 kg/m^2)
Netting	Both sides lightweight photodegradable (1.64 lbs/1,000 ft^2 [0.80 kg/100m^2] approximate weight)
Thread	Degradable

Physical Specifications (per roll)

	English	Metric
Width	6.67 ft	2.03 m
Length	108.00 ft	32.92 m
Weight	40.00 lbs ± 10%	18.14 kg
Area	80.00 yds^2	66.89 m^2
Stitch Spacing	1.50 inches	3.81 cm

Appendix E

Other Field Forms

URS

Daily Field Report

Owner: Miller Brewing Company

Project: Miller Brewing PRB Design Build, Fulton, NY

Project No.: 81002401.01

Contractor(s):

Contractor Super(s):

Project Manager: James Imbrie

H&S Officer: Ken Yates

Report No.:

Page: 1 of

Day:

Date:

Weather: A.M. / P.M.

Temp (F): High / Low

Rain /Snow: Winds:

Number and Function of Contractors' Personnel, Hours Worked (Identify Subcontractors Separately)

Contractor	Function	Hours

Major Constr. Equip. Description	Size/Capacity	No.	Location

Visitors

Representing

Daily Notes:

Copies to:

Signature:

URS

Daily Field Report

Report No. _____

Page _____

Day _____

Date _____

Signature: _____

TAILGATE MEETING FORM

Project Name: _____ **Date:** _____

Project Number: _____ **Presented by:** _____

Check the Topics/Information Reviewed:

safety glasses, hard hat, safety boots
site safety plan review and location
equipment and machinery familiarization
employee Right-To-Know/MSDS location
open pits, excavations, and site hazards
vehicle safety and driving/road conditions
portable tool safety and awareness
overhead utility locations and clearance
first aid, safety, and PPE location
sharp object, rebar, and scrap metal hazards
safety is everyone's responsibility
latex gloves inner/nitrile gloves outer
excavation/trenching inspections/documentation
full face respirators with proper cartridges
upgrade to level c at: FID/PID (___ eV)>___ppm
work stoppage at: FID/PID(___eV)>___ppm, %LEL>10%

slips, trips, and falls
directions to hospital
anticipated visitors
electrical ground fault
public safety and fences
excavator swing and loading
orderly site and housekeeping
smoking in designated areas
leather gloves for protection
effects of the night before
vibration related injuries
fire extinguisher locations
eye wash station locations
decontamination procedures

daily work scope
emergency protocol
parking and laydown
hot work permits
strains and sprains
noise hazards
no horseplay
heat and cold stress
backing up hazards
accidents are costly
dust and vapor control
refueling procedures
confined space entry
flying debris hazards

CHECK KILL SWITCH DAILY BEFORE DRILLING OPERATIONS BEGIN

Discussion/Comments/Follow-up Actions: _____

_____

_____

_____

NAME	SIGNATURE	COMPANY

Instructions:

Conduct a daily safety meeting prior to beginning each day's site activities.
Complete form by checking off specific topics and/or hazards.
Obtain signatures form all staff and subcontractors.
Follow-up on any noted items and document resolution of any action items.