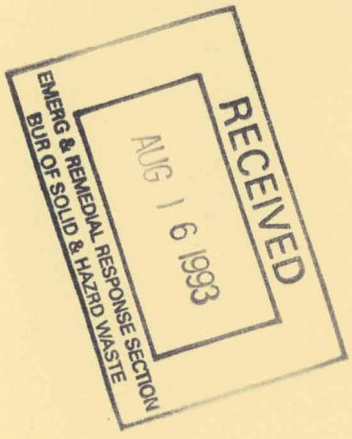

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN SOIL VAPOR EXTRACTION SYSTEM

Wausau Water Supply Site
Wausau, Wisconsin

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AUGUST 1993
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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

This Construction Quality Assurance Project Plan (CQAPP) has been prepared as part of the Remedial Design (RD) for construction of the Soil Vapor Extraction System (SVE) for the Wausau Water Supply Site, Wausau, Wisconsin. The SVE will be constructed in Wausau, Wisconsin on the Marathon Electric and Wausau Chemical (Sites). The project involves a number of field activities requiring testing to assure compliance with project specifications. The field activities include the installation/construction, operation and maintenance of:

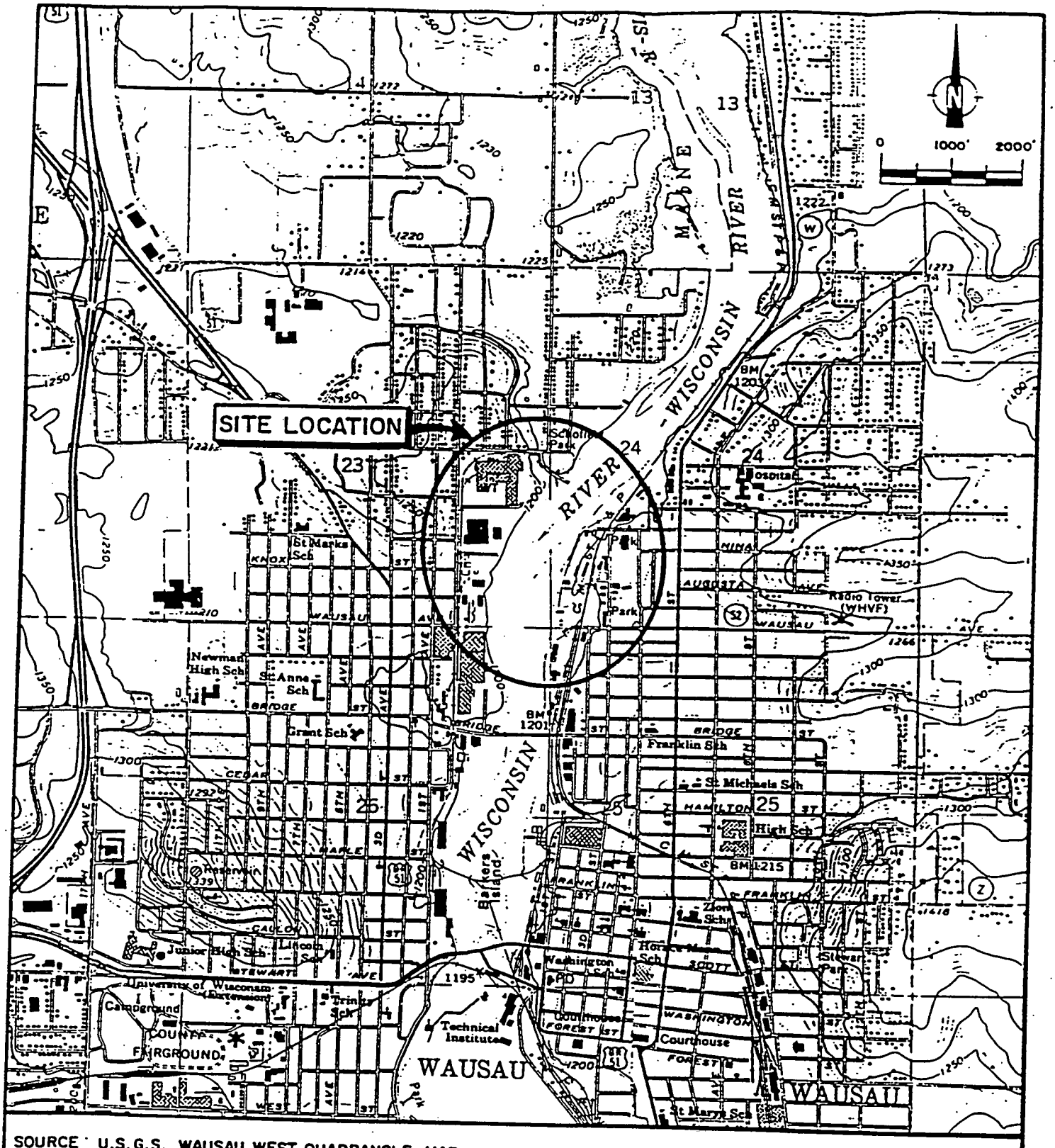
- a soil vapor extraction system, including wells and trenches;
- a vapor treatment system;
- underground and above ground piping;
- Site clearing; and
- restoration.

The CQAPP includes:

- The outline of responsibility and authority of the organizations involved in the project;
- the SVE contractor qualifications and key personnel involved in the construction of the SVE system including the construction quality assurance officer and supporting personnel;
- inspection activities including observations, tests and inspections that will be used to monitor construction, and the frequency of performance of these activities; and
- the reporting requirements to document CQAPP activities.

1.1 SITE LOCATION AND BACKGROUND

The Wausau Superfund Site is located within the City of Wausau which is located in north-central Wisconsin along the Wisconsin River in Marathon County, Wisconsin. Figure 1.1 shows the location of the Site. The Site consists of two areas separated by the Wisconsin River. The property comprising



SOURCE: U.S.G.S. WAUSAU WEST QUADRANGLE MAP.

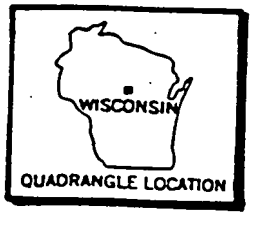


figure 1.1
SITE LOCATION
Wausau Water Supply Site

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the former City of Wausau landfill is presently owned by Marathon Electric Company and is located on the west side of the Wisconsin River. The east side location is owned by the Wausau Chemical Corporation. These two locations are considered source areas for contaminants in the aquifer, which is the source of drinking water for the City of Wausau. Figure 1.2 identifies the location of the former City landfill, Wausau Chemical Corporation and Marathon Electric Company.

1.1.1 Background

Previous investigations have identified several potential point sources of VOC contamination which are impacting the City of Wausau production well fields. Results of groundwater quality analyses for VOCs conducted during the Remedial Investigation (RI) in 1987 and 1988 show a vertical and lateral distribution of total chlorinated ethenes which suggests that a minimum of three sources, as described below, are affecting the City well field. Three primary chlorinated ethene compounds have been identified at the Site; tetrachloroethene (PCE), trichloroethene (TCE) and 1,2-dichloroethene (DCE). Additional contaminants of concern have been identified at very low levels during the Site investigation. Table 1.1 provides a list of VOCs which have been detected in the soil or groundwater at the Site.

1.1.2 West Side Source Area

The former City landfill/Marathon Electric (ME) property occupies a former sand and gravel pit located on the west bank of the Wisconsin River. The landfill, which consists of approximately 4.5 acres, operated between 1948 and 1955 and accepted the majority of commercial, industrial and residential waste generated within the City of Wausau. The majority of the former landfill area is currently being used as a parking lot and is covered with a bituminous pavement; the southern portion is vegetated. The estimated extent of the former landfill is shown in Figure 1.3.

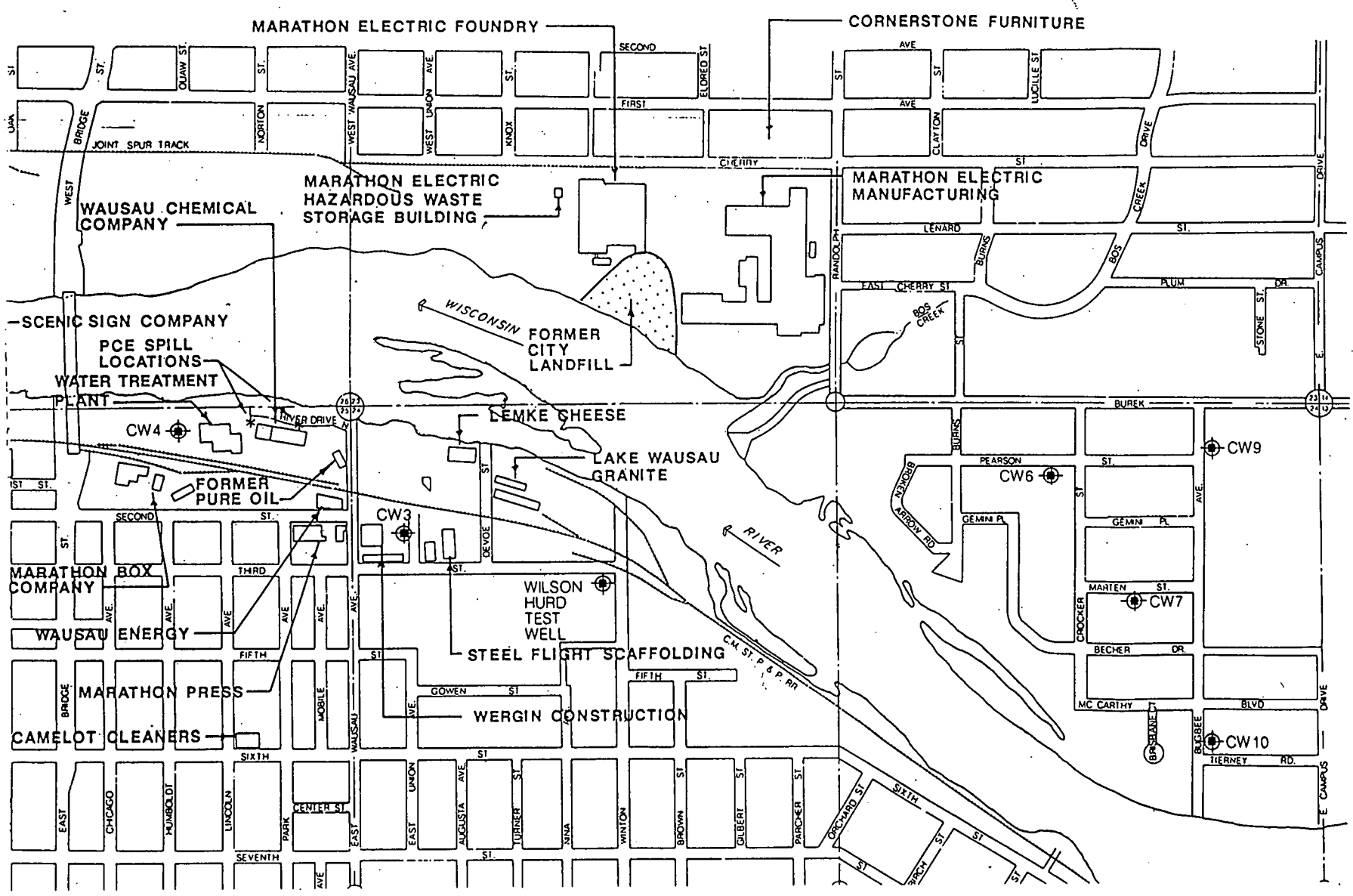

figure 1.2
SITE PLAN
Wausau Water Supply Site

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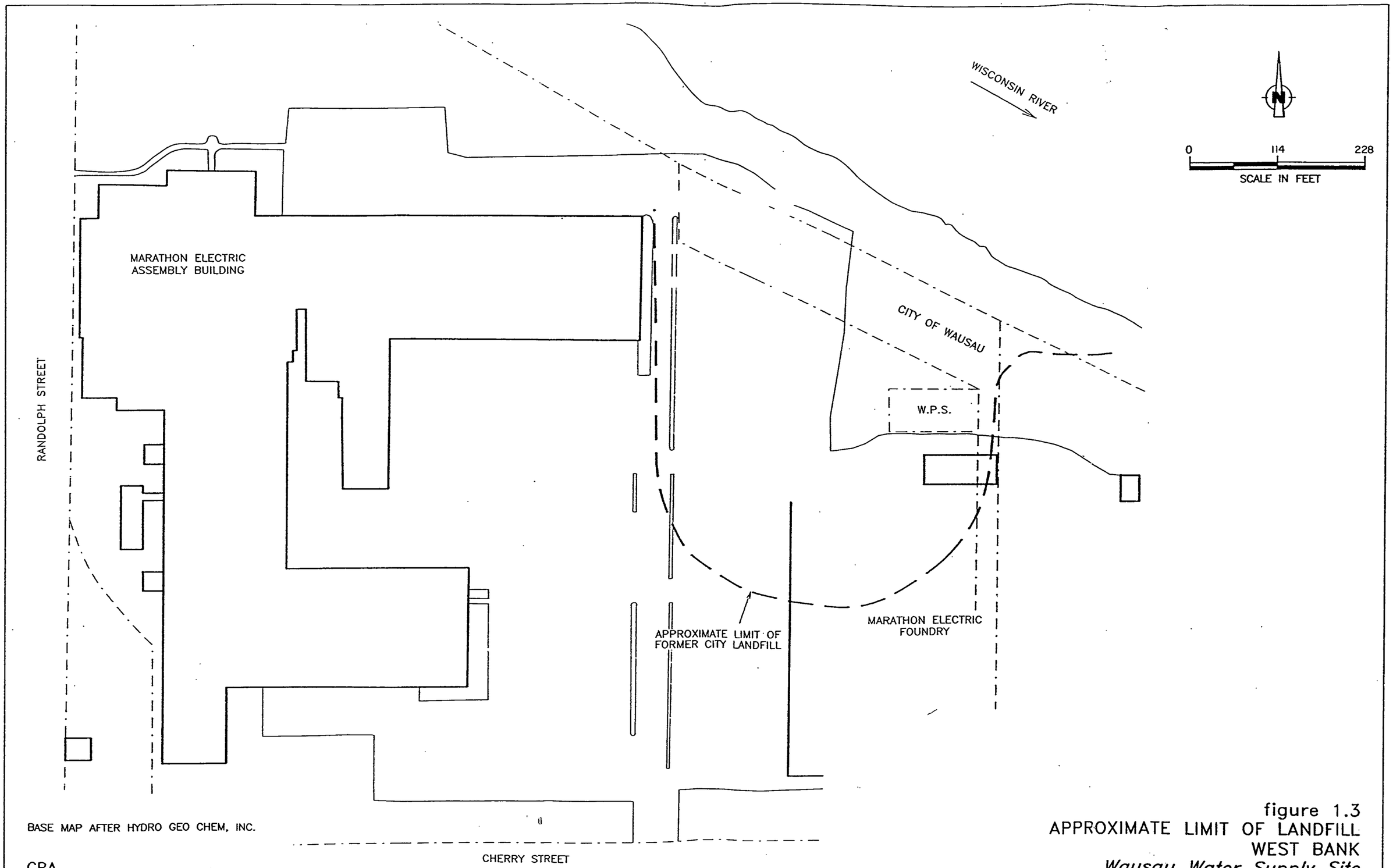

BASE MAP AFTER HYDRO GEO CHEM, INC.

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figure 1.3
APPROXIMATE LIMIT OF LANDFILL
WEST BANK
Wausau Water Supply Site

TABLE 1.1

VOC PARAMETERS IDENTIFIED ON-SITE

Analyte	Maximum Concentration in Soil Gas Survey (µg/l)
Acetone	NA
Benzene	9.2
2-Butanone	NA
Carbon tetrachloride	ND
Chlorobenzene	NA
Chloroform	5.2
1,2-Dichloroethane	ND
1,1-Dichloroethene	11.2
cis-1,2-Dichloroethene	567
trans-1,2-Dichloroethene	18.7
Ethylbenzene	190
Methylene chloride	ND
4-Methyl-2-pentanone	NA
Tetrachloroethene	7,680
Toluene	6.8
1,1,1-Trichloroethane	144
1,1,2-Trichloroethane	NA
Trichloroethene	2,004
1,1,2-Trifluoro-1,2,2-trichloroethane	12.0
Vinyl chloride	2.9
Xylenes	39.3

NA - not analyzed

ND - not detected at 0.01 µg/l, but has been present in previous soil or groundwater sampling events

Elevated concentrations of TCE were detected in the groundwater, soil and soil gas samples obtained from the northern portion of the landfill. Soil gas TCE concentrations in the vicinity of the landfill, measured during the SVE pre-design investigation, ranged from below detection limits (1.0 µg/l) to 298 µg/l. Soil samples obtained from borings in the vicinity of the landfill collected during the RI contained TCE concentrations of approximately 200 µg/l. Groundwater samples obtained from the vicinity of the landfill indicate TCE concentrations ranging from 16 µg/l to 1,900 µg/l. 1,1,1-trichloroethane (TCA), DCE, chloroform and carbon tetrachloride and non-chlorinated solvents were also detected in the vicinity of the landfill at concentrations below 100 µg/l.

1.1.3 East Side Source Area (North and South Ends of Site)

The Wausau Chemical Company (WC) is located on the east bank of the Wisconsin River. The facility, established in 1964, is a bulk solvent distributor and transfer station for the shipment of solvents and waste chemicals from area businesses. The facility experienced two documented PCE spills in 1983 totaling approximately 1,000 gallons.

Soil gas and soil boring data, collected during the RI and the SVE pre-design investigation indicate higher concentrations of contaminants in the area located in the southern portion of the facility (Wausau Chemical tank farm) and in soils near the north loading dock. The highest levels of VOCs in the soil gas were reported from the southern end of the facility with PCE at a concentration of 7,680 µg/l, TCE at a concentration of 2,004 µg/l and DCE at a concentration of 585 µg/l. Analysis of soil samples indicated 3,500 µg/kg of PCE in the vicinity of north loading dock.

1.2 CQAPP ORGANIZATION

The purpose of this CQAPP is to provide a quality control protocol for the construction of the SVE system. Section 2 of this CQAPP presents the project organization, responsibilities and qualifications of project

personnel. Project meetings are described in Section 3, while inspection and testing activities requirements are described in Section 4. Documentation requirements are described in Section 5.

2.0 PROJECT ORGANIZATION, RESPONSIBILITIES AND PERSONNEL QUALIFICATIONS

2.1 ORGANIZATION

CRA will have overall responsibility for ensuring compliance with the final remedial design. This responsibility will include overseeing the field work to ensure that the final remedy is completed in accordance with the approved RD documents.

A Construction Quality Assurance (CQA) Officer will be selected who will report to the Project Manager. The CQA Officer will be responsible for implementation of this CQAPP and for ensuring that all field testing, as outlined herein, is completed in accordance with current standards and at the frequency identified.

Surveyors and testing laboratories who are independent from the Contractor will be hired by the Project Manager to perform field testing activities and report results to the Project Manager and CQA Officer. The Project Manager and the CQA Officer will be responsible for the accuracy of all construction as-built data, as well as soils and materials testing. The Contractor will be responsible for following the plans and specifications provided by CRA. The Contractor will follow the direction of the CQA officer and support personnel.

The U.S. EPA and WDNR on-Site Representatives will work with their respective agencies to determine when all RA work tasks have been satisfied. The WDNR oversight engineer will be on-Site during construction activities and will serve as the U.S. EPA's on-Site inspector. The CQA officer and the WDNR oversight engineer will assure that the contractor has satisfied the requirements of the remedial design.

Figure 2.1 presents the organization chart for the SVE RA program.

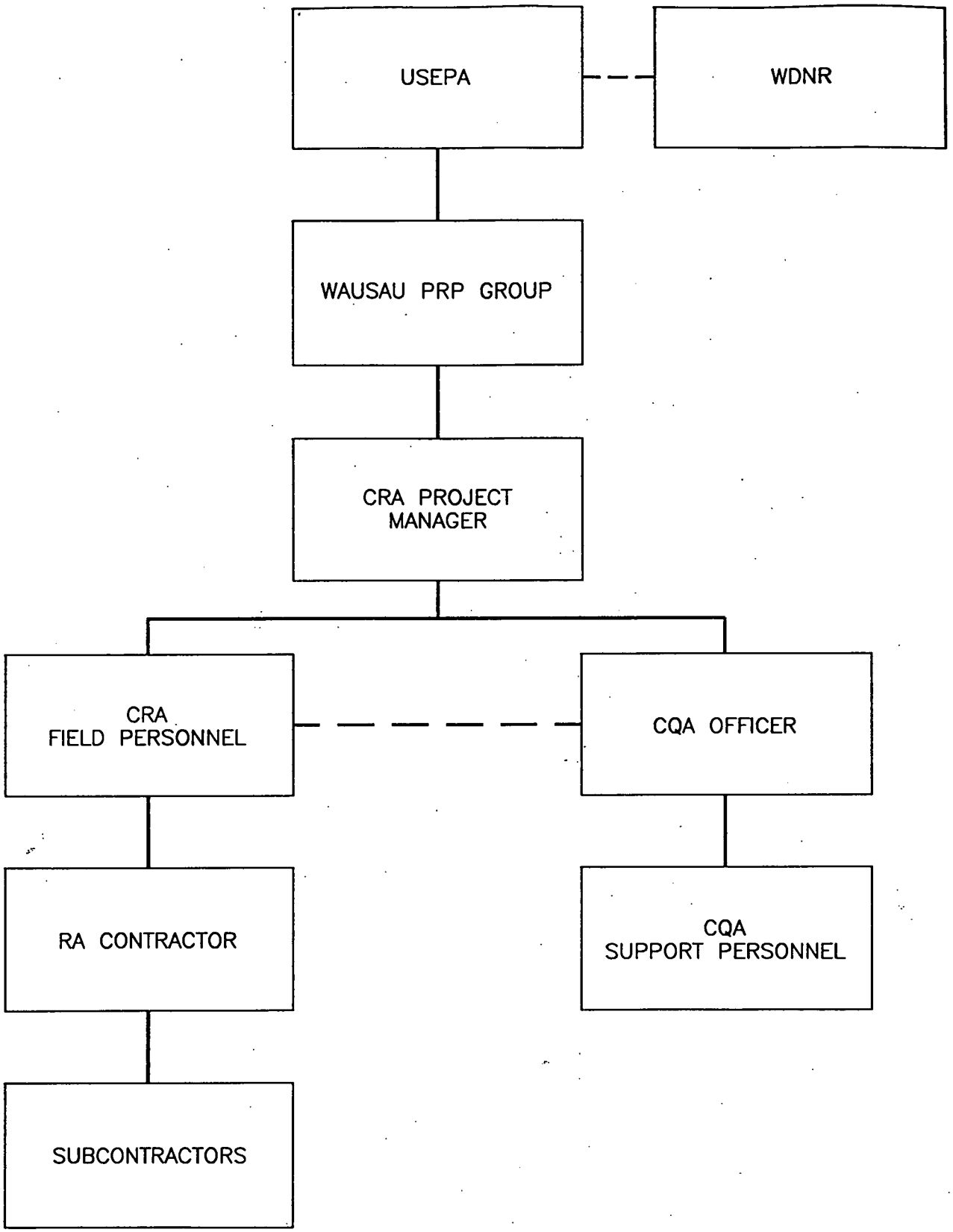

figure 2.1
CONSTRUCTION QUALITY ASSURANCE
PROJECT ORGANIZATION
Wausau Water Supply Site

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2.2 RESPONSIBILITIES AND QUALIFICATIONS

The overall responsibility of the CQA personnel is to perform specific inspection and testing activities specified in the CQAPP. These personnel will include a CQA Officer and CQA support personnel. The specific names and qualifications of the CQA Officer and support personnel or testing firms will be provided to the U.S. EPA and WDNR approximately 15 days prior to commencing RA field activities.

2.2.1 CQA Officer

The CQA Officer will be assigned the responsibility for all aspects of the CQAPP implementation. The CQA Officer will be responsible to the Respondents and CRA, but will function independently of the Respondents, CRA and the Contractor.

The CQA Officer will have overall responsibility to ensure that his/her CQA support personnel carry out the daily field testing in accordance with current testing standards. The CQA Officer will conduct quality assurance (QA) audits on the field testing data on a regular basis as determined necessary by him/her based on the type and frequency of testing being completed.

The CQA Officer will have the following qualifications:

1. Graduate of a recognized college in a technically related field;
2. Minimum two (2) years related experience; and
3. Good management and communication skills.

2.2.2 CQA Support Personnel

The CQA support personnel will report directly to the CQA Officer. They will be responsible for insuring that field testing is completed as described in Section 4 and that inspection for earthwork and piping is conducted

on an as required basis depending on what RA work tasks are being completed. In many cases during the RA program, the field personnel will report their field testing results verbally to CQA personnel. All verbal results will be noted in the CQA construction log book. Verbal reporting will be necessary to ensure continuity and uninterrupted progress of the RA work tasks. Verbal data reports will be followed by written data reports provided to the CQA Officer. The CQA Officer will evaluate the data periodically as described in Section 2.2.1.

The CQA support personnel will have the following minimum qualifications:

1. A degree from a recognized college in engineering technology, or equivalent; or a minimum of two years experience in CQA inspection procedures.

2. Working knowledge of all relevant codes and regulations concerning material and equipment installation, observation and testing procedures, equipment, documentation procedures, and Site safety.

2.3 RESPONSIBILITIES OF THE REMEDIAL ACTION CONTRACTOR

As requested by the Engineer, the remedial action contractor is required to submit technical and scheduling information for SVE components and subcontractors to the CQA Officer. Technical information may include components submittals, shop drawings and other product data. All subcontractors, suppliers, manufacturers and specific designated components must be approved by the Engineer before they can be utilized by the remedial action contractor in the construction of the SVE system.

3.0 PROJECT MEETINGS

Weekly progress meetings will be held during periods of active RA field implementation to ensure that the SVE system is constructed in accordance with the plans and specifications. These progress meetings will be attended by the CQA Officer, CRA's representatives and the Contractor's representative. In addition, the U.S. EPA, the WDNR or their Site Representatives will be notified of the scheduled meetings. These meetings will provide an opportunity for the U.S. EPA and the WDNR to review proposed modifications to the CQAPP if, in the opinion of the Project Manager and CQA Officer, field conditions indicate that modifications should be made to this plan. No modifications will be made to the CQAPP without the prior approval of the U.S. EPA with concurrence of the WDNR. Meeting minutes will be taken by the CQA Officer and support personnel.

In addition to the regular progress meetings the following meetings will occur during the progress of the RA.

1. Preconstruction CQA Meeting

   Purpose: Resolve any uncertainties in the final approved remediation design, CQAPP. Review levels of responsibility and reporting requirements.

   Present: Respondents, CRA, CQA Officer and support personnel, Contractor's Representative.

   Topics:

   A. Provide and discuss CQAPP, Health and Safety Plan, and other relevant documents.
   B. Review roles of each organization relative to the design criteria, plans and specifications within the CQAPP.
   C. Determine any need to modify the CQAPP that may be necessary to ensure the remediation performed will meet or exceed the specified design criteria.
   D. Review lines of authority and communication.

E. Discuss the established procedures or protocol for observations and tests including sampling strategies.
F. Discuss the established procedures or protocols for handling construction deficiencies, repairs and retesting.
G. Review methods for documenting and reporting inspection data.
H. Review methods for distributing and storing documents and reports.
I. Review work area access, security and safety protocol.
J. Discuss the location and storage of construction equipment and materials during off hours and the protection of these items during inclement weather.
K. Discuss the protection of uncompleted construction work during off hours and during inclement weather.
L. Conduct a Site tour to review off limits areas, construction areas, safety areas and equipment and materials storage locations.

2. Daily Progress Meetings

Purpose: To review daily work schedule and progress. This meeting is intended to be an informal meeting held at the end of each work day or at the start of each work day.

Present: CRA, CQA support personnel, Contractor Representative and others as requested.

Topics:
A. Review previous day's activities and progress.
B. Review work location and activities for upcoming day.
C. Review Contractor's personnel and equipment assignments for the upcoming day.
D. Discuss any potential construction problems.
E. Discuss any health and safety problems or questions, specific issues related to the day's work task.

3. Problem or Work Deficiency Meetings

Purpose: Only if a problem or deficiency is present or likely to occur as determined by the Engineer, the Contractor or the WDNR Oversight Engineer.

Present: CRA, CQA Officer and Support Personnel, Contractor Representative (if required).

Topics:

A. Define and discuss problem or deficiency.
B. Review alternative solutions.
C. Develop and implement a plan to resolve the problem or deficiency.

For all meetings held on Site during the RA, except the daily progress meetings, minutes will be taken. Copies of the minutes will be forwarded to the CRA Project Manager for distribution to all organizations present at the meeting and to the U.S. EPA and WDNR. Daily progress meetings will be documented in the CQA construction log book.

4. Handling of Conflicts Between the Engineer and the WDNR OverSite Engineer

If an event occurs in which the Engineer and the WDNR Oversight Engineer cannot agree on an item of construction quality or a construction process, the EPA Project Manager will be contacted by either the Engineer or the WDNR Oversight Engineer.

As appropriate and applicable, disputes shall be resolved in accordance with Section XIII, Dispute Resolution, as provided in the Consent Decree.

4.0 INSPECTION AND TESTING ACTIVITIES

4.1 SCOPE

Throughout the implementation of the RA program, there will be numerous inspections and tests required for specific RA work tasks. The inspection and testing requirements will ensure compliance with RA documents as well as completion of the work tasks to the highest level of quality.

Inspections will provide a qualitative means of monitoring the work progress and quality. Specific field tests will provide quantitative means of monitoring the work progress and quality. Both forms will be important during the RA implementation.

The RA work tasks which will require some form of inspection or testing as described by the CQAPP are included in Table 4.1.

4.2 INSPECTIONS

Throughout the period of RA implementation, the quality of work completed and material used for each of the RA work tasks will be maintained at its highest possible level through regular inspections of the work. Inspections will be completed throughout the RA by the CQA Officer; the CQA support personnel on an as needed basis; the U.S. EPA and the WDNR on a periodic basis. Inspections will include:

i) daily inspections of the work progress;

ii) inspections of material as it is delivered to the Site to check for damage during delivery;

iii) comparison of the material delivered to the Site to the design specifications to ensure that the proper material has been delivered to the Site;

TABLE 4.1

SUMMARY OF CONSTRUCTION QUALITY ASSURANCE TESTING

Work Task to be Completed	Type of Test	Standard	Frequency of Test	Specific Values to be Met
Earthworks				
- Backfill Compaction	- Density Test	- ASTM D698	- per lift or as deemed necessary by Engineer	- 95% Standard Proctor density under pavements - 90% Standard Proctor under non-paved areas
	- Moisture Test	- ASTM D3017	- per lift or as deemed necessary by Engineer	- None
	- Bulk Density	- ASTM D1556, or D2167 or D2922		
- Backfill Material	- Particle Size Analysis	- ASTM D422 or D1140	- initially and per change in backfill material	- No frost chunks, rocks larger than lift thickness, roots, vegetation, deleterious material, material which will subside.
- Aggregate Material	- Sieve Analysis	- All material to be held by #4 Sieve - ASTM D692	- initially and per change in material	- Gradation 3
- Topsoil	- Designation	- WI DOT 632.2.3	- 1 sample	-
Piping				
- HDPE Pipe	- Resin	- ASTM D1248	- cut sheet approved, each pipe labeled	- PE3408
	- Pressure Test	- Modified ASME B31.1	- as appropriate	- + 1.0 psig

TABLE 4.1

SUMMARY OF CONSTRUCTION QUALITY ASSURANCE TESTING

Work Task to be Completed	Type of Test	Standard	Frequency of Test	Specific Values to be Met
- PVC Pipe	- SDR	- ASTM D1785	- cut sheet approved, each pipe labeled	- Sch. 80
	- Pressure Test	- Modified ASME B31.1	-	- + 1.0 psig
- Steel Pipe	- Quality	- ASTM A53, Grade B, Sch. 40	- cut sheet approved, each pipe labeled	- ASTM A53, Grade B, Sch. 40
	- Pressure Test	- Modified ASME B31.1	-	- + 1.0 psig
Electrical				
- Insulation	- Megger	--	- once	- up to 350V circuit - 500V instrument
			- once	- circuit - 350-600V 1,000V instrument
- Continuity	- Resistance Test	--	- once	- manufactures rated loss
Products				
- Finished Construction Products	- Comparison of Spec. or ApprovedMfr. Cut Sheet	--	- continuous	- As specified in approved cut sheets or approved by Engineer

iv) inspection of materials after they have been installed to ensure that they have not been damaged during installation;

v) general inspection to ensure compliance with all approved RA documents; and

vi) final inspection of each work task, including surveys where required, to verify completion of the work tasks and compliance with the RA documents.

The types of inspections required, the component of each RA work task to be inspected and the frequency of the inspections are summarized on Table 4.2.

In addition to the daily general inspections of the RA work, three scheduled inspections will be performed. These three inspections will include:

i) Preconstruction Inspection

The preconstruction inspection, as stated in the Consent Decree, will be performed prior to initiation of construction activities. It will include:

- a review of contract requirements;
- a check to ensure that all materials and/or equipment have been tested, submitted and approved;
- a check to ensure that provisions have been made to provide required control testing;
- examination of the work area to verify that all preliminary work has been completed;

TABLE 4.2

SUMMARY OF CONSTRUCTION QUALITY ASSURANCE INSPECTIONS

Work Task Component to be Inspected	Items to be Checked During Inspection	Type of Inspection	Frequency of Inspection
A) Vent Piping			
- Vent Piping Installation	- has trench been excavated to design depth	- visual or (batter boards)	- continuous
	- is native material acceptable as pipe bedding material	- visual	- continuous
	- is material suitable as backfill	- visual	- continuous
	- are backfill lifts as designed	- visual or (batter board)	- continuous
	- have fused joints cooled or solvent welded joints dried before backfilling	- touch	- prior to backfilling
B) Vegetation	- have areas been graded and sloped prior to topsoil placement	- visual (comparison to surrounding elevations)	- continuous
	- has topsoil been placed to design thickness	- visual (grade stakes)	- upon completion
	- have seed, fertilizer and mulch been applied at the specified rate	- count containers or bales	- at beginning, during and end of work
	- has mulching occurred within 24 hours of seeding	- visual	- continuous
	- have watering and maintenance been performed	- visual	- continuous
C) Treatment Skid	- has skid been constructed as designed	- visual	- continuous
	- has Wausau Inspection Department staff performed inspections	-	-
D) Paint	- has the surface preparation met with mfrs. directions	- visual	- continuous
	- does paint meet specification	- visual	- before application
	- is mil thickness meet specification	- visual or (mil gauge)	- upon completion of curing
	- is there any touch-up painting required	- visual	- upon completion of work

TABLE 4.2

SUMMARY OF CONSTRUCTION QUALITY ASSURANCE INSPECTIONS

Work Task Component to be Inspected	Items to be Checked During Inspection	Type of Inspection	Frequency of Inspection
E) Mechanical	- are the components the ones specified	- visual	- before installation, compare equipment tag to specification and/or mfrs. cut with Engineer's approval stamp
	- are all above ground pipes square to the floor and/or the building walls	- visual	- Upon completion, prior to painting
	- are the components installed securely in accordance with mfrs. specification	- visual	- periodically and upon completion
	- are the components installed as shown on the drawings	- visual	- periodically and upon completion
	- has Wausau Inspection Department staff performed inspections	- visual	- periodically
F) Electrical	- does wire gauge meet specification or mfrs. specification	- visual	- periodically and upon completion
	- are connections tight	- tactile	- periodic checks
	- are wiring and components installations as shown on the plans and in accordance with the specification	- visual	- periodically and upon completion
	- have all boxes been cleaned/vacuumed of metal shavings and debris	- visual	- periodically and upon completion
	- has Wausau Inspection Department staff performed inspections	- visual	- periodically

- a physical examination of materials, equipment and sample work to ensure that they conform to the Contract Drawings or submittal data and that all materials and/or equipment are on hand;
- a review of methods for documenting and reporting inspection data;
- a review of methods for distributing and storing documents and reports;
- a review of work area security and safety protocol;
- a discussion of any proposed modifications of the CQAPP to ensure that Site-specific considerations are addressed; and
- a Site walk-around to verify that the design criteria, plans and specifications are understood and to review material and equipment storage locations.

ii) Prefinal Inspection

The prefinal inspection, as stated in the Consent Decree, will be performed upon preliminary construction completion of the RA work and will include:

- a walk-through inspection of the entire Site area;
- examination of the quality of workmanship;
- a review of control testing for compliance with contract requirements;
- a review of components for use of defective or damaged materials;
- a review of consistency with contract documents and the U.S. EPA approved remedy; and
- operational testing of equipment to allow certification that equipment functions properly and that specifications have been met.

Any outstanding, incorrect or incomplete construction items identified during the prefinal inspection will be identified, noted and corrected by the contractor. The Engineer will prepare and submit a Prefinal Inspection Report within 30 days of the prefinal inspection. The report will document any outstanding deficiencies identified, specify actions required to resolve the deficiencies and specify completion dates for these items. The report will also establish a date for the final inspection.

iii) Final Inspection

The Final Inspection will be conducted upon completion of all outstanding deficiencies identified during the Prefinal Inspection. The Final Inspection will consist of a walk-through inspection of the completed works using the Prefinal Inspection Report as a checklist for assuring proper construction completion. The Engineer and the contractor will certify that all outstanding items identified during the Prefinal Inspection have been resolved.

These inspections will be performed as stated in the Consent Decree and include the Project Manager, CQA Officer and support personnel, the U.S. EPA and the WDNR. The U.S. EPA and the WDNR Site Representatives will be notified by the CQA Officer at least three days in advance of any inspections.

The results of all inspections will be recorded in the daily summary report as described in Section 5.0. Results of the preconstruction, prefinal and final inspections, including problem resolutions if identified, will be recorded in separate inspection summary reports. Copies of the preconstruction, prefinal and final inspection reports will be provided to all parties involved in the inspection.

4.3 TESTING

In addition to the daily inspections of the RA work progress, material and on-Site testing will be carried out. Material and on-Site testing will

be completed to ensure compliance with material specifications and design criteria which were established in the RA documents and the final RA design. All earthwork testing and mechanical certification will be performed by an independent laboratory under the direction of the CQA Officer.

Specific components of the RA work tasks which will require material and on-Site testing include:

1. blower and blower controls,
2. vapor extraction piping installation,
3. control valves, metering and manifold piping installation,
4. pre-cast concrete components,
5. electrical supply and controls systems,
6. imported earthen materials,
7. building - to be determined as appropriate
8. painting system.

The testing requirements, methods of testing and testing frequency for each of these work task components were summarized previously in Table 4.1.

4.4 PRECONSTRUCTION APPROVALS OF MATERIALS

Preconstruction approval of products is performed by review of contractor supplied equipment cut sheets to verify that products used in the final construction meet the project specification. Manufacturers' cut sheets are reviewed and approved by the Engineer. The CQA officer will then compare the cut sheets to all equipment which is brought on-Site for installation.

4.5 IMPORTED MATERIALS

In the event that imported earthen materials must be used, such as pipe bedding material, backfill and topsoil; testing will be performed during construction.

4.5.1 Vegetation Layer Top Soil

The imported top soil source area may be sampled and the sampled area delineated. Tests may be performed to verify that the soil meets specifications. A determination will be made as to the suitability of the soil and what nutrients or soil additives may be required.

4.5.2 Sand Bedding

The sand source areas will be sampled and the sample areas delineated. The sample will be visually inspected to be free of rocks, roots, vegetation, debris and material which will prove unstable or damaging to the pipe.

5.0 INSPECTION DOCUMENTATION

This section details the documentation requirements for the CQAPP. The proper, thorough, and accurate documentation of all CQA Site activities is important in ensuring quality installations. CQA testing will be documented daily. Standard inspection documentation forms are provided in Appendix A. Forms may be modified/added/deleted as appropriate.

5.1 DAILY RECORD KEEPING

Standard daily reporting procedures will include photographing work in progress, preparation of a summary report with supporting inspection data sheets and, when required, problem/corrective action reports. A Contractor submittal register shall be developed to track submittal requirements.

5.1.1 Daily Summary Report

This report will be prepared daily by the CQA Officer during any earthwork inspection and testing and by the Contractor's representative during any other RA work activities. All reports will be submitted to the Project Manager.

This report shall include the following:

1. Unique identifying sheet number for cross-referencing and document control.

2. Date, project name, and other identification.

3. Data on weather conditions.

4. Reports on any meetings held and their results.

5. Construction tasks and locations of construction under way during the time frame of the daily summary report.

6. Descriptions of areas or units of work (blocks) being inspected and documented.

7. Description of off-Site materials received, including any quality verification (vendor certification) documentation.

8. Calibrations or recalibrations, of test equipment, including actions taken as a result of recalibration.

9. Decisions made regarding approval of units of material or of work (blocks), and/or corrective actions to be taken in instances of substandard quality.

10. Unique identifying sheet numbers of inspection data sheets and/or problem/corrective action reports used to substantiate the decisions described in the preceding item.

11. Signature of the CQA Officer or support personnel.

Items above shall be formulated into Site-specific checklists and data sheets so that details are not overlooked.

5.1.2 Inspection Data Sheets

All observations, and field and/or laboratory tests, shall be recorded on an inspection data sheet. Because of their highly specific nature, no standard format can be given for data sheets to record observations. Recorded observations may take the form of notes, charts, sketches, photographs, or any combination of these. Where possible, a checklist may be useful to ensure that no pertinent factors of a specific observation are overlooked.

Inspection data sheets shall include the following information:

1. Unique identifying sheet number for cross-referencing and document control including date, time and weather conditions.

2. Description or title of the inspection activity.

3. Location of the inspection activity or location from which the sample increment was obtained.

4. Type of inspection activity; procedure used (reference to standard method when appropriate).

5. Recorded observation or test data, with all necessary calculations.

6. Results of the inspection activity; comparison with specification requirements.

7. Personnel involved in the inspection activity.

8. Signature of the appropriate CQA inspection personnel and concurrence by the CQA Officer.

Items above will be formulated into Site-specific checklists and data sheets so that details are not overlooked.

5.1.3 Problem/Corrective Action Reports

A problem is defined as material or workmanship that does not meet the specified design. Problem/Corrective Action Reports will be cross-referenced to specific inspection data sheets where the problem was identified. They will include the following information:

1. Unique identifying sheet number for cross-referencing and document control.
2. Detailed description of the problem.

3. Location of the problem.
4. Probable cause.
5. How and when the problem was located (reference to inspection data sheets).
6. Estimation of how long problem has existed.
7. Suggested corrective action.
8. Documentation of correction (reference to inspection data sheets).
9. Final results.
10. Suggested methods to prevent similar problems.
11. Signature of the appropriate CQA support personnel and concurrence by the CQA Officer.

In some cases, not all of the above information will be available or obtainable. However, when available, such efforts to document problems could help to avoid similar problems in the future.

Proposed changes to the approved plans or specifications will be discussed with the WDNR OverSite Engineer. Field changes will be documented on the "Notice of Field Modification" form presented in Appendix A, which will be sent to the WDNR OverSite Engineer for approval.

Upon receiving the CQA Officer's written concurrence, copies of the reports will be sent to the Project Manager, who will then forward copies to the U.S. EPA and WDNR.

5.2 CONSTRUCTION TASK REPORTS

Within each Construction Task, there may be several quality characteristics or parameters, that are specified to be observed or tested, each by a different observation or test, with the observations and/or tests recorded on different data sheets. At the completion of each task, these data sheets shall be organized into a Construction Task Report. These reports may be used to summarize all of the Site construction activities.

Construction Task Reports will be prepared by the CQA Officer or support personnel and will include the following information:

1. Unique identifying sheet number for cross-referencing and document control.

2. Description of Construction Task (i.e., compaction of trench backfill, pressure testing of the ductwork, etc.).

3. Quality characteristic being evaluated; references to design criteria, plans, and specifications.

4. Sampling locations.

5. Inspections made (define procedure by name or other identifier; unique identifying number for inspection data sheets).

6. Summary of inspection results. Inspection results will include all data outside acceptable limits, and document corrective action and retest results.

7. Define acceptance criteria (compare task inspection data with design specification requirements; indicate compliance or noncompliance; in the event of noncompliance, identify documentation that gives reasons for acceptance outside of the specified design).

8. Signature of the CQA Officer.

5.3 FINAL DOCUMENTATION

At the completion of the project, CRA, on behalf of the Respondents, will submit a final report to the U.S. EPA and the WDNR. This report will include all of the daily inspection summary reports, inspection data sheets, problem/corrective action reports, deviations from design and material specifications (with justifying documentation) and as-built drawings. This

document shall be certified correct and will be included as part of the CQA plan documentation.

The final documentation should reemphasize that areas of responsibility and lines of authority were clearly defined, understood, and accepted by all parties involved in the project. Signatures of CRA's Project Manager and CQA Officer shall be included as confirmation that each party understood and accepted the areas of responsibility and lines of authority and performed their functions in accordance with the CQAPP.

Final documentation submitted to the U.S. EPA and the WDNR as part of the CQAPP documentation does not sanction the CQAPP as a guarantee of facility construction and performance. Rather, the primary purpose of the final documentation is to improve confidence in the constructed facility through written evidence that the CQAPP was implemented as proposed and that the construction proceeded in accordance with design criteria, plans, and specifications.

5.4 STORAGE OF RECORDS

During construction, the CQA Officer will keep his/her copy of the Design Drawings and Project Specifications, CQAPP, and originals of all data sheets and reports in his/her possession. A duplicate of this information will be held by CRA in their offices.

Once the RA is complete, all CQA documents (originals) will be kept by CRA. This information will be kept in accordance with the Consent Decree.

6.0 LONG TERM MAINTENANCE

6.1 START UP AND BREAK IN PERIODS

Typically, systems suffer the majority of operating difficulties upon start up and in the following break in period of 3 to 6 months. As each system is Site-specific, so will be the operating characteristics. The system operator will gain operating experience and learn to address this system's operating characteristics.

6.2 INVENTORY

A spare parts inventory of materials and components which are common to system operation and repair will be maintained on-Site. Non-critical parts which are readily available locally and rarely needed will not be stocked.

6.3 EMERGENCY RESPONSE CONTRACTOR

A maintenance and repair contractor able to offer 24-hour available emergency service will be indoctrinated to the system. The contractor will report to the system operator.

All of Which is Respectfully Submitted,

CONESTOGA-ROVERS AND ASSOCIATES

Brian C. Boevers

Charles F. Cooke, P.E.

Miles Phillips

APPENDIX A

CQAPP FORMS

Project #3978

Project: Soil Venting System
CQAPP Form
Wausau Water Supply Site
Wausau, Wisconsin

Unique Sheet #/Date_____

MEETING MINUTES

Meetings will be held on site to ensure that all phases of the remediation are accomplished and that they are completed in accordance with the plans and specifications. Minutes should be taken at all meetings.

Meeting to be held are as follows:

1. Pre Construction Meeting.
2. Daily Meetings (Mornings).
3. Weekly Progress Meetings (The EPA and WDNR are invited to attend).
4. Problem Solving or Deficiency Meetings (see Problem/Corrective Action Report).
5. Prefinal Inspection

Meeting Title: _____

Attendees: _____

Project #3978

Project: Soil Venting System
CQAPP Form
Wausau Water Supply Site
Wausau, Wisconsin

Unique Sheet #/Date_____

INSPECTION (TESTING) DATA SHEET

Inspection data sheets shall include the following information:

1 Description or title of the inspection activity (testing, work task completion, prefinal, final).

2. Location of the inspection activity or location from which the sample increment was obtained.

3. Type of inspection activity; procedure used (reference to standard method when appropriate).

4. Recorded observation or test data, with all necessary calculations.

5. Results of the inspection activity; comparison with specification requirements.

6. Personnel involved in the inspection activity.

7 Signature of the appropriate CQA inspection personnel and concurrence by the CQA Officer.

Items above will be mentioned on this sheet by number so that detail are not overlooked.

[ ] Corrective action required - See corrective action report # _____

(7) _____
CQA Officer

(7) _____
CQA Inspection Personnel

Project #3978

Project: Soil Venting System
CQAPP Form
Wausau Water Supply Site
Wausau, Wisconsin

Unique Sheet #/Date_____

DAILY SUMMARY REPORT

This data sheet should include the following:

Weather (Temp., Wind, etc.): _____

1. Reports on any meetings held , report topics and their results.
2. Construction tasks and locations (by change or grid reference) of construction under way during the time frame of the daily summary report.
3. Descriptions of areas or unit of work (blocks) being inspected and documented.
4. Description of off-site materials received, including any quality verification (vendor certification) documentation.
5. Calibrations, or recalibrations, of test equipment, including actions taken as a result of recalibration.
6. Decisions made regarding approval of units of material or of work (blocks), and/or corrective actions to be taken in instances of substandard quality.
7. Unique identifying sheet numbers of inspection data sheets and/or problem/corrective action reports used to substantiate the decisions described in the preceding item.
8. Signature of the CQA Officer or support.

Items above shall be mentioned on this sheet by number so that details are not overlooked.

(8) _____

CQA Officer

NOTIFICATION OF FIELD MODIFICATION: __

Contract No. 3978( )

Date: _____

Project: Wausau Water Supply Site
SVE Construction
Wausau, Wisconsin

The U.S. Environmental Protection Agency (EPA) and the Wisconsin Department of Natural Resources (WDNR) are hereby notified of the need for a field modification to the work in progress at the above noted project site. These modifications are as follows:

Effect on Construction Schedule:

U.S. EPA/WDNR ON-SITE INSPECTOR

Accepted By: _____

Date: _____, 19____

Accepted By: _____

Date: _____, 19____

CONESTOGA-ROVERS & ASSOCIATES

Recommended By: _____

Date: _____, 199____

cc: WDNR
U.S. EPA
Wausau Distribution List
CRA Office Copy

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☑ Wastewater ☐ Water Resources
☐ Superfund ☐ Other _____

SOIL BORING LOG INFORMATION
Form 4400-122 Rev. 5-92

Page _____ of _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
	_ _ _ _ _ _ _	

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
	M M / D D / Y Y	M M / D D / Y Y	

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
_ _ _	_ _ _ _ _ _ _ _		_____ Feet MSL	_____ Feet MSL	_____ inches

Boring Location
State Plane _____ N, _____ E S/C/N | Lat ° ' "
_____ 1/4 of _____ 1/4 of Section _____, T _____ N, R _____ E/W | Long ° ' "

Local Grid Location (If applicable)
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

County	DNR County Code	Civil Town/City/ or Village
	_ _ _	

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	

State of Wisconsin
Department of Natural Resources

Instructions
Soil Boring Log Information Forms
Form 4400-122, Form 4400-122A
(Rev. 5/92)

General Instructions
Fill out a Soil Boring Log Information form for every boring drilled. Be sure to indicate the page number and boring number in the blanks at the top of each page. All applicable portions of the Soil Boring Log Information Form must be properly completed. The form must be signed. Form 4400-122A must only be used as an attachment to form 4400-122.

Routing
Return this form to the project manager or plan reviewer for the Department program that required the boring. If the project manager/plan reviewer is in a District Office, send the original to the District Office and a copy to the Central Office in Madison. If the project manager/plan reviewer is in the Central Office, send the original form there and a copy to the District Office. If your project does not have a project manager or plan reviewer or you do not know who it is, send the form to the appropriate program in the Central Office.

Check the appropriate box at the top of the form to assure proper routing once the form reaches the Department.

General Boring Information
Facility/Project Name: The name of the landfill, lagoon, surface impoundment, spill or project.

License/Permit/Monitoring Number: The number assigned by the Department. If unknown, leave blank.

Boring Number: The site boring number or name (ie. B-1).

Boring Drilled By: The name of the drilling firm and the name of the drilling crew chief.

Date Drilling Started: The date the boring was started.

Date Drilling Completed: The date the boring was completed.

Drilling Method: The drilling method(s) used (ie. hollow stem auger).

DNR Facility Well Number: Leave blank. The Department will assign this number if needed.

Wisconsin Unique Well Number: Leave blank. The Department will assign this number if needed.

Common Well Name: The site well name if a well was constructed in the boring (ie. MW-1).

Final Static Water Level: The static water level in the borehole in tenths of feet above mean sea level prior to abandonment or well construction.

Surface Elevation: The surface elevation of the ground surface at the borehole in tenths of feet above mean sea level referenced to the closest USGS benchmark.

Borehole Diameter: The diameter of the borehole in tenths of inches.

Boring Location: The location of the boring in State Plane Coordinates or latitude and longitude in degrees, minutes, and seconds. If State Plane Coordinates are used circle the appropriate letter for north, central, or south. Also indicate the quarter-quarter section, township, and range if known.

Local Grid Location: The location of the boring on the local site grid if applicable.

County: The county in which the boring is located.

DNR County Code: The two-digit Department county code. (The code is based alphabetically with Adams County 01 and Wood County 72)

Civil Town/City/or Village: The municipality in which the boring is located.

Boring Log

Sample Number: The number used to identify the sample. Indicate the type of sampling apparatus used (ie. split spoon, Shelby tube). Note the diameter of the sampler in the Comments column.

Sample Length Attempted and Recovered: The length of sample attempted and the length of sample recovered reported in inches.

Blow Counts: The number of blow counts per specified length.

Depth: Indicate the depth of sample collection or any change in the soil or rock type encountered.

Soil/Rock Description and Geologic Origin: List visual characteristics of soil/rock noted during boring along with any pertinent descriptive remarks. Each major soil unit and bedrock formation shall be described using both subsurface investigations and regional information. Indicate likely geologic origin and Munsell color of the material.

USCS: Indicate the Unified Soil Classification System classification of any unconsolidated units encountered during boring.

Graphic Log: Graphically illustrate soil/rock types encountered through the depth of boring and provide a key for the symbols used. Indicate the final depth of the boring on the log, referenced to the USGS datum.

Well Diagram: Graphically show the well casing, well screen length(s), and the location of the top of the filter pack(s) if the boring is converted into a well.

PID/FID: Measurements performed on samples using a Photo-Ionization Detector or a Flame Ionization Detector. Indicate in the comments column the type of detector and the method used.

Soil Properties:

Compressive Strength - Standard measurements in tons/ft^2. Indicate in the comments column the type of test used.

Moisture Content - Laboratory measurements of percent moisture content.

Liquid Limit - Measurement in percent.

Plasticity Index - Measurement in percent.

P 200 - Measurement of percentage of soils smaller than the #200 sieve.

RQD/Comments: Where boring penetrates bedrock, indicate the Rock Quality Designation of the sample. Otherwise, place all comments or remarks in this column and the adjacent margin.