Work Plan and Design Document Interim Remedial Measure: Drain Pipe

Ward Products Corporation
Amsterdam, New York
Site Code 4-29-004

Prepared by:

RETEC ENGINEERING, P. C.

Under Contract To:

ThermoRetec Consulting Corporation
1001 West Seneca Street, Suite 204
Ithaca, New York 14850-3342

ThermoRetec Project No.: NRMD2-02936-300

Prepared for:

Ward Products Corporation
61 Edson Street
Amsterdam, New York 12010

August 31, 1999

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Prepared by:

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August 31, 1999

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Statement of Limitations

Work for this project was performed, and this remedial design prepared, in accordance with generally accepted professional practices for the nature and condition of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Normandeau Associates and Ward Products Corporation for specific application to Ward Products site in Amsterdam, New York. No other warranty, express or implied, is made.

1 Introduction

This document presents the Work Plan and detailed design for the interim remedial measure addressing the former drain pipe at the Ward Products facility in Amsterdam, New York. It has been prepared in accordance with Section V. of the Consent Order (NYSDEC, 1997), and combines the required "Work Plan" and "detailed design specifications" into a single document.

The Report on Remedial Investigations (Normandeau, 1998) identified the drain pipe area as a suspected source for the TCE found in groundwater. Presently, this drain pipe is used only to discharge water from the roof drain. However, it is suspected that the past release of vapor degreasing solvent to the drain pipe may have resulted in some sediments within the drain pipe and some soils below it acting as a continuing source.

This document describes the rationale, general plan, and detailed procedures for first exposing the drain pipe, assessing the condition of the pipe and surrounding soil, and then taking appropriate actions, including pipe cleaning, removal of contaminated soil, and replacement of pipe sections. The Health and Safety Plan and Contingency Plan are provided as appendices.

1.1 Site Description

The site lies in an industrial area on the north side of Edson Street Extension. The site encompasses 8.6 acres and consists

of a large paved parking lot in the western third of the property, a 69,556 square-foot single story building, and a lawn area in the southern and eastern portions of the property. The drain pipe is located in the eastern lawn area and runs from the building to the drainage ditch at the eastern border of the property.

The stratigraphy of the site at the location of the drain pipe consists of a few inches of sod and topsoil followed by stiff glacial till ranging in thickness from 10 to 15 feet. Bedrock lies beneath the till. Nearby groundwater monitoring wells indicate that the depth to groundwater is approximately 10 to 15 feet; however, some perched groundwater may be present in the glacial till at shallower depths.

The Report on Remedial Investigations provides a more complete description of the stratigraphy and hydrogeology, as well as the results of the environmental investigations.

The pipe referred to in the remainder of this document as the "drain pipe" consists of concrete pipe currently used to convey stormwater from the roof drain system of the building to the ditch at the eastern side of the property. Figure 1 shows the approximate location of the drain line. Previous drawings, recent conversations with Ward employees, and a video camera inspection indicate that the pipe consists of approximately 60 feet of 16 inch pipe between the building and an elbow, approximately 40 feet of 24 inch pipe between the elbow and a manhole, and approximately 70 feet of 24 inch pipe between the manhole and the ditch outfall.

Recent photographs are provided in Appendix A. Photographs 1 and 2 show construction of the pipe and that the pipe contains a trace amount of debris which is likely to be present as a result of repair work on the pipe. Photographs 3 and 4 show the manhole and drain pipe area, and photograph 5 shows the ditch outfall.

Recent inspection of the pipe via video camera confirmed the pipe lengths and diameters listed above. The inspection found that the lower section of the concrete pipe has been dissolved (concrete aggregate is visible) and separations up to three

inches wide were observed in the majority of the joints between the four foot long pipe sections. No significant accumulations of sediment were observed during the inspection. Due to the poor condition of the pipe, replacement of the pipe will be considered during the IRM.

1.2 IRM Project Responsibilities

The principal organizations involved in designing, and construction of the IRM at the site will be Ward Products Corporation, NYSDEC, RETEC, Normandeau, and Contractors.

1.2.1 Ward Products Corporation

As the site Owner, Ward is responsible to NYSDEC for the IRM design, construction, and evaluation, in accordance with the Order on Consent. Ward has the authority to monitor and control the quality of construction and related activities to ensure conformance with the engineering design plans and specifications. Ward has the authority to select and dismiss the contractors used to assist them with fulfilling these responsibilities. Ward also has the authority to select and accept or reject design plans and specifications, and materials and workmanship of the contractors and subcontractors.

1.2.2 New York State Dept. of Environmental Conservation (NYSDEC)

NYSDEC will review Ward's remedial designs, plans, and specifications for substantial compliance with the agency's regulations. Any substantial deviations from the requirements or approved design plans and their potential effect on the schedule must be approved by NYSDEC.

1.2.3 RETEC Engineering, P.C.

RETEC is the Engineer responsible for the IRM design. RETEC will also be conducting field engineering during the work and will make recommendations to Ward regarding field decisions during construction. They will prepare the Final Engineering Report.

1.2.4 Normandeau Associates Inc.

Normandeau will provide technical assistance during the project, especially regarding the interpretations of test results and observations made during the excavation and sampling activities.

1.2.5 Contractors

The Contractors referred to in this Work Plan will be selected by Ward from among qualified companies. The Contractors will be responsible for the performance of the work in accordance with the drawings and specifications incorporated in this Work Plan. All Contractors will be given a copy of the Order on Consent and will be required to comply with it as a condition of their contracts.

1.3 Project Approach

The following objectives of the IRM are established for this work:

- **If found to be present, remove soil below the drain pipe that contains substantial TCE and chromium, and could contribute to concentrations of constituents in groundwater. The basis for this objective is described in the Report on Remedial Investigations.**

- **Minimize damage to structures or properties, and minimize interference with the ongoing operation of the Ward Products facility.**

- **Provide an IRM which is technically feasible and financially practicable.**

We anticipate that in at least one location along the pipe, some soil beneath the pipe is more likely to be contaminated than in other areas. A video camera inspection has shown that the majority of joints between the four foot long sections of the 24 inch pipe have separated, in some locations up to three inches wide, and may have allowed leakage from the pipe. The camera surveyed the entire length of the 24 inch diameter pipe and found it to be sediment free. It is likely that the remaining portions of the pipe are in a similar condition, therefore, sediments in the pipe are not likely to pose a threat to groundwater or surface water. The 16 inch pipe which leads from the manhole to the building was found to be of similar construction (concrete pipe).

The final condition of the stormwater drain pipe should allow for passage of stormwater without excessive leakage. The decisions regarding which particular actions should be implemented will be made after first exposing the pipe and assessing its condition; however, this Work Plan addresses all of the actions that may be appropriate, given the anticipated scenario.

The scope of work for the IRM will include the following actions:

- **Exposure of the drain pipe from the outside wall of the building to the ditch outfall. This will involve**

excavation of a trench to allow assessment of the condition of the pipe and the soil immediately below it. The details of this action are described in Section 2 of this Work Plan.

- **Assessment of conditions of the pipe and soil. The pipe and the soil immediately below it will be assessed by field observations of discoloring and odor, field testing with a photoionization detector (PID), and, for some samples, laboratory analyses. This assessment will form the basis for decisions regarding which actions will be taken to complete the IRM. The details of this assessment and the specific decision-making criteria are described in Section 3 of this Work Plan.**

The scope of work then may involve one or more of the following actions:

- **Excavation, transport, and offsite disposal of contaminated soil, if any, from beneath the drain pipe. If contaminated soil beneath the pipe is identified, then that section of pipe will be removed and the contaminated soil beneath will be excavated. The maximum depth of excavation will be the depth to groundwater. The procedures for this removal action are described in Section 4 of this Work Plan.**

- **Cleanout of drain pipe. Portions of the pipe which are intact may be cleaned out to remove sediments, if they are present within the pipe. The pipe will be cleaned in place by plugging the outfall and using a water-jet router and vacuum system to collect the cleanings. The details of this action are described in Section 5 of this Work Plan.**

- **Repair or replacement of pipe. Portions of the pipe may require repair or replacement in order to ensure that stormwater passes through the pipe without excessive**

leakage. The details of this action are described in Section 6 of this Work Plan.

After these actions are complete, the trench will be backfilled to match existing grade.

If at any time during the course of this work the conditions at the site are substantially different than anticipated in this Work Plan, affecting the purpose of the work or the health and safety of the workers or Ward employees, the work area will be returned to a safe condition and work will be temporarily halted. A meeting will then be convened among representatives of NYSDEC, Ward, Normandeau, and RETEC to determine the appropriate actions and modifications to this Work Plan, the Health and Safety Plan. Work will then resume in accordance with the revised plan.

General requirements and specifications for conducting the work are described in Section 7 of this Work Plan.

Design drawings are included in this Work Plan.

1.4 Schedule

The optimal time to conduct this work will be a dry period in late August or in September.

The pipe exposure and assessment activities are anticipated to take approximately 10 working days, including rush laboratory turnaround of soil samples. The mobilization of the contractor for excavation of contaminated soil, if required, will take typically three to seven working days. The duration of the soil excavation activity will depend upon the quantity of soil to be excavated. If a 20 foot long portion of the pipe is affected, we estimate that excavation of the soil beneath this portion would take one day, followed by a period of 10 days for soil profiling and transportation and disposal. The restoration of the drain pipe could take from one to 10 days, depending on the extent of

any breakage or deterioration of the pipe. The clean out of the drain pipe would take one day or less to complete.

2 Exposure of Drain Pipe

2.1 Performance Criteria and Design Basis

Exposure of the drain pipe is the necessary first step in the IRM. It is the best method available for allowing access to the pipe and the soil beneath the pipe. The following performance criteria apply:

1. **The drain pipe is currently used for stormwater flow from the roof drains. Prior to the start of this work, Ward will attach temporary, above-ground piping so that roof drainage does not flow through the drain pipe. This will be reversed after all work is complete.**

2. **Expose the entire length of the pipe from the building to the ditch outfall so that visual observations can be made. Note that an IRM is planned for the area of the transformer to remove PCB impacted soil. This IRM will be completed prior to the drain pipe excavation work.**

3. **Provide access to the soil beneath the pipe so that this soil can be sampled, observed, and analyzed. Soil at the building foundation wall will be sampled to assess soil conditions in this area. If impacted soil is found, soil removal will be limited to a maximum 1:1 slope from the wall footers in accordance with standard geotechnical practice for the protection of the structure.**

4. **Excavate a minimum quantity of soil.**

5. **Excavate only non-contaminated soil in this phase of the work. Stage the soil so that it can be re-used as fill over the pipe. The condition of the soil will be confirmed with one composite sample of the excavated soil pile. Following receipt of the laboratory results indicating non-hazardous conditions, the soil will be returned to the excavation. Any contaminated material that is excavated will be segregated.**

6. **Avoid damaging the pipe and all other structures adjacent to the pipe.**

2.2 Technical Specifications

The Construction Drawings for exposure of the drain pipe are presented in Figure 2 and Figure 3.

2.2.1 General

1. **Contractor shall comply with the health and safety requirements for clean earthwork construction and trenching in accordance with OSHA regulations 40 CFR 1926. Hazardous waste operator requirements do not apply to the contractor for this portion of the work, because no contaminated soil shall be excavated in this portion of the work. If at any time during this portion of the work the Engineer determines that contaminated soil has been encountered and additional OSHA requirements apply, Contractor shall stop work in the affected area. This area will then be assessed in accordance with Section 3, and worked by personnel with proper protective equipment and training in accordance with Section 4.**

2. **Establish locations of the drain pipe and adjacent structures and pipes, including overhead electrical line from the substation to the building and any subsurface utilities in the area of the excavation.**

3. **Contractor shall take all due care to avoid damage to the drainage pipe, adjacent pipes, manhole, overhead electrical line, electrical substation structures, building structures, and all other structures on the property, including all monitoring wells. Known adjacent pipes include:**

   - **A 12 inch pipe at the elbow which historically and currently is used only for rainwater roof drains;**

   - **A six inch pipe intersecting the manhole which historically connected the treatment plant to the sanitary sewer and currently is seldom, if ever, used to drain the floor in this area; and**

   - **A six inch perforated PVC pipe placed over the 24 inch drain pipe near the ditch outfall which has always been used to drain rainwater away from the area of the new warehouse.**

   - **A historic clay four inch or six inch pipe.**

4. **The Contractor shall maintain dust levels below NYSDEC TAGM 4031 requirements (0.15 mg/m^3).**

2.2.2Earthwork

The Contractor's sequence of activities shall be as follows:

1. **Begin pipe exposure excavation at the building and work toward the manhole, then the outfall. Excavate the minimum quantity of soil to allow exposure of the**

top and sides of the pipe. Where possible, without impacting adjacent structures, provide a minimum 1.5 foot, maximum 2.5 foot wide trench on both sides, and a minimum of six inches below the bottom of the pipe to allow Engineer to sample the soil remaining beneath the pipe.

2. **Prior to starting the excavation near the ditch outfall, place and maintain until work is complete, hay bales and silt curtain between the excavation area and the ditch to prevent discharge of silt into the ditch.**

3. **At the direction of the Engineer, remove one or more sections of drain pipe to allow further assessment of the pipe and its contents, or soil beneath the pipe by the Engineer.**

4. **Stage the excavation and backfilling to allow for emergency vehicle access to the electrical substation at all times.**

5. **Place all excavated, non-contaminated material at the side of the trench for use as backfill, unless otherwise requested by Ward.**

6. **Allow for assessment to be conducted by the Engineer as described in Section 3.**

7. **After the assessment, if so directed by the Engineer, place excavated non-contaminated soil as backfill in locations directed by the Engineer. From the bottom of the trench to the top of the pipe, compact fill in six inch lifts using methods which will not damage the pipe such as plate tamping or backhoe bucket tamping. From the top of the pipe to the existing grade, compact fill in one foot lifts using backhoe bucket tamping.**

8. **Ward will restore surface with topsoil and seed for grass.**

3 Assessment of Conditions

The assessment of conditions will be done by RETEC in consultation with NYSDEC, Normandeau, and Ward. We anticipate that this will be done concurrently with the exposure of the drain pipe. After a section of pipe has been exposed and the backhoe has moved ahead, RETEC will measure the depth of the trench, take precautions in accordance with Health and Safety Plan, and assess the pipe and soil conditions, as described in this Section.

3.1 Assessment of Pipe Conditions

In addition to the exposure provided by the excavation described in Section 2, a hand shovel will be used to expose each joint, the area beneath each joint and a minimum of one area in the middle of each pipe section. The exposed pipe will be examined for breakage, deterioration of the concrete and reinforcement, and misalignment of the joints, as defined by an opening of 1/4 inch or more. If breakage or deterioration has occurred which could result in leakage, then the affected section of pipe will be restored in accordance with Section 6. If misalignment of the joints has occurred, then the affected sections will be realigned prior to backfilling.

3.2 Assessment of Soil Conditions

The assessment of soil conditions will focus on residual Volatile Organic Compounds (VOCs) that would likely be present in soils directly beneath the pipe at points where accidental releases occurred in the past.

The following procedure will be used:

1. **Test pit excavation logs will be prepared for the soil adjacent to and beneath the pipe. Any discoloration or signs of erosion will be observed and recorded. Soil odors will be observed and recorded.**

2. **A photoionization detector (PID) will be used as a screening tool to assess the environmental quality of the soils. The PID used will have a 10.6 eV bulb for detection of TCE, DCE, and vinyl chloride in accordance with the ionization potential of these compounds. Grab samples of soils from beneath the pipe will be obtained near each joint and near the midpoint of each section. Grab samples will be obtained from any areas of breakage or deterioration. Jar headspace PID readings will be obtained from all of these samples.**

3. **If PID readings greater than 20 ppm are obtained, then the soil from that location will be subjected to laboratory analysis. This level of screening will indicate substantial TCE concentrations that would be associated with the source material, while avoiding many false positives from the PID due interferences from water vapor. The PID will be standardized with isobutylene gas (100 ppm). A minimum of five soil samples will be subjected to laboratory analyses, even if no PID readings greater than 20 ppm are obtained. Laboratory analyses will consist of VOCs by EPA Method SW-846-8260A and for chromium by EPA Method SW-846 7190. Note that, upon receipt of the laboratory analyses, the results will be reviewed and, if warranted for disposal purposes, the samples will be analyzed for TCLP VOC and / or TCLP chromium analyses.**

4. **If laboratory analyses confirm the presence on VOC contamination in soils at concentrations greater than NYSDEC TAGM 4046 guidance values, then limited soil excavation will be conducted as described in Section 4. The TAGM 4046 value for TCE is 700 µg/kg. The laboratory analysis and mobilization of the pre-selected contractor to the site typically will take between three and seven working days.**

5. **Sections of pipe which have no contaminated soil beneath, as confirmed by laboratory analyses, and have been restored or realigned, as necessary, will be backfilled in accordance with the specification in Section 2.**

4 Removal of Contaminated Soil

4.1 Performance Criteria and Design Basis

Excavation, transportation, and offsite disposal of contaminated soils located beneath the drain pipe will decrease the quantity of source material available for adverse impacts to groundwater quality. The following performance criteria apply:

1. **Excavate soil located beneath the drain pipe which contains VOCs at concentrations greater than the TAGM 4046 guidance values.**

2. **Excavate soil to a maximum depth of the depth to groundwater as evidenced by groundwater seepage into the excavation. The soil type in the vicinity of the pipe had been determined to be a glacial till material. Sloughing of the trench walls is unlikely to occur; however, if sloughing impedes the progress of the work, the contractor will widen the trench accordingly. Sampling personnel will not enter the trench after the trench is excavated to a depth greater than four feet. Sampling of soil at depths greater than four feet will be accomplished by collecting soil directly from the backhoe bucket.**

3. **Excavation will be limited to the soils beneath the drain pipe. Excavate soil to a maximum width and length related to the stability of the excavated trench sidewalls**

and the stability and structural integrity of adjacent structures, including the Ward Products building and the electrical substation. If the trench sidewall samples indicate high concentrations of constituents, then additional excavation may be considered in a separate action after groundwater and soil investigations and actions have been evaluated.

4. **Segregate excavated soils to minimize the cost of transport and disposal.**

5. **Avoid damaging the pipe and all other structures adjacent to the pipe.**

6. **Collect sidewall and bottom samples for laboratory analyses to document the quality of soils remaining. The sample frequency will be to collect a set of one bottom sample and a sample from each sidewall for every 10 linear feet of trench. PID headspace measurements will be recorded at each sampling location.**

4.2 Technical Specifications

The Construction Drawing for a typical excavation of soil located beneath the drain pipe is presented in Figure 4.

4.2.1 General

1. **Contractor shall comply with the health and safety requirements for earthwork construction and trenching in accordance with OSHA regulations 40 CFR 1926, as well as the hazardous waste operator requirements of 40 CFR 1910 and the IRM Health and Safety Plan incorporated into this IRM Work Plan.**

2. **Establish locations of the drain pipe and adjacent structures and pipes, including overhead electrical line from the substation to the building and any subsurface utilities in the area of the excavation.**

3. **Contractor shall take all due care to avoid damage to the drainage pipe, adjacent pipes, manhole, overhead electrical line, electrical substation structures, building structures, and all other structures on the property, including all monitoring wells. Known adjacent pipes include a 12 inch pipe at the elbow, a six inch pipe intersecting the manhole, and a six inch pipe placed over the 24 inch drain pipe near the ditch outfall.**

4. **The Contractor shall maintain dust levels below NYSDEC TAGM 4031 requirements.**

In the Technical Execution Plan referred to in Section 8 (and to be approved by RETEC), the Contractor shall describe the equipment and methods to be used for excavation, staging and transportation of materials, and the locations and names of the trucking companies to be used.

4.2.2 Earthwork and Pipe Placement

The Contractor's sequence of activities shall be as follows:

1. **Prior to starting excavation near the ditch outfall, place and maintain until work is complete, hay bales and silt curtain between the excavation area and the ditch to prevent discharge of silt into the ditch.**

2. **Remove one or more sections of drain pipe, as identified by the Engineer, to allow excavation of the affected soil beneath the drain pipe. Place the drain pipe sections on a double-layer of plastic sheeting and tie down a cover of plastic sheeting to prevent rain from contacting the**

pipe and then draining to the ground. If requested by the Engineer, steam clean the pipe.

3. **Stage the excavation and backfilling to allow for emergency vehicle access to the electrical substation at all times.**

4. **Excavate the area identified by the Engineer. Maintenance of excavation sidewalls shall be the responsibility of the Contractor. As the excavation proceeds, it may be necessary for the Contractor, at the Engineer's request, to control compounds or odors which are released due to the Contractor's activities. Either the rate of excavation shall be reduced or engineering controls such as polyethylene sheeting shall be used as necessary to cover the exposed materials.**

5. **Segregate three types of soil identified by the Engineer: a) possibly non-contaminated soil which can be used as backfill after testing confirms that it is not contaminated; b) contaminated soil that may not be RCRA hazardous and will be disposed of as non-hazardous solid waste after testing confirms this; and c) contaminated soil that is suspected of being RCRA hazardous and can be disposed of as hazardous waste after testing confirms this. Place each of these soil types in separate sections of a double-layer of plastic sheeting. At the end of each work day, cover and tie down with plastic sheeting to prevent rain from contacting the soil and then draining to the ground.**

6. **Allow for sidewall and bottom samples to be conducted by the Engineer.**

7. **Decontaminate equipment in accordance with Section 7.4.3.**

8. **The excavation shall then be backfilled with clean excavated soils identified by the Engineer and clean run-of-bank gravel provided by the Contractor. The gravel shall be compacted with an excavator bucket to two feet below the bottom of the drain pipe elevation. Compact the next two feet in six inch lifts using backhoe bucket tamping.**

9. **Place drain pipe in the trench. If requested by the Engineer, use the pipe previously removed, and repair pipe joints to form water tight joints with the adjacent pipe sections. If not, use new drain pipe of similar dimension with suitable couplings, as described in the Technical Execution Plan and approved by the Engineer, so as to form water tight joints with the adjacent pipe sections.**

10. **From the bottom of the trench to the top of the pipe, compact fill in six inch lifts using backhoe bucket tamping. From the top of the pipe to the existing grade, compact fill in one foot lifts using backhoe bucket tamping.**

11. **Ward will restore surface with topsoil and seed for grass.**

4.2.3 Profiling, Transportation and Disposal

Impacted materials may include soil, debris, and pipe, as identified by the Engineer. The Contractor shall profile, manifest, and transport these to offsite disposal facilities designated by Ward Products. Ward Products will contract directly with the disposal facilities to be used. The disposal facility will be properly permitted to dispose of the waste. The names and locations of these facilities will be provided to potential Contractors in the Invitation to Bid.

Immediately following the completion of these activities, the Contractor shall remove all equipment, PPE, plastic sheeting, and other materials so that the work area is restored to a neat condition.

5 Cleanout of Drain Pipe

5.1 Performance Criteria and Design Basis

A recent video inspection of the 24 inch diameter portion of the drain pipe was completed to assess the condition of the pipe and to determine the amount of sediments present. The inspection found that the pipe was sediment-free and, therefore, does not need cleaning. Although it is unlikely that any of the remaining portions of the pipe needs cleaning, a description of the cleaning process and a discussion of the management of any waste found is included in the Work Plan should sediments be found in areas not inspected with the video camera.

The cleaning work, if necessary, will be conducted to prevent continuing releases of contaminants, portions of the pipe which are intact will be cleaned out to remove material present within the pipe. This may be done after the pipe is exposed and assessed. The following criteria apply:

1. **Effectively remove the sediment in the pipe.**
2. **Use non-destructive cleaning techniques.**
3. **Use a controlled removal process which does not release the sediment to the environment.**

5.2 Technical Specifications

1. **The Contractor shall follow their health and safety precautions for use of their equipment. The Contractor's workers shall not be in direct contact with the sediment or wash water, and shall be assisted by the Engineer to perform this work.**

2. **The pipe shall be cleaned in place by plugging the outfall and using a jet router and vacuum system to collect the cleanings.**

3. **Cleanings collected in the vacuum truck shall be emptied onto a double layer of plastic sheeting to allow for drying.**

4. **After drying, the cleanings will be tested and properly disposed of by Ward Products. Pipe cleaning water will be tested and properly disposed of by the pipe cleaning contractor.**

6 Repair or Replacement of Drain Pipe

6.1 Performance Criteria and Design Basis

Portions of the pipe may require repair or replacement in order to ensure that stormwater passes through the pipe without excessive leakage. If contaminants were present in the soil, such leakage could increase the downward movement of the contaminants and could be potentially detrimental to groundwater quality.

The portions of the pipe requiring this work will be identified by the assessment of pipe conditions as described in Section 3.

6.2 Technical Specifications

1. **Contractor shall comply with the health and safety requirements for clean earthwork construction and trenching in accordance with OSHA regulations 40 CFR 1926. Hazardous waste operator requirements do not apply to the contractor for this portion of the work, because no contaminated soil shall be excavated in this portion of the work. If at any time during this portion of the work the Engineer and / or Site Health and Safety Officer determines that contaminated soil has been encountered and additional OSHA requirements apply,**

Contractor shall stop work in the affected area. Workers with proper 40 hour HAZWOPER training will complete the work.

2. **Repair pipes identified by the Engineer. Use standard concrete repair materials applied in accordance with manufacturer's instructions.**

3. **Replace pipes identified by the Engineer. Use replacement pipe and backfill as specified in Section 4.2.2.**

7 General Requirements

This section describes the general requirements for conducting the work, including health and safety requirements, quality assurance, the Technical Execution Plan, environmental monitoring and control, and project reporting.

7.1 Health and Safety

A health and safety plan (HASP) for the Engineer's activities for this project is provided under separate cover as Appendix B. Additional health and safety plans shall be prepared by the Contractor responsible for the work described in Section 4 prior to the start of work. It shall satisfy the requirements of industry standards for work at hazardous waste sites (29 CFR 1910.120), standards for the construction industry (29 CFR 1926), general industry standards (29 CFR 1910), and standards for specific hazardous materials (29 CFR 1900.1000). Subjects covered in the HASP shall include:

- **Health & Safety Risk Analysis**
- **Personal Protective Equipment**
- **Air Monitoring & Action Levels**
- **Site Control**
- **Decontamination**
- **Emergency Response Plan**
- **Lockout/Tagout**
- **Heavy Equipment Operations**
- **Excavation and Trenching**
- **Material Safety Data Sheets**

- **Health and Safety Records and Reports**

The Engineer will make available to this Contractor for review a copy of the Engineer's HASP. The Contractor's HASP shall be at least as stringent as the Engineer's.

Prior to the work, this Contractor shall provide to the Engineer evidence (photocopies) of the following items for each person who will be entering the work zone:

- **Respirator fit test**
- **OSHA 40 hour training or 8 hour refresher training**
- **Annual physical**

Persons without these items both on file and up-to-date with the Engineer will not be allowed to enter the work zone.
Hours of operation shall be daylight hours between 8 AM and 5 PM, Monday through Friday, unless otherwise allowed in writing by Ward.

7.2 Quality Assurance

This work will utilize the quality assurance procedures established in the Remedial Investigation Work Plan (Normandeau, 1997). We anticipate using Adirondack Laboratories, the laboratory used for the Investigation, with ASP short form deliverables.

7.3 Technical Execution Plan

A Technical Execution Plan shall be prepared by the Contractor(s) during the bidding process for this work and submitted with the Contractor(s)' bid for the Engineer's review and for Ward's approval. It shall describe the materials, equipment, methods, and schedules to be used to perform the work. It shall provide resumes of key project personnel. It shall provide the names, addresses, contact persons, and other

information relevant to the Contractor's proposed trucking subcontractors for hazardous and non-hazardous solids. The selected Contractor(s) may be required by the Engineer to provide additional clarifications to their Plan prior to and during the course of the work.

7.4 Environmental Monitoring and Control

Environmental monitoring and mitigation procedures will be followed to manage impacts during construction and to control fugitive emissions.

7.4.1 Erosion and Sedimentation Control

The Contractor shall comply with the following erosion and sedimentation control measures:

- **All work will be conducted in such a manner as to minimize the disturbance of vegetated areas in order to prevent erosion.**
- **All erosion and sedimentation control will be continuously inspected and maintained.**
- **All disturbed areas will be graded to promote sheet flow of run-off water and to prevent erosion.**
- **Erosion caused by site work will be repaired immediately.**
- **Seeding (to be done by Ward) will be completed soon after remediation is completed.**

7.4.2 Dust, Vapor, and Odor Monitoring

In accordance with 29 CFR 1910.120(h), an onsite air monitoring program will be implemented by the Engineer to identify and quantify airborne levels of hazardous substances to determine the appropriate level of employee protection required for personnel working on site.

In addition to the work area monitoring program, the Engineer will monitor community air quality upwind and downwind of the work area to provide real-time estimates of total hydrocarbons, odor and particulate releases to the community as a result of remedial activities.

Methods for monitoring work area air quality are addressed in the Engineer's HASP, and include the use of a PID, compound-specific Draeger tubes for TCE and vinyl chloride, and a MiniRam monitor for real-time dust monitoring. The PID used will have a 10.6 eV bulb for detection of TCE, DCE, and vinyl chloride in accordance with the ionization potential of these compounds. Measurements of these air quality parameters will be made at least once every two hours.

The results of the monitoring will be used by the Engineer to ensure that all action levels outlined in the HASP are followed. As the IRM proceeds, it may be necessary for the Contractor, at the Engineer's request, to control compounds or odors which are released due to the Contractor's activities. Either the rate of excavation shall be reduced or engineering controls such as polyethylene sheeting shall be used as necessary to cover the exposed materials.

7.4.3 Mobilization, Demobilization, Decontamination

Ward will provide designated equipment lay down areas to the Contractor. The Contractor shall confine their operations to the areas designated by Ward.

During the remedial activities, the work areas shall be secured and barricaded (temporary fencing, cones and, caution tape) to ensure the safety of the Ward facility workers, visitors, and Contractor's personnel.

During the course of this work, the Contractor shall :

- **Avoid (or repair at no cost to Ward) damage to existing structures, and**
- **Avoid adverse effects to human health and the environment.**
- **Contractor shall not disrupt or hinder the work of others.**
- **All work shall be conducted in accordance with all OSHA and local regulations.**
- **Trucking of all materials both on and off site shall be done in accordance with applicable DOT standards. Trucks hauling materials to and from the site shall use only designated haul roads and shall ensure that the remedial activity does not conflict with other Ward operations.**
- **Equipment and personnel which come in contact with impacted materials shall be cleaned prior to demobilization from the site. Equipment decontamination procedures shall consist of a steam cleaning to the Engineer's satisfaction on a decontamination pad with a sump.**
- **All decontamination water shall be containerized on site. Prior to transport and disposal, the water shall be tested by the Contractor according to the acceptance criteria of the Contractor's receiving facility.**

- **Soil collected on the decontamination pad shall be combined with other excavated soil and disposed of at the Contractor's receiving facility.**

- **Small quantities of visibly contaminated PPE, plastic and miscellaneous materials shall be containerized, tested by the Contractor, and shipped off site to the Contractor's receiving facility.**

7.5 Project Reporting

During the course of the work, the Contractor shall regularly provide to the Engineer:

- **Daily field logs and cost sheets;**
- **Weekly progress reports;**
- **Equipment and material testing records, including analytical results; and**
- **Weigh tickets.**

During the course of the work, the Engineer shall regularly provide weekly Progress Reports to Ward and NYSDEC which will include:

- **The previous week's actions;**
- **Next weeks's planned actions;**
- **Sampling and analytical results;**
- **Design changes and other modifications to the Workplan; and**
- **Revised project schedules.**

Upon completion of the IRM activities, the Engineer will prepare a Final Engineering Report, approved by a professional engineer licensed in the state of New York. The following items will be included in the report:

- **A description of all field work;**
- **As-built drawings;**
- **All pertinent analytical results;**
- **Copies of the bills of lading and manifests from the disposal of materials; and**
- **Status of the site upon completion.**

An IRM Operation & Maintenance Plan will not be applicable to this IRM, as there are no operational activities associated with this IRM.

8 References

Normandeau Associates, Inc., 1997. Remedial Investigation Work Plan, Ward Products Corporation, June, 1997.

Normandeau Associates Inc., 1998. Report on Remedial Investigations, Ward Products Corporation, October, 1998.

State of New York, 1997. Order on Consent, Ward Products, Inc. Index # w4-0762-96-06, Site Code #4-29-004.

APPENDIX A

Photographs