APPENDIX D

Statement of Work for implementation of the Remedial Design, Remedial Action, and Operation and Maintenance

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STATEMENT OF WORK FOR THE REMEDIAL DESIGN AND REMEDIAL ACTION AT CITY DISPOSAL CORPORATION LANDFILL SITE DANE COUNTY, WISCONSIN

I. PURPOSE

The purpose of this Statement of Work (SOW) is to describe the implementation of the remedial action set forth in the Record of Decision (ROD), which was signed by the Regional Administrator for the United States Environmental Protection Agency (U.S. EPA), Region 5, on September 28, 1992, for the City Disposal Corporation Landfill Site (Site). The Respondents shall follow the ROD, this SOW, the approved Remedial Design Work Plan, the approved Remedial Action Work Plan, U.S. EPA Superfund Remedial Design and Remedial Action Guidance and any additional guidance provided by U.S. EPA in submitting deliverables for, designing, and implementing the remedial action at the City Disposal Corporation Landfill Site.

II. DESCRIPTION OF THE REMEDIAL ACTION/PERFORMANCE STANDARDS

Respondents shall design and implement the Remedial Action to meet the performance standards and specifications set forth in the ROD and this SOW. Performance standards shall include cleanup standards, standards of control, quality criteria and other substantive requirements, criteria or limitations set forth in the ROD and all chemical-specific and action-specific Applicable or Relevant and Appropriate Requirements (ARARs) for this Site.

1. Site Security

Respondents shall fence the Site in order to prevent access and vandalism to the Site remedy components. Fencing shall consist of a minimum six-foot high chain link perimeter fence with a minimum three-strand barbed wire. The location of the fence shall be described in the Remedial Design Work Plan. Warning signs shall be posted at 200-foot intervals along the fence and at the gate. The warning signs shall advise that the area is hazardous due to chemicals in the soils and ground and surface waters which pose a risk to public health through direct contact with soils, ground water and surface water. The signs also shall provide a telephone number to call for further information. The fence shall be installed within 20 days after installation of the landfill cap. The Remedial Action Work Plan, to be submitted pursuant to Section III, Task 3, shall provide further details of access restriction measures to be utilized during the construction phase.

2. Restrictive Covenants/Deed Restrictions

Within 15 days after the effective date of the Order, Owner Respondent, Waste Management of Wisconsin, Inc., shall execute and record with the Dane County Recorder's Office the restrictive covenants set forth in Appendix D of the Order.

3. Installation, Construction and Operation of Containment/ Extraction/Treatment System(s) for Remedial Action

A. Landfill Cover

Respondents shall install a landfill cover ("Cap") which shall be designed and installed to meet or exceed the requirements of RCRA Subtitle D and Chapter NR 504.07, Wisconsin Administrative Code ("WAC"). The Cap shall include 2 multi-layer components; a hazardous waste cover over landfill cells 6 and 12, and a solid waste cover over the remainder of the Site.

1. Cap over Landfill Cells 6 & 12

The multi-layer Cap for landfill cells 6 and 12 shall be designed and installed to meet or exceed the requirements of Chapter NR 660.16, WAC.

2. Cap over Remainder of Landfill

The multi-layer cover for the remainder of the landfill, other than landfill cells 6 and 12, shall be designed and installed to meet or exceed the requirements of Chapter NR 504.07, WAC.

B. Landfill Gas Recovery and Treatment System

Respondents shall install a landfill gas recovery and treatment system to control landfill gasses. The landfill gas recovery and treatment system shall be designed and installed to comply with applicable substantive provisions of Chapters NR 400 and NR 500, WAC, including but not limited to, Chapters NR 445, NR 504.04(4)(e) and (f), NR 504.05(7) and (8), NR 506.07(3), NR 506.08(6), NR 508.04(2) and NR 514.07 and NR 516.

Respondents shall prepare and submit a Landfill Gas Evaluation Plan in the Pre-design Work Plan specifying the methodology and procedures to be used in estimating the volume of landfill gasses to be controlled by the landfill gas recovery and treatment system, and outline how the landfill gas recovery and treatment system shall attain compliance with the applicable substantive provisions noted

in the preceding paragraph.

Air emissions from the landfill gas recovery and treatment system shall attain substantive portions of applicable Federal and State standards, including but not limited to, National Ambient Air Quality Standards (NAAQS) for particulate matter (PM-10) under Section 107 of the Clean Air Act, applicable National Emissions Standards for Hazardous Air Pollutants under Section 112(i) of the Clean Air Act, 42 U.S.C. 7412 ("NESHAP") and applicable provisions of Chapter NR 445, WAC.

C. Ground Water Extraction/Treatment System

Respondents shall design, install, and operate a ground water extraction/treatment system to remove ground water that exceeds the ground water cleanup standards and to prevent further migration of contaminated ground water. The ground water extraction/treatment system also shall be designed to ensure that ground water cleanup standards, listed in Table A, are achieved and maintained outside and downgradient of the point of compliance. If additional compounds are detected in the ground water above Wisconsin preventative Action Limits (PALS) and/or Maximum Contaminant Levels (MCLs) as established in the Safe Drinking Water Act, 42 U.S.C., parts 300 f to j, or health-based standards during any monitoring event, those compounds shall be added to Table A as ground-water cleanup standards.

The edge of the landfilled waste is the point of compliance, as that term is used within the National Contingency Plan as found on page 8753 of the March 8, 1990 Federal Register, for the ground water cleanup standards. In order to monitor and evaluate the remedial actions throughout the Site, certain ground water monitoring wells shall be selected to measure compliance with the ground water cleanup standards. The wells used as compliance points shall be identified by Respondents in the Pre-design Activity Report and must be approved by U.S. EPA, in consultation with the State. The selected compliance points must, at a minimum, ensure that cleanup is achieved throughout the contaminated plume. U.S. EPA may require the installation of additional monitoring wells in measuring compliance with ground water cleanup standards.

The extraction/treatment system shall consist, in part, of a network of wells designed to completely capture and contain contaminated ground water within the point of compliance. Respondents shall operate the extraction/treatment system until the ground water cleanup standards are attained outside the point of compliance. The extraction wells,

which comprise the extraction portion of the system, shall be designed to pump sufficient quantities of ground water to capture and extract the entire contaminated plume outside the point of compliance.

Extracted ground water shall be pumped to the ground water treatment system for removal of contaminants prior to subsequent discharge to Badfish Creek. The cleanup standards that the Respondents must achieve prior to discharge of the treated ground water to Badfish Creek ("Effluent Discharge Cleanup Standards") are discussed in Table B.

Respondents shall treat the extracted ground water by chemical oxidation or other comparable technology treatment system. U.S. EPA, in consultation with the State, shall determine when a treatment technology is comparable to chemical oxidation. Air emissions from the treatment process shall attain substantive portions of Federal and State standards, including but not limited to, NAAQS for particulate matter (PM-10), NESHAPs, and provisions of Chapter NR 445, WAC.

Respondents may terminate operation of the extraction/treatment system only with the written approval of U.S. EPA. Respondents may petition U.S. EPA to modify the operation of the extraction/treatment system based on consideration of factors such as attainment of ground water standards outside the point of compliance or performance data from the system indicating that performance standards can be met under other operating conditions. Respondents shall monitor the system's performance on a regular basis, at a frequency to be determined during the Remedial Design. U.S. EPA may require adjustments to the system as warranted by the performance data collected during operation.

If ground water monitoring data, based upon any one monitoring event in a downgradient well outside the point of compliance, show that the concentration of any contaminant has exceeded the ground water cleanup standard outside the point of compliance, Respondents shall modify the extraction/treatment system to achieve the cleanup standard. In the event of an exceedance, Respondents shall notify U.S. EPA and resample the well(s) to confirm the result. In such event, Respondents shall submit a plan within 30 days of exceedance for U.S. EPA approval indicating modifications proposed.

If effluent monitoring data indicate a failure to attain discharge standards following ground water treatment, Respondents shall notify U.S. EPA within 24 hours. U.S. EPA may require adjustments to the treatment system as

warranted by the effluent end of pipe data at Badfish Creek collected during operation.

During operation of the ground water extraction/treatment system, U.S. EPA may require modifications to the system or its operation. These modifications may include any or all of the following:

- at individual wells where cleanup standards have been attained, pumping may be discontinued;

- alternating pumping at wells to eliminate stagnation points;

- pulse pumping to allow aquifer equilibration and to allow adsorbed and/or absorbed contaminants to partition into ground water; and

- installation of additional extraction wells to facilitate or accelerate cleanup of the contaminant plume.

Respondents may petition U.S. EPA to terminate operation of the ground water extraction/treatment system after demonstrating that the ground water cleanup standards have been attained throughout the entire contaminated plume. The demonstration shall consist of three consecutive years of semi-annual monitoring, during which no contaminants exceeded the relevant cleanup standard in any of the wells in the monitoring network. Upon U.S. EPA's approval of the petition, Respondents may terminate operation of the ground water extraction/treatment system.

If ground water monitoring indicates that the concentration of any contaminant has increased above the ground water cleanup standard after the extraction/treatment system has been terminated, Respondents shall reactivate all or a portion of the system, in accordance with direction from U.S. EPA. Indication of an exceedance of a ground water cleanup standard shall be based on one monitoring event in any well within or downgradient of the source area. In the event of an exceedance, Respondents shall immediately resample the well(s) to confirm the result.

If after fifteen years of operation of the extraction/treatment system attainment of ground water standards outside the point of compliance has not been achieved, Respondents shall have the right to notify U.S. EPA as to the possibility of technical impracticability in attaining such ground water standards. Respondents may terminate operation of all or portions of the extraction/treatment system only with the written approval

of U.S. EPA.

D. Extraction and Treatment of Volatile Organic Compounds from Sub-Soils

Respondents shall design, install, operate, and maintain an In-situ Vapor Extraction (ISVE) system and treatment system to remove and treat Volatile Organic Compounds (VOCs) from sub-soils in landfill cells 6 and 12. Respondents shall investigate and propose optimum placement points for vapor extraction wells for U.S. EPA approval prior to placement. Respondents proposed extraction well locations will be an element of Section III, Task 2A, (Preliminary Design), of this SOW. Respondents shall operate and maintain the ISVE systems for at least two (2) years following its installation in accordance with Task 4, Remedial Action/Construction until termination requirements in Section II.3.D.iv are met.

i. Determination of Soil-Gas Concentration

Respondents shall determine the soil-gas concentration of the VOCs in the sub-soils during ISVE pilot testing activity within landfill cells 6 and 12. Respondents shall submit an ISVE Soil Gas Field Sampling Plan and Quality Assurance Project Plan (QAPP) to U.S. EPA for approval. The ISVE Soil Gas Field Sampling Plan shall include, at a minimum: the duration and frequency of sampling activity, the vertical and horizontal locations of sampling, the method of sampling and analysis, the parameters to be analyzed, and the methodology for computing the final soil-gas concentration for each VOC. Upon approval of the ISVE Soil Gas Field Sampling Plan and QAPP by U.S. EPA, in consultation with the State, Respondents shall implement the sampling and testing required under the ISVE Soil Gas Field Sampling Plan.

Respondents shall prepare and submit a Soil-Gas Concentration Report, which details the results of the field sampling and monitoring analysis during the ISVE pilot study. The Report shall document the soil gas concentration of each VOC in the waste and sub-soils at landfill cells 6 and 12. Respondents shall submit to U.S. EPA, upon request, all test results and underlying data compiled pursuant to the Field Sampling Plan.

During the course of the ISVE system implementation, if either Respondents or U.S. EPA determines that the removal of VOCs can be enhanced by innovative pumping techniques, such as pulsing, U.S. EPA may, at its option, require Respondents to operate the system in that manner.

ii. ISVE Off-Gas Treatment

Respondents shall treat off-gas emitted from the extraction wells in order to meet the requirements of the Chapter NR 440-499, WAC, ("Control of Hazardous Pollutants") and the federal Clean Air Act. Respondents shall submit to U.S. EPA for approval an air emission monitoring program, specifying the frequency, duration, and compounds to be analyzed.

Respondents shall ensure proper handling, treatment, and disposal of all waste generated as a result of the off-gas treatment in accordance with all ARARs.

iii. Notification of Temporary ISVE Shutdown

Respondents shall notify U.S. EPA and the State within twenty-four (24) hours of any interruption or stoppage of the ISVE system, whether due to mechanical failure, human error, or any reason (except for routine maintenance, discussed below). Such notification may initially be given orally, but must be confirmed in writing within five days after the date of oral notification. Respondents shall inform U.S. EPA and the State in any such notification of the nature and cause of the interruption or cessation of operation, as well as, the estimated time period before operation of the ISVE system resumes.

Respondents shall notify in writing U.S. EPA and the State forty-eight (48) hours prior to any temporary interruption of the ISVE system's operation necessary to perform routine maintenance (i.e., replace parts or any other required maintenance). Respondents shall inform U.S. EPA and the State in any such notification of the nature of the maintenance to be performed, as well as, the estimated time period before operation of the ISVE system resumes.

In all cases where there is an interruption or cessation in the ISVE system's operation, Respondents shall use their best efforts to promptly resume operation of the ISVE system.

iv. Termination of Operation

Respondents may terminate the operation of the ISVE system only after making written request to U.S. EPA and only after receiving the express written approval of the U.S. EPA, in consultation with the State, to make such termination. Respondents shall submit to U.S. EPA a state-of-the-art model for VOCs identified in the soil and groundwater to provide data on which to base soil-gas cleanup levels necessary to achieve and maintain protective levels of VOCs in the ground water. Respondents shall submit to U.S. EPA

the assumptions made for and the data used to develop the model.

Upon U.S. EPA approval of the proposed model derived soil-gas cleanup goals, Respondents shall operate the ISVE system at full-scale for a minimum of two years. If after two years of operation of the ISVE system attainment of previously approved soil-gas cleanup goals has not been achieved, Respondents shall have the right to notify U.S. EPA as to the possibility of technical impracticability in attaining such goals, and to suggest revised soil-gas cleanup goals. Respondents may terminate operation of all or portions of the ISVE system only with the written approval of U.S. EPA.

Following U.S. EPA approval for termination of all or portions of the ISVE system, Respondents shall remove all equipment used at the Site in connection with the terminated portion of the ISVE system. Respondents also shall fill and grade all well extraction points, trenches, and any other excavations prepared in connection with operation of the ISVE system.

4. <u>Installation and Operation of Monitoring Programs for Remedial Action</u>

Respondents shall implement monitoring programs to evaluate and ensure that the construction and implementation of the Remedial Action complies with approved plans, design documents, and performance standards. Respondents shall submit proposed monitoring programs to U.S. EPA as part of the Remedial Design Work Plan, which shall address the specific components of the Remedial Action. Respondents shall analyze each monitoring sample for a list of parameters that shall be determined during design, subject to approval by U.S. EPA, in consultation with the State.

A. Ground Water Monitoring Program

Respondents shall implement a ground water monitoring program as identified in the Remedial Design (RD) Work Plan or as required by U.S. EPA. The ground water monitoring program shall be designed to: (1) detect changes in the chemical concentration of the ground waters at and adjacent to the Site; and (2) detect the presence and concentration of site-related contaminants in residential drinking water wells near the Site.

Within 30 days of U.S. EPA approval of the RD Work Plan, Respondents shall commence sampling of the monitoring wells identified in the approved RD Work Plan on a quarterly basis, and shall analyze the samples for the parameters

listed in the approved RD Work Plan.

Respondents shall establish a baseline for chemical constituents of concern at each compliance point by sampling and analyzing the ground water at all locations identified in the Pre-design Work Plan. The ground water samples shall be analyzed for parameters including, but not limited to, all compounds on the U.S. EPA's Target Analyte List (TAL) of inorganics, all compounds on U.S. EPA's Target Compound List (TCL) of organics, and Tetrahydrofuran (CAS No. 109-99-9). Upon completion of this initial sampling effort, Respondents shall present to U.S. EPA a selected list of TALs and TCLs for analysis and a list of monitoring wells for long term monitoring. During construction and operation of the Remedial Action, Respondents shall sample and analyze the ground water on a quarterly basis at the locations selected during the initial sampling round and approved by U.S. EPA. The ground water samples shall be analyzed for selected TALs, selected TCLs, and Tetrahydrofuran. Residential well sampling and analysis for Tetrahydrofuran, TAL analytes, and TCL analytes shall occur at a minimum frequency of twice a year.

Residential well sampling shall commence within thirty (30) days after the effective date of this Order. Residential well sampling shall be conducted during design of the remedy, using standard drinking water well sampling and analytical procedures until site specific procedures are approved by U.S. EPA. U.S. EPA shall select residential wells downgradient of the Site for sampling and analysis during the remedial design until a list of residential wells is approved by U.S. EPA for long-term monitoring.

After terminating the operation of the ground water extraction/treatment system, Respondents shall continue ground water sampling and analysis for a minimum of 30 years at the locations identified in the approved RD Work Plan. Samples shall be analyzed for the sampling parameters listed in the approved RD Work Plan, to ensure that performance standards continue to be attained. U.S. EPA may require an additional period of sampling and analysis beyond this 30 year period if warranted by site conditions.

If additional information indicates that the ground water monitoring program is inadequate, U.S. EPA may require installation of additional ground water monitoring wells, analysis for additional parameters, and more frequent sampling and analysis.

U.S. EPA reserves the right to specify the location of monitoring wells and require installation of additional wells to ensure that cleanup is achieved throughout the

contaminated plume.

If any ground water monitoring wells are destroyed, damaged or altered so that acceptable samples cannot be withdrawn from them, Respondents shall repair or replace the wells.

B. Air Monitoring Program

At all times during the performance of the Remedial Action, Respondents shall ensure that air emissions do not exceed a cumulative cancer risk of 1×10^{-6} at the nearest downwind residence, using risk calculation methods set forth in "Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part A", published in December 1989 by U.S. EPA's Office of Emergency and Remedial Response (Document Control Number 9285.7-01B) and in "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors", published in May 1991 by U.S. EPA's Office of Emergency and Remedial Response (Document Control Number 9285.6-03), or in any authorized superseded version of U.S. EPA risk assessment guidance. In addition, Respondents shall ensure that the air emissions do not exceed any ARARs. If air emissions exceed these levels, Respondents shall take corrective measures as developed in the Operation and Maintenance Plan or as required by U.S. EPA. Point(s) of compliance for air emissions shall be determined by the U.S. EPA, in consultation with the State, and shall be included in the RD Work Plan and the Operation and Maintenance Plan.

C. Ground Water Extraction/Treatment and ISVE Systems Monitoring Program

Respondents shall initiate a monitoring program for the ground water extraction/treatment and ISVE systems as approved in the Pre-Design Work Plan or as required by U.S. EPA. Respondents shall design the monitoring program to determine if the systems are properly functioning. Facility monitoring shall include collection and field/laboratory analysis of effluent samples to determine the effectiveness of the treatment system and the attainment of discharge standards. Sampling shall occur as defined in the U.S. EPA approved Draft Operations and Maintenance Plan. Respondents shall follow the sampling procedures and frequencies established for routine operations and monitoring as noted in the U.S. EPA approved Final Operation and Maintenance Plan.

5. <u>Ground Water Cleanup Standards</u>

The work required by the Order and this SOW shall be

designed, installed, operated and maintained to achieve the performance standards set forth in the Order, the ROD, and this SOW. No sooner than 60 days prior to the submission of the Final Remedial Action Report, Respondents shall sample the point of compliance wells to verify that ground water cleanup standards have been met.

III. SCOPE OF REMEDIAL DESIGN AND REMEDIAL ACTION

The Remedial Design/Remedial Action shall consist of five tasks:

Task 1: RD Work Plan

A. RD Work Plan
B. Pre-Design Work Plan/Borrow Source Work Plan

Task 2: Remedial Design Phases

A. Pre-design Activity Report
B. Preliminary Design
C. Intermediate Design
D. Prefinal Design/Final Design

Task 3: Remedial Action Work Plan

Task 4: Remedial Action/Construction

A. Preconstruction Meeting
B. Prefinal Inspection
C. Final Inspection
D. Reports

1. Final Construction Report
2. Completion of Remedial Action Report
3. Completion of Work Report

Task 5: Operation and Maintenance

Task 1: Remedial Design (RD) Work Plan

A. RD Work Plan

Settling Defendants shall submit a RD Work Plan which documents the overall management strategy for performing the design, construction, operation, maintenance and monitoring of Remedial Action (RA) for U.S. EPA review and approval. The plan shall document the responsibility and authority of all organizations and key personnel involved with the RA implementation and shall include a description of

qualifications of key personnel directing the Remedial Design, including contractor personnel. The Work Plan also shall contain a schedule of Remedial Design activities. The Settling Defendants shall submit a draft Remedial Design Work Plan according to the schedule identified in the Submission Schedule. The Settling Defendants shall submit a final Remedial Design Work Plan addressing U.S. EPA's comments on the draft RD Work Plan according to the schedule identified in the Submission Schedule.

B. Pre-Design Work Plan

This Remedial Design will require pre-design studies that will provide information necessary to fully implement the Remedial Design and Remedial Action. The Pre-Design Work Plan shall include, at a minimum, a pre-design QAPP, pre-design Health and Safety Plan, pre-design Field Sampling Plan and pre-design schedule to: (1) further delineate the extent of contamination in ground water, (2) conduct hydrological testing of aquifers to develop a ground water extraction system, (3) conduct pilot scale tests of the ISVE system and ground water extraction/treatment system to determine the most efficient design parameters for the full-scale implementation of these systems, and (4) a Material Borrow Source Work Plan will be prepared with the Pre-design Work Plan and a Material Borrow Source Report will be submitted with the Pre-design Activity Report.

Respondents shall implement the pre-design work so as to include the results of the pre-design studies with the 30% design. The pre-design work shall include:

1. Installation of additional monitoring wells east of well nest PZ-22 (east of Badfish Creek). Respondents shall submit proposed locations for these wells to U.S. EPA for review and approval.

2. Completion of hydrologic testing to develop quantitative information on hydrologic characteristics of the aquifer in the following locations: down gradient from landfill cell 12; the "ground water low" located northeast of the Site; and downgradient from landfill cell 6.

   This information is needed to determine the specific locations, construction and pumping rates for the design and installation of the ground water extraction/treatment system and for the ground water monitoring system.

3. Pilot-Scale Tests

In order to determine the most efficient design parameters for full-scale implementation of ISVE system, Respondents shall design and implement a pilot-scale test of the ISVE system in landfill cells 6 and 12. The pilot-scale testing shall be completed during the Pre-Design Activity. Respondents, pursuant to the submission schedule in this SOW, shall submit to U.S. EPA for approval, with a copy to the State, a Work Plan for conducting the pilot-scale test of the ISVE system. The Work Plan shall include, at a minimum: (1) the locations within the landfill cells where the pilot-scale test is to be conducted; (2) the operational parameters, (e.g., number of extraction wells, pumping rate) to be used during the pilot-scale test; (3) the treatment system to be used to treat off-gasses emitted from the test; and (4) the time necessary to conduct and complete the pilot-scale test. The Work Plan also shall include a sampling plan if physical properties of the waste and sub-soils at landfill cells 6 and 12 require characterization.

Respondents shall treat off-gas emitted from the ISVE pilot test to meet the requirements of the Chapter NR 440-499, WAC, ("Control of Hazardous Pollutants") and the federal Clean Air Act. Respondents shall submit to U.S. EPA for approval, with a copy to the State, an air emission monitoring program, specifying the frequency, duration, and compounds to be analyzed.

Respondents shall conduct the pilot-scale ISVE system test as approved by the U.S. EPA. At the conclusion of the pilot-scale test, Respondents shall submit the results to U.S. EPA and the State. Respondents also shall make the underlying data developed during the pilot-scale test available to U.S. EPA and the State. The pilot-scale test shall be used to determine the most efficient design parameters for full-scale implementation of the ISVE system in landfill cells 6 and 12. The design parameters shall include, at a minimum: the number of extraction and injection wells; spacing between wells; extraction pumping rate; depth of wells; and off-gas treatment requirements.

Pilot/treatability testing shall also include testing to develop site-specific parameters from ground water pumped during the hydrologic testing for the full-scale ground water treatment system. This information will identify any pre- and/or post-UV/oxidation treatment or a comparable technology consistent with the ROD, necessary to meet the effluent limits.

4. The Respondents shall prepare and submit to U.S. EPA

for approval a Potential Material Borrow Source Report which will identify potential soil material sources for cap construction. This report will identify any physical testing that has been performed on the soils as well as any potential problems associated with the use of the borrow sources.

Task 2: Remedial Design Phases

Respondents shall prepare construction plans and specifications to implement the Remedial Action at the Site as described in the ROD and this SOW. Plans and specifications shall be submitted in accordance with the schedule set forth in Section V below. Subject to approval by U.S. EPA, Respondents may submit more than one set of design submittals reflecting different components of the Remedial Action. Respondents shall develop all plans and specifications in accordance with U.S. EPA's "Superfund Remedial Design and Remedial Action Guidance" (OSWER Directive No. 9355.0-4A) and shall demonstrate that the Remedial Action will meet all objectives of the ROD, the Order, and this SOW, including all performance standards. Respondents shall meet regularly with U.S. EPA to discuss design issues.

A. Preliminary Design

Respondents shall submit the Preliminary Design when the design effort is approximately 30% complete. The Preliminary Design submittal shall include or discuss, at a minimum, the following:

- Preliminary plans, drawings, and sketches, including design calculations;
- Results of treatability studies and additional field sampling;
- Design assumptions and parameters, including design restrictions, process performance criteria, appropriate unit processes for the treatment system, and expected removal or treatment efficiencies;
- Proposed cleanup verification methods, including compliance with ARARs;
- Outline of required specifications;
- Proposed locations of construction, extraction, monitoring, pipeline conveyance, and treatment

operations;

- Expected long-term operation and maintenance requirements;

- Real estate, easement, and permit requirements; and

- Preliminary construction schedule, including contracting strategy.

B. Intermediate Design

Respondents shall submit the Intermediate Design when the design effort is approximately 60% complete. The Intermediate Design shall fully address all U.S. EPA comments made on the preceding design submittal. The Intermediate Design submittal shall include those elements listed above for the Preliminary Design and, in addition, the following:

- Draft Construction Quality Assurance Plan;

- Draft QAPP/Draft Health and Safety Plan/Draft Field Sampling Plan/Draft Contingency Plan; and

- Draft Contingency Plan

C. Prefinal and Final Designs

Respondents shall submit the Prefinal Design when the design effort is 95% complete and shall submit the Final Design when the design effort is 100% complete. The Prefinal Design shall fully address all comments made by U.S. EPA on the preceding design submittals. The Final Design shall fully address all U.S. EPA comments on the Prefinal Design and shall include reproducible drawings and specifications suitable for bid advertisement. The Prefinal Design shall serve as the Final Design if U.S. EPA has no further comments and issues the notice to proceed with remedial construction.

The Prefinal and Final Design submittals shall include those elements listed above for the Preliminary Design, as well as, the following:

- Final Contingency Plan;

- Final Construction Quality Assurance Plan;

- Final QAPP/Final Health & Safety Plan/Final Field Sampling Plan;

- Draft Operation and Maintenance Plan;

- Capital and operation and maintenance present-value cost estimate. This cost estimate shall refine the FS cost estimate to reflect the detail presented in the Final Design; and

- Final Project Schedule for the construction and implementation of the Remedial Action which identifies timing for initiation and completion of all critical path tasks. The final project schedule submitted as part of the Final Design shall include specific dates for completion of the project and major milestones.

Task 3: Remedial Action Work Plan

Respondents shall submit a Remedial Action Work Plan which includes a detailed description of the remediation and construction activities. The RA Work Plan shall include a project schedule for each major activity and submission of deliverables generated during the Remedial Action. Respondents shall submit a draft Remedial Action Work Plan according to the schedule identified in the Submission Schedule in this SOW. Respondents shall submit a final Remedial Action Work Plan in accordance with the Submission Schedule in this SOW.

Task 4: Remedial Action Construction

Respondents shall implement the Remedial Action as detailed in the Final Design. The following activities shall be completed in constructing the Remedial Action.

A. Preconstruction inspection and meeting:

Respondents shall participate with U.S. EPA and the State in a preconstruction inspection and meeting to:

a. Review methods for documenting and reporting inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. Conduct a site inspection to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes shall be transmitted to all parties.

B. Prefinal inspection

Upon preliminary project completion, Respondents shall notify U.S. EPA and the State for the purposes of conducting a prefinal inspection. The prefinal inspection shall consist of a walk-through inspection of the entire Site. The inspection is to determine whether the project is complete and consistent with the contract documents and the U.S. EPA-approved Remedial Action. Any outstanding construction items discovered during the inspection shall be identified and noted. Additionally, treatment equipment shall be operationally tested by Respondents. Respondents shall certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed. The prefinal inspection report shall outline the outstanding construction items, actions required to resolve items, completion date for these items, and a proposed date for final inspection.

C. Final inspection

Upon completion of any outstanding construction items, Respondents shall notify U.S. EPA and the State for the purposes of conducting a final inspection. The final inspection shall consist of a walk-through inspection of the Site by U.S. EPA, the State, and the Respondents. The prefinal inspection report shall be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Reports

1. Final Construction Report

This report shall be submitted by Respondents for those areas of the site at which the construction is complete, but performance standards have not yet been attained.

Respondents shall submit a Completion of Construction Report according to the schedule identified in the Submission Schedule in this SOW. In the report, a registered

professional engineer and the Respondents' Project Coordinator shall state that the Remedial Action has been constructed in accordance with the design and specifications. The written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Respondent or the Respondents' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. Completion of Remedial Action Report

Respondents shall submit a completion of Remedial Action Report pursuant to NR 516 and in accordance with the schedule identified in the Submission Schedule in this SOW. In the report, a registered professional engineer and the Respondents' Project Coordinator shall state the Remedial Action has been completed in full satisfaction of the requirements of the Order. The written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate official of a Respondent or the Respondents' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

3. Completion of Work Report

A Completion of Work Report shall be submitted by Respondents when they believe that the Work, as defined in the Order, has been performed.

Respondents shall submit a Completion of Work Report according to the schedule identified in the Submission Schedule in this SOW. In the report, a registered professional engineer and the Respondents' Project Coordinator shall state the Work has been completed in full satisfaction of the requirements of this Order. The written report shall include as-built drawings signed and stamped by a professional engineer. The report shall contain the following statement, signed by a responsible corporate

official of a Respondent or the Respondents' Project Coordinator:

"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Task 5: Operation and Maintenance

Respondents shall prepare an Operation and Maintenance (O&M) Plan to cover both implementation and long-term maintenance of the Remedial Action. An initial Draft O&M Plan shall be submitted with the final Design Document submission. Respondents shall submit the final O&M Plan according to the schedule identified in the SOW. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance:

    a. Description of tasks for operation;
    b. Description of tasks for maintenance;
    c. Description of prescribed treatment or operation conditions; and
    d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems:

    a. Description and analysis of potential operation problems;
    b. Sources of information regarding problems; and
    c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing:

    a. Description of monitoring tasks;
    b. Description of required data collection; laboratory tests and their interpretation;
    c. Required quality assurance, and quality control;
    d. Schedule of monitoring frequency and procedures for a petition to U.S. EPA to reduce the frequency of or discontinue monitoring; and
    e. Description of verification sampling procedures if Performance Standards are exceeded in routine monitoring.

4. Description of alternate O&M:

a. Should systems fail, alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and the environment or exceed cleanup or performance standards; and
b. Analysis of vulnerability and additional resource requirement should a failure occur.

5. Corrective Action:

a. Description of corrective action to be implemented in the event that Performance Standards are exceeded; and
b. Schedule for implementing these corrective actions.

6. Safety plan:

a. Description of safety precautions, and necessary equipment for site personnel; and
b. Safety tasks required in event of systems failure.

7. Description of equipment:

a. Equipment identification;
b. Installation of monitoring components;
c. Maintenance of site equipment; and
d. Replacement schedule for equipment and installed components.

8. Records and reporting mechanisms required:

a. Daily operating logs;
b. Laboratory records;
c. Records for operating costs;
d. Mechanism for reporting emergencies;
e. Personnel and maintenance records; and
f. Monthly/annual reports to State agencies.

IV. CONTENT OF SUPPORTING PLANS

The documents listed in this section -- the Quality Assurance Project Plan, the Field Sampling Plan, the Health and Safety Plan, the Contingency Plan and the Construction Quality Assurance Plan -- are documents which must be prepared and submitted as outlined in Section III of this SOW. The following section describes the required contents of each of these supporting plans.

A. Quality Assurance Project Plan

Respondents shall develop a site specific Quality Assurance Project Plan (QAPP) covering sample analysis and data handling for samples collected in all phases of future site work. The QAPP shall be drafted in accordance with the Consent Decree and guidance provided by U.S. EPA. The QAPP shall be consistent with the requirements of the EPA Contract Lab Program (CLP) for laboratories proposed outside the CLP. The QAPP, at a minimum, shall include:

1. Project Description:

   a. Facility Location History;
   b. Past Data Collection Activity;
   c. Project Scope;
   d. Sample Network Design;
   e. Parameters to be Tested and Frequency; and
   f. Project Schedule.

2. Project Organization and Responsibility

3. Quality Assurance Objective for Measurement Data:

   a. Level of Quality Control Effort;
   b. Accuracy, Precision and Sensitivity of Analysis; and
   c. Completeness, Representativeness and Comparability.

4. Sampling Procedures

5. Sample Custody:

   a. Field Specific Custody Procedures; and
   b. Laboratory Chain of Custody Procedures.

6. Calibration Procedures and Frequency:

   a. Field Instruments/Equipment; and
   b. Laboratory Instruments.

7. Analytical Procedures:

   a. Non-Contract Laboratory Program Analytical Methods;
   b. Field Screening and Analytical Protocol; and
   c. Laboratory Procedures.

8. Internal Quality Control Checks:

   a. Field Measurements; and

b. Laboratory Analysis.

9. Data Reduction, Validation, and Reporting:
   a. Data Reduction;
   b. Data Validation; and
   c. Data Reporting.

10. Performance and System Audits:

   a. Internal Audits of Field Activity;
   b. Internal Laboratory Audit;
   c. External Field Audit; and
   d. External Laboratory Audit.

11. Preventive Maintenance:

   a. Routine Preventative Maintenance Procedures and Schedules;
   b. Field Instruments/Equipment; and
   c. Laboratory Instruments.

12. Specific Routine Procedures to Assess Data Precision, Accuracy, and Completeness:

   a. Field Measurement Data; and
   b. Laboratory Data.

13. Corrective Action:

   a. Sample Collection/Field Measurement; and
   b. Laboratory Analysis.

14. Quality Assurance Reports to Management

Respondents shall attend a pre-QAPP meeting with U.S. EPA. Respondents shall submit a draft QAPP to U.S. EPA for review and approval.

B. Health and Safety Plan

Respondents shall develop a health and safety plan which is designed to protect on-site personnel and area residents from physical, chemical and all other hazards posed by this remedial action. The safety plan shall develop the performance levels and criteria necessary to address the following areas:

a. Facility Description;
b. Personnel;
c. Levels of protection;
d. Safe work practices and safe guards;

e. Medical surveillance;
f. Personal and environmental air monitoring;
g. Personal protective equipment;
h. Personal hygiene;
i. Decontamination - personal and equipment;
j. Site work zones;
k. Contaminant control;
l. Contingency and emergency planning; and
m. Logs, reports and record keeping.

The safety plan shall follow U.S. EPA guidance and all OSHA requirements as outlined in 29 C.F.R. Parts 1910 and 1926.

C. Contingency Plan

Respondents shall submit a Contingency Plan describing procedures to be used in the event of an accident or emergency at the Site. The draft Contingency Plan shall be submitted with the prefinal design and the final Contingency Plan shall be submitted with the final design. The Contingency Plan shall include, at a minimum, the following:

1. Name of the person or entity responsible for responding in the event of an emergency incident;

2. Plan and date(s) for meeting(s) with the local community, including local, State and Federal agencies involved in the cleanup, as well as local emergency squads and hospitals;

3. First aid medical information;

4. Air Monitoring Plan; and

5. Spill Prevention, Control, and Countermeasures (SPCC) Plan, as required in 40 C.F.R. Part 109, describing measures to prevent, and contingency plans for, potential spills and discharges from materials handling and transportation.

D. *Field Sampling Plan*

Respondents shall develop a Field Sampling Plan as described in "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," October 1988 by U.S. EPA's Office of Emergency and Remedial Response, Document Control Number 9355.3-01. The Field Sampling Plan should supplement the QAPP and address all sample collection activities.

E. Construction Quality Assurance Plan

Respondents shall submit a Construction Quality Assurance Plan (CQAP) which describes the Site-specific components of the quality assurance program which shall ensure that the completed project meets or exceeds all design criteria, plans, and specifications. The draft CQAP shall be submitted with the prefinal design and the final CQAP shall be submitted with the final design. The CQAP shall contain, at a minimum, the following elements:

1. Responsibilities and authorities of all organizations and key personnel involved in the design and construction of the Remedial Action;

2. Qualifications of the Quality Assurance Official which demonstrate he possesses the training and experience necessary to fulfill his identified responsibilities;

3. Protocols for sampling and testing used to monitor construction;

4. Identification of proposed quality assurance sampling activities including the sample size, locations, frequency of testing, acceptance and rejection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation. A description of the provisions for final storage of all records consistent with the requirements of the Order shall be included; and

5. Reporting requirements for CQA activities shall be described in detail in the CQA plan. This shall include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

V. SUBMISSION SCHEDULE FOR MAJOR DELIVERABLES

A summary of the reporting requirements contained in this SOW is presented below:

Submission	Due Date
1. Draft RD Work Plan	Sixty (60) days after effective date of the Order
2. Draft Pre-Design Work Plan	Sixty (60) days after effective date of the Order

3. Final RD Work Plan	Thirty (30) days after receipt of U.S. EPA comments on draft RD Work Plan.
4. Final Pre-Design Work Plan	Thirty (30) days after receipt of U.S. EPA comments on draft Pre-Design Work Plan
5. Pre-Design Activity Report	Thirty (30) days after completion of field activity
6. Preliminary Design (30%)	Sixty (60) days after receipt of U.S. EPA's approval of Pre-Design Activity Report
7. Intermediate Design (60%)	Forty Five (45) days after receipt of U.S. EPA's comments on the Preliminary Design
8. Prefinal Design (95%)	Sixty (60) days after receipt of U.S. EPA's comments on the Intermediate Design
9. Final Design (100%)	Thirty (30) days after receipt of U.S. EPA's comments on the Prefinal Design
10. Draft RA Work Plan	Thirty (30) days after U.S. EPA approval of 100% Design
11. Final RA Work Plan	Thirty (30) days after receipt of U.S. EPA comments on draft RA Work Plan
12. Pre-Construction Inspection and Meeting	Fifteen (15) days after Award of RA Contract(s)
13. Initiate Construction of RA	Fifteen (15) days after Pre-Construction Inspection and meeting
14. Completion of Construction	As provided in approved Final RA Work Plan
15. Prefinal Inspection	No later than fifteen (15) days after completion of

		construction
16.	Prefinal Inspection Report	Fifteen (15) days after completion of prefinal inspection
17.	Final Inspection	Fifteen (15) days after completion of work identified in prefinal inspection report
18.	Final O&M Plan	No later than the date of the prefinal inspection
19.	Completion of Construction Report	Thirty (30) days after final inspection
20.	Completion of Remedial Action Report	Within ninety (90) days after Respondents conclude Remedial Action has been fully performed
21.	Completion of Work Report	Within ninety (90) days after Respondents conclude all phases of Work have been fully performed

TABLE A
GROUND WATER CLEANUP STANDARDS

Ground water cleanup standards are included in the ROD. The cleanup standards will be Wisconsin Preventative Action Limits (PAL) except in those instances where a PAL is not established. In such cases, the cleanup standard will be the Maximum Contaminant Levels (MCL) as established under the Federal Safe Drinking Water Act. A (-) entry indicates that no PAL or MCL has been established.

CONTAMINANT	CLEANUP STANDARD (in parts per billion)
Organic Compounds	
Acetone	-
Benzene	0.067
Benzoic Acid	-
2-Butanone	-
Carbon Tetrachloride	0.5
Chloroethane	-
1,1-Dichloroethane	85
1,2-Dichloroethane	0.05
trans-1,2-Dichloroethene	20
1,2-Dichloropropane	5 [redacted] (MCL)
Diethylphthalate	-
Ethylbenzene	272
2-Hexanone	-
Isophorone	-
4-Methyl-2-pentanone	-
Methylene Chloride	15
2-Methylphenol	-

CONTAMINANT	CLEANUP STANDARD (in parts per billion)
Organic Compounds	
4-Methylphenol	-
Naphthalene	-
Phenol	-
1,1,2,2-Tetrachloroethane	-
Tetrachloroethene	0.1
Tetrahydrofuran	10
Toluene	68.6
1,1,1-Trichloroethane	40
Trichloroethene	0.18
Vinyl Acetate	-
Vinyl Chloride	0.0015
m-Xylene	124
o & p-Xylene(s)	124

CONTAMINANT	CLEANUP STANDARD (in parts per billion)
Inorganic Substances	
Aluminum	200
Arsenic	5
Barium	200
Beryllium	1 (MCL)
Boron	-
Cadmium	1
Calcium	-
Chloride	125000
Chromium	5
Cobalt	-
Copper	500
Cyanide	40
Fluoride	44
Iron	150
Lead	5
Magnesium	-
Manganese	25
Nickel	100 (MCL)
Nitrate	2000
Potassium	-
Selenium	1
Silver	10
Sodium	-

CONTAMINANT	CLEANUP STANDARD (in parts per billion)
Inorganic Substances	
Sulfate	125000
Vanadium	-
Zinc	2500

TABLE B
EFFLUENT DISCHARGE CLEANUP STANDARDS

The State of Wisconsin has promulgated Wisconsin Water Quality Standards and Criteria (WWQC) under Chapters NR 102, NR 103, and NR 105, WAC, and the procedures for calculating the toxic effluent limits under Chapter NR 106, WAC. Chapters NR 104, NR 108, and NR 207, WAC, also apply in determining water quality based limits.

The State is authorized to implement the National Pollutant Discharge Elimination System (NPDES) program. Requirements for discharge of treated water are dependent on the point of discharge. Procedural requirements of this permit system, administered under Chapter NR 220, WAC, do not apply to a discharge of water into a surface water body at the Site, since discharge into Badfish Creek is considered "on-site". Subject to approval of U.S. EPA, effluent limits for surface water discharge will be established by the State when the volume of water to be discharged is more fully defined at the time of submittal of the Preliminary Design. Chapter NR 220, WAC, requires that the effluent limits be based on the application of best available technology (BAT) prior to discharge.