

ARCS V

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Remedial Activities at Uncontrolled Hazardous Waste Sites in Region V



WORK PLAN FOR REMEDIAL DESIGN

ONALASKA MUNICIPAL LANDFILL
Onalaska, Wisconsin

WA 38-5NL5
Contract No. 68-W8-0040



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**BUREAU OF SOLID -
HAZARDOUS WASTE MANAGEMENT**

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INTRODUCTION

GENERAL

This work plan defines the scope of activities, schedule, and budget for accomplishing the remedial design for the Onalaska Municipal Landfill Site in accordance with the Work Assignment No. 38-5NL5. The activities identified in the work assignment are:

- Prepare contract documents for the bidding and construction of a groundwater extraction and treatment system
- Prepare a draft O&M plan for the designed facility
- Assist the U.S. EPA in its review of the landfill cap design to be prepared by the State
- Prepare contract documents for the bidding and construction of an in situ bioremediation system to treat nonaqueous phase liquids (predominantly naphtha) in the vadose zone downgradient from the landfill
- Prepare a long-term groundwater monitoring plan
- Conduct treatability testing to assist the design of the groundwater treatment and in situ bioremediation systems

PROJECT BACKGROUND

The Onalaska Municipal Landfill site is located in the township of Onalaska, LaCrosse County, Wisconsin. The site consists of Onalaska's former municipal landfill, which is approximately 8 acres and up to 15 feet deep, and adjacent property where the groundwater contaminant plume or naphtha contaminants have migrated. The site is bordered by the Black River to the north and west, and Sportsman Club Road to the south and east (Figure 1).

Onalaska has erected a steel-sided storage shed on the property just off the landfill to the southwest, otherwise the property is devoid of structures or impoundments. Topographical relief within the landfill area is minimal, but in the southern portion of the site, just beyond the landfill area, the ground surface dips southwesterly 10 to 20 feet.

The site was a sand and gravel quarry before it was used as a municipal landfill from the 1960s to the mid-1970s. Industrial wastes, including the naphtha-based solvents, were also disposed of at the site. The solvents were usually hauled to the site in 55-gallon drums, the contents of which were dumped into the landfill and then covered with dirt. Fifty-five-gallon drums of waste solvents may also have been disposed of at the site. For a short time, the solvent wastes were burned along with the municipal trash.

The U.S. EPA conducted a remedial investigation and feasibility study (RI/FS) at the site from April 1988 to December 1989. The RI determined that, as a result of waste disposal at the landfill, various chemical contaminants have been leaching into the groundwater and flowing towards the Black River. The Record of Decision (ROD), signed in August of 1990, calls for the following remedial action to protect human health and the environment:

- Design, construction, and operation and maintenance of a groundwater extraction, treatment, and discharge system to meet designated cleanup standards and discharge requirements to be determined
- In situ bioremediation of the naphtha-contaminated soil, which resulted from naphtha floating on the groundwater table and emanating from the landfill
- The design, construction, and maintenance of a landfill cap meeting State requirements under applicable or relevant and appropriate law
- Periodic monitoring of groundwater, surface water, and sediments to ensure protection of human health and the environment

Since the site is municipally-owned and no potentially responsible parties have been ordered to perform the above work, the State of Wisconsin will provide 50 percent of the funding of the remedial action. The Wisconsin Department of Natural Resources (WDNR) has indicated that it will be responsible for the design and implementation of the landfill cap.

GOALS OF THE REMEDIAL DESIGN

The goals of the remedial design will be to:

- Prepare design drawings and specifications (contract documents) for a groundwater extraction/treatment system and an in situ biotreatment system, suitable for public bidding
- Prepare a definitive level construction cost estimate, and operation and maintenance cost estimate
- Prepare a draft operations and maintenance plan that will be modified by others once the groundwater remediation system has been initially operated
- Perform other tasks as necessary (e.g., prepare health and safety plan and conduct treatability testing) to design the groundwater and soil remediation systems

The groundwater extraction system should be capable of capturing contaminated groundwater emanating from the landfill. The groundwater treatment system should achieve the goals of BAT for removal of VOCs and iron from the extracted groundwater. Because discharge from the treatment system is considered by U.S. EPA and WDNR to be onsite, it will not be required to obtain a WPDES

permit. The discharge must meet the substantive requirements of a permitted outfall, however.

The in situ biological treatment system should promote the degradation of organic compounds in the zone of groundwater fluctuation. The system should be designed to enhance the ability of microbes already present in the soil to degrade organic compounds of concern in the zone of groundwater fluctuation. The estimated target cleanup goal, as specified in the Record of Decision (ROD), is 80 to 95 percent reduction in the mass of organic contaminants in the contaminated soil.

SCOPE OF WORK AND TASK DESCRIPTIONS

The remedial design scope of work will be implemented through the following tasks:

- Project Planning (PP)
- Preliminary Design (PD)
- Prefinal/Final Design (FD)
- Design Support (DS)
- Project Closeout (PC)

TASK PP—PROJECT PLANNING

The project planning task includes activities related to the planning and management of the overall project. Effort for work planning, management, and QC subtasks have been ongoing under the interim authorization.

Subtask PP.PP—Project Planning

This subtask includes labor hours for the initial kickoff meeting between CH2M HILL and U.S. EPA, and labor for a site visit by the project manager to the Onalaska Municipal Landfill site. This subtask also includes labor for assembling the information necessary to commence preparation of the work plan.

The estimated level-of-effort (LOE) for this subtask is 40 hours.

Subtask PP.PM—Project Management

Activities performed under Subtask PP.PM include project management activities related to the preparation of the work plan, and activities related to the ongoing management of the overall project. These activities include:

- Management of work planning activities
- Preparation of monthly technical status reports
- Preparation of monthly budgets and schedules (forecasting)
- Filing and document control

- Regular coordination discussions with the WAM on issues otherwise not related to project management of specific project tasks

Project management and administration costs are estimated on the basis of project duration. For this remedial design work assignment, the project management LOE estimates assume a project duration of 12 months (March 1991 to March 1992).

This task also includes 16 LOE hours for the RD project manager and the RI/FS project manager to attend one meeting in Madison to discuss the effluent limits for the treatment system discharge with the WDNR.

The estimated LOE for this project is 160 hours.

Subtask PP.WP—Prepare EPA Work Plan

This work plan was prepared under Subtask PP.WP using interim authorization funding. The purpose of the work plan is to define and describe the tasks necessary to accomplish the basic scope outlined in the Work Assignment, and to present the budget and schedule associated with the RD tasks. This subtask assumes that the initial work plan will be submitted in final form, and that only minor modifications will be required following review. Agency review comments will be incorporated and revised pages of the initial submittal will be submitted for final approval.

Activities involved in work plan development include:

- Development of scope of work and associated budget
- Developing a schedule for the remedial design
- Identifying lead engineers and scientists for the project teams
- Establishing lines of responsibility of organizations and personnel involved
- Preparation and submitting two deliverables (a work plan and one set of revised pages for substitution for the corrected pages)

The estimated LOE for this subtask is 142 hours.

Subtask PP.ED—Existing Data Review

The project members will conduct an initial review of available documents to prepare the work plan and execute the design.

The estimated LOE for this subtask is 40 hours.

Subtask PP.QC—Quality Control

Subtask PP.QC will provide for internal quality control review of the work plan. This subtask also includes preliminary senior review to provide guidance on deliverable

preparation. The subtask budget assumes the following will be performed under this subtask:

- Discussions with review team members to conceptualize the work plan approach and address critical issues pertinent to work plan preparation
- Discuss comments on the internal review draft work plan

The estimated LOE for this subtask is 24 hours.

TASK PD—PRELIMINARY DESIGN

Task PD includes the design activities required to define the basic components and design criteria for the groundwater extraction and treatment system, and the in situ biotreatment system. The culmination of this task will be a preliminary design report, which will be submitted to the U.S. EPA and WDNR to gain their concurrence on the proposed treatment processes before initiating the final design.

Subtask PD.PM—Project Management

Under this subtask, the project manager will conduct day-to-day management of the preliminary design subtasks, including:

- Providing guidance to team members on project and subtask objectives
- Routine monitoring of the progress of active tasks
- Staffing subtasks
- Coordination with the U.S. EPA (aspects specific to these subtasks)
- Routine quality control
- Resolution of internal and external review comments

This subtask also includes 16 LOE hours for the preparation of project instruction for the design team, 16 LOE hours for a predesign project team meeting, and 60 LOE hours for weekly design status meetings between the project manager and the lead design engineers.

The estimated LOE for this subtask is 148 hours.

Subtask PD.MG—Meetings

This subtask budgets for three meetings: one with the U.S. EPA to discuss progress of the predesign, one to present or discuss the predesign report to the U.S. EPA and the WDNR, and one with representatives of the party that will be responsible for the operation of the treatment systems. This subtask assumes one meeting will be held in Chicago, one in Madison, and one in LaCrosse.

The estimated LOE for this subtask is 80 hours.

Subtask PD.HS—Health and Safety Plan

Under this subtask, a health and safety plan will be prepared for the collection of samples for bench-scale groundwater treatability testing and bench-scale

biotreatability testing. The budget for this subtask assumes the existing Health and Safety Plan could be revised for this purpose. The estimated LOE for this subtask is 48 hours.

Subtask PD.QS—Quality Assurance Project Plan

Under this subtask, CH2M HILL will prepare a QAPP for bench-scale treatability testing of the in situ biotreatment method. This work plan assumes the treatability testing will be shake flask type tests. The LOE budgeted for this subtask assumes the QAPP will be submitted for review and approval by the U.S. EPA's Waste Management Division, and that only 24 LOE hours will be required to address minor revisions.

This work plan assumes that a QAPP for the bench-scale groundwater treatability testing performed under Subtask H1 (including treatability testing and bioassay testing) will not be required. Testing protocol, objectives, and methods for the testing will be developed under Subtask PD.H1 before testing, but will not be submitted formally as a QAPP.

The estimated LOE for this subtask is 240 hours.

Subtask PD.H1—Groundwater Extraction/Treatment Process Predesign

Under this subtask, the basis for the final design of the groundwater extraction and treatment processes will be prepared. The predesign will determine the basic components and capacities of the major equipment that will make up the final design. The subtask includes bench-scale testing to better determine the effectiveness of proposed treatment processes.

Bench-scale testing will include bioassay testing and groundwater treatability testing. Bioassay testing conducted during the RI/FS indicated the presence of compounds toxic to test organisms. The proposed bioassay testing will be conducted to determine if the toxic compounds can be removed through air stripping, metals complexation/precipitation, or activated carbon. The results of the testing will help determine if the proposed treatment system will remove the compounds contributing to aquatic toxicity. The estimated LOE and expenses for this portion of the subtask are 40 hours and \$9,000, including sample collection and laboratory testing. This work would be performed at CH2M HILL's bioassay laboratory in Milwaukee, Wisconsin.

The treatability testing would include bench-scale evaluation of the effectiveness of aeration and chemical addition on producing an iron precipitate, and the settleability and filterability of the precipitant. The principal focus of the treatability testing will be to determine the most practical approach to iron removal. Should results of the bioassay testing indicate the need for treatment processes other than iron removal and volatiles stripping, then these processes would also be tested on a bench scale if the existing budget allows. The bench-scale testing will be conducted by CH2M HILL project team members at the CH2M HILL laboratory in Milwaukee. This subtask includes expenses for laboratory analysis of the untreated and treated water for iron and other conventional parameters at CH2M HILL's Corvallis laboratory. Results of the treatability tests will be used to conduct other preliminary design functions. This subtask includes time for preparing:

- Preliminary process and instrumentation diagrams
- Design criteria
- Unit process flow sheets and preliminary mass balances
- General arrangement drawings
- A preliminary construction schedule

It also includes time for identification of:

- Major equipment items
- Long-lead procurement items
- Relevant construction codes
- Source of electricity
- The qualifications of persons responsible for operation and maintenance of the treatment system

The subtask includes evaluation of pump test results to select the number and location of extraction wells, and developing predictions of groundwater characteristics from pump test data and monitoring well data. These products will be assembled into a predesign report under Subtask R7.

The estimated LOE for this subtask (H1) is 638 hours. This estimate assumes the groundwater treatment system will consist of air stripping to remove VOCs and clarification and filtration to remove iron and TSS.

Subtask PD.H6—In Situ Biotreatment System Predesign

Under this subtask, the basis for the final design of the in situ biotreatment system will be prepared. The predesign will determine the basic components and capacities of the major equipment that will make up the final design.

This subtask includes bench-scale testing to assess the ability of indigenous microorganisms to degrade volatile and semivolatile contaminants found in the contaminated soil through stimulation by addition of air or nutrients. The testing will also assess the extent to which the contaminants will be volatilized instead of degraded by aerating the soil. The potential need to add microorganisms will be evaluated during the treatability testing. The treatability testing would not be designed to determine the soil cleanup standard. The data would be used, however, to estimate the maximum percent removal.

Samples of contaminated soil will be collected under this task for use in the treatability testing. Treatability testing will be performed by CH2M HILL at its Corvallis, Oregon, laboratory. This work plan assumes that the treatability testing will be shake flask type tests, and would be conducted over a period of 3 to 4 weeks. The subtask includes laboratory analyses and data validation. Results of the testing will be documented in the predesign report prepared under Subtask R7.

This subtask presumes that additional bench-scale or pilot-scale testing will not be required to design the process, and it has not been budgeted into this work plan.

Results of the treatability tests will be used to conduct other preliminary design functions. The subtask includes time for preparing:

- Preliminary process and instrumentation diagrams
- Design criteria
- General arrangement drawings
- A preliminary construction schedule

It also includes time for identification of:

- Major equipment items
- Long-lead procurement items
- Relevant construction codes
- The qualifications of persons responsible for operation and maintenance of the treatment system

The estimated LOE for this subtask is 544 hours.

Subtask PD.C1—Geotechnical Investigation

This subtask includes labor, expenses, and drilling subcontract costs to perform a geotechnical investigation for the design of foundations for the groundwater treatment system. The scope of work for this subtask assumes the area geology and groundwater levels are well-defined based on boring logs produced during the remedial investigation, and that proposed structures are expected to be placed at the existing grade. No geotechnical testing is proposed under this subtask based on the relatively uniform conditions expected at the site. If subsurface conditions are found to vary from those expected or if assumed structures change requiring cuts and fills, then grain size analysis, plasticity index, and soil compaction testing may be required.

The subtask includes developing subcontract documents, coordinating work with the drilling subcontractor, evaluating soil and foundation conditions, and writing a geotechnical report. A small procurement subcontract for drilling services is assumed to be required. The subtask includes LOE for coordinating work with structural and civil designers, assuming all structures are placed on existing grade.

The estimated LOE for this subtask is 60 hours.

Subtask PD.EC—Cost Estimate

Under this subtask, a preliminary design level cost estimate (+30/-15 percent) will be prepared for inclusion in the predesign report.

The estimated LOE for this subtask is 120 hours.

Subtask PD.R7—Predesign Reports

Under this subtask, two preliminary design reports will be prepared for submittal to the U.S. EPA and WDNR, one for groundwater extraction and treatment and another for in situ biotreatment. This subtask includes LOE for preparation of the deliverables from data generated under Subtasks H1 and H6.

The groundwater treatment preliminary design report will:

- Summarize results and conclusions from treatability testing
- Provide an appendix detailing treatability methods and data
- Present a proposed groundwater extraction and treatment process, including process flow diagram, number and quantity and capacity of major equipment, preliminary process and instrumentation diagrams, and preliminary equipment layout
- Present design criteria used to size process components
- Describe anticipated performance of the system
- Address how the proposed process will meet the WDNR's water quality-based effluent discharge limits, BAT, and toxicity requirements

The in situ biotreatment preliminary design report will:

- Summarize results and conclusions from treatability testing
- Provide an appendix detailing treatability methods and data
- Present a proposed treatment process, including preliminary layout, number and quantity and capacity of major equipment, preliminary process and instrumentation diagram, and preliminary equipment layout
- Describe the anticipated performance of the system
- Present design criteria used to size process components

The estimated LOE for this subtask is 264 hours.

Subtask PD.QC—Quality Control

Subtask PD.QC will provide for quality control review of deliverables before they are submitted for agency review. It will include:

- Review of preliminary design reports (for both the groundwater collection/treatment design and the in situ biotreatment design)
- Review of cost estimate and construction schedule
- Review of a groundwater bench testing protocol and a QAPP for bench-scale biotreatment testing
- Continued, regular involvement of the review team leader (RTL)

The estimated LOE for this subtask is 84 hours.

TASK FD—PREFINAL / FINAL DESIGN TASKS

Task FD includes the design activities required to produce plans and specifications for the bidding and construction of groundwater extraction, groundwater treatment, and in situ biological treatment systems. Related activities include preparation of drawings and technical specifications, bid documents, cost estimates and construction schedule, and a draft O&M manual.

Subtask FD.PM—Project Management

Under this subtask, the project manager will conduct day-to-day management of the prefinal and final design subtasks, including:

- Providing guidance to team members on project and subtask objectives
- Routine monitoring of the progress of active tasks
- Staffing subtasks
- Coordination with the U.S. EPA (aspects specific to these subtasks)
- Routine quality control
- Resolution of internal and external review comments

This subtask also includes 16 LOE hours for the preparation of project instructions for the design team, 24 LOE hours for a design team kickoff meeting, and 64 LOE hours for weekly design status meetings with the project manager and the lead design engineers.

The estimated LOE for this subtask is 196 hours.

Subtask FD.GX—Groundwater Extraction Design

This subtask includes the preparation of drawings and technical specifications necessary to construct a groundwater extraction system. The zone of influence of the extraction system will extend approximately 1,000 feet across the southwestern portion of the site. The budget for this subtask assumes that the design will consist of four wells with a sum total extraction capacity of 400 gpm.

At the 95 percent complete stage (prefinal design), the following will be provided to U.S. EPA and WDNR for review:

- Plans and technical specifications, including a list of key submittals by the contractor
- Construction schedule
- A definitive construction cost estimate, with probable range of +15 percent to -10 percent for each work item and unit price (work to be performed under Subtask EC)

The final design submittal will incorporate comments from the review of the 95 percent submittal. The final design drawings will also be stamped by a P.E. and may be reduced for binding into the bidding documents. Reproduction of the design documents will be performed under Subtask FD.DS.

The estimated LOE for this subtask is 328 hours.

Subtask FD.GT—Groundwater Treatment Design

Drawings and technical specifications will be prepared for a groundwater treatment system under this subtask. The level of effort is based on the assumption that the groundwater treatment system will consist of air stripping to remove VOCs and clarification and filtration to remove iron and TSS. The subtask assumes the design will be predominately of the definitive-type (as opposed to performance-based) where the design will specify equipment sizes, capacity, materials of construction, and instrumentation and control requirements.

Included in this subtask is the design of a structure to house sludge dewatering equipment and a motor control center. The subtask also includes design of an outfall, which is assumed to be a submerged diffuser located in the Black River. It is also assumed that permitting for construction in wetlands would not be required. The use of a cascade type outfall will be investigated, but the budget estimate for this task provides for a cursory evaluation. Should the cascade type outfall be preferred by the WDNR, the adequacy of the budget to design this component will be reevaluated.

At the 95 percent complete stage (prefinal design), the following will be provided to the U.S. EPA and WDNR for review:

- Plans and technical specifications, including a list of key submittals by the contractor
- Construction schedule
- A definitive construction cost estimate, with a probable range of +15 percent to -10 percent for each work item and unit price (work to performed under Subtask EC)

The final design submittal will incorporate comments from the review of the 95 percent submittal. The final design drawings will also be stamped by a P.E. and will be reduced for binding into the bidding documents.

The estimated LOE for this subtask is 1,160 hours.

Subtask FD.DS—Prepare Bidding Documents

This subtask includes LOE and expenses for preparation of bid documents and reproduction of four sets of design documents, i.e., a 95 percent and 100 percent submittals for both the groundwater extraction/treatment and in situ biotreatment systems (i.e., two independent subcontracts). The final design submittals will include two sets of drawings and specifications and one set of reproducible drawings and specifications. This subtask assumes that CH2M HILL's standard invitation to bid, instruction to bidders, bidding forms, general conditions and supplementary conditions, will be used in the final design submittal. The subtask includes development of contract documents. Bid documents will be prepared assuming the Remedial Action work assignment will be executed by CH2M HILL. This work plan does not include budget for the advertisement for bids, or reproduction of bidding

documents for distribution to bidders. Any changes to CH2M HILL's standard documents requested by U.S. EPA are not included in this budget.

The estimated LOE for this subtask is 300 hours.

Subtask FD.SL—Construction Schedule

Under this task, CH2M HILL will prepare a design construction project schedule and a construction quality assurance plan. It is assumed that the construction quality assurance plan could be used for both construction subcontracts.

The estimated LOE for this subtask is 382 hours.

Subtask FD.EC—Cost Estimating

This subtask will be used during the design to develop the definitive cost estimate for constructing the remedial action. Capital cost estimates will be prepared at the 95 percent and 100 percent stages. A breakdown and report of capital and operating and maintenance costs will be prepared as well for the 95 percent and 100 percent submittals.

The estimated LOE for this subtask is 224 hours.

Subtask FD.MG—Meetings (External)

Meetings held between CH2M HILL and regulatory agencies will be budgeted under this subtask. The budget for the subtask assumes two meetings will be held with the U.S. EPA and WDNR to discuss the status of the groundwater extraction/treatment and in situ biotreatment designs before submittal of the prefinal designs, and two meetings will be held to discuss the comments on the prefinal design submittals. The subtask budget assumes the meetings will be held in Chicago or in Madison. This subtask includes preparation of meeting agendas and visual aids.

*4 meetings
HAD 1 @ Mill
HAD 1 @ WDFW
HAD 1 @ BIO
HAD 1 @ site
HAD 1 @ Madison
(AT LAX)*

The estimated LOE for this subtask is 100 hours.

Subtask FD.ML—Draft Operation and Maintenance Manual

CH2M HILL will prepare a draft Operation and Maintenance Manual that will address the implementation and long-term maintenance of the Groundwater remedial action. The plan will include a site description, a system overview, the scope and organization of the manual, a description of the various equipment on site, their integration and purpose, descriptions of startup and shutdown procedures, normal operation and maintenance, potential operating problems and troubleshooting responses, recordkeeping of routine maintenance and repair, potential safety hazards, parts inventory, and maintenance checklists.

The O&M manual will be submitted in draft form. It is anticipated that revisions to the draft will be made during the RA phase by others. This subtask assumes that five copies of the draft report will be submitted to U.S. EPA as the deliverable.

The O&M manual will not address the maintenance of the cap or the biotreatment system. The O&M manual will include procedures for sampling influent and effluent from the groundwater treatment system, but it does not address sampling of groundwater monitoring wells.

The estimated LOE for this subtask is 272 hours.

Subtask FD.IT—In Situ Treatment Design

Under this task, CH2M HILL will prepare drawings and specifications for an in situ bioremediation treatment system. The design will be based upon results of task PD.H6 and from relevant experience of the project team. The LOE budgeted for this task assumes the system will consist of air injection and air extraction in the 4-foot groundwater fluctuation zone, and also includes design of a system to introduce moisture and nutrients to the area of soil undergoing treatment, similar to the system described in the Feasibility Study. The system design could be revised under subtasks PD.H6 and PD.R7. The subtask assumes that the predesign and final design for the in situ treatment system will be prepared independently from the groundwater treatment system. Under this subtask, possible methods for determining the performance of the biotreatment system during its operation will be evaluated.

The estimated LOE for this subtask is 584 hours.

Subtask FD.QC—Quality Control

Subtask FD.QC will provide for quality control review of deliverables before they are submitted for agency review. It will include:

- Review of plans and specifications (95 percent and 100 percent submittals) for both the groundwater collection/treatment design and the in situ biotreatment design
- Review of the O&M manual
- Review of cost estimate and construction schedule
- Continued, regular involvement of the senior reviewers on a consulting basis to the project team

The estimated LOE for this subtask is 160 hours.

TASK DS—DESIGN SUPPORT TASKS

Subtask DS.PM—Project Management

Under this subtask, the project manager will conduct day-to-day management of the prefinal and final design subtasks, including:

- Tracking schedule and budget
- Directing team members
- Staffing subtasks
- Coordination with the U.S. EPA (aspects specific to these subtasks).

This subtask also includes the preparation of project instruction for the design team, and weekly design status meetings with the project manager and the lead design engineers.

The estimated LOE for this subtask is 64 hours.

Subtask DS.GM—Groundwater Monitoring Plan

CH2M HILL will prepare and submit to the U.S. EPA for review and approval, in consultation with the WDNR, a groundwater, surface water, and sediment monitoring program. The monitoring program will be designed to monitor the effectiveness of the groundwater collection system in meeting the requirements of the ROD as well as conditions and the environment at the site.

The purpose of the system will be to detect migration of contaminants at the site boundary and movement and concentrations of the contaminant plume. Results of the monitoring will be used to evaluate the effectiveness of the system to capture and contain the groundwater plume. Existing monitoring wells will be used to the maximum extent practicable. The locations and depths of new monitoring wells or piezometers will be determined as shown on a plan, which will consist of one site drawing and will be incorporated into the design drawings and the operation and maintenance manual.

The plan will address:

- Sampling protocols and methodologies
- Sampling schedules and frequencies
- Analytical procedures and methods
- Procedures for data analysis, evaluation, and management
- Reporting requirements

The plan may also address

- Quality assurance and quality control procedures
- Data validation criteria
- Methods for calculation of background concentrations
- Actions to be considered if migration of contamination is not being prevented by the groundwater collection system

The above possibilities depend on the outcome of meetings held with the WDNR, but the budget for this subtask does not include LOE for incorporating them into the monitoring plan.

The estimated LOE for this subtask is 416 hours.

Subtask DS.MG—Meetings (External)

Meetings held with the U.S. EPA or WDNR to discuss issues related to work performed under the DS subtasks will be performed under this subtask. The subtask assumes four 1-day meetings with the U.S. EPA and the WDNR will be held in Chicago, Madison, or La Crosse; four meetings (attended by three members of CH2M HILL's staff) to discuss the groundwater monitoring plan, and one meeting (attended by two members of CH2M HILL's staff) to discuss comments on the landfill cap design.

The estimated LOE for this subtask is 140 hours.

Subtask DS.MS—Miscellaneous Support

Review of miscellaneous deliverables from the state or other sources that have otherwise not been identified or are not addressed under another task will be performed under this subtask. The WAM will issue a work assignment technical direction memorandum along with the document to be reviewed. CH2M HILL will not proceed with review of the deliverables or documents until so authorized by the work assignment form (WAF).

This work plan includes 80 hours for the review of the miscellaneous deliverables.

Subtask DS.QC—Quality Control

Subtask DS.QC will provide for quality control review of deliverables before they are submitted for agency review. It will include:

- Review of groundwater monitoring plan
- Review of comments on miscellaneous deliverables
- Review of comments on the landfill cap

The estimated LOE for this subtask is 64 hours.

Subtask DS.LS—Landfill Cap Support

Under this subtask, CH2M HILL will review landfill cap design to be produced by the WDNR, and prepare written comments for the U.S. EPA. The review will assess the design's compliance with the requirements of NR 504.07. The LOE for this subtask assumes the design will be prepared by a consulting engineer and that three reviews (conceptual, preliminary, and prefinal design submittals) will be performed by CH2M HILL.

The estimated LOE for this subtask is 84 hours.

TASK PC—PROJECT CLOSEOUT

Subtask PC.PC—Project Closeout Procedures

All project files will be consolidated and indexed according to U.S. EPA guidance for storage and microfilming.

Time and expenses required to close out the project after the work assignment has been completed will be managed under this subtask. These activities will involve collecting and organizing the project files in preparation for final archiving and shipment to a central repository for final processing and storage. A work assignment closeout request will also be prepared under this subtask and submitted to the agency.

The estimated LOE for this subtask is 100 hours.

STAFF ORGANIZATION

The staff members and their responsibilities on this work assignment are presented in Figure 2.

Steve Keith will be the site manager for this work assignment. He has over 9 years' experience as an environmental engineer, and has been assistant SM for two RI/FSs and the SM for an RD oversight. As SM, Mr. Keith will be the principal contact for CH2M HILL. He is a licensed PE in the State of Wisconsin.

The lead process engineer on this project will be Paul Boersma, who has been an engineer on more than a dozen projects related to groundwater remediation. Mr. Boersma, was the lead engineer on the Onalaska FS, helps to maintain continuity between the projects. His responsibilities will include providing project management assistance, process design for the groundwater treatment system, and process design for the in situ treatment system.

The lead hydrogeologist for this project will be Jeff Lamont, who has over 10 years' experience as a hydrogeologist. Mr. Lamont served as lead hydrogeologist for the RI/FS and therefore helps to maintain continuity throughout the projects. He will serve as lead designer for the groundwater extraction system.

The review team will be composed of Phil Smith, Bill Stickney, Tony Myers, and Mike Jury. Phil Smith served as the SM for the RI/FS and maintains continuity for the project management. Bill Stickney is currently the assistant ARCS 5 PM for Design and Construction and brings to the project more than 20 years' experience in design and construction management. Tony Myers has 6 years' experience in designing water treatment systems, including air stripping systems. Mike Jury has been project manager and review team leader for numerous remedial investigations and remedial designs, and has extensive experience in the design of industrial wastewater treatment systems.

The core project team members will be assisted by specialists from other disciplines as needed.

SCHEDULE

The schedule for completing this work assignment is presented in Figure 3.

BUDGET

The estimated cost of completing the work assignment is \$595,852, at an estimated expenditure of 7,286 LOE hours. A detailed cost estimate is attached.

GLT175/015.51

Client Proj No.: 88-6NLS
 Master Project: 6560200

Micro Workplan
 Project Summary (Includes Fee)
 Onalaska Municipal Landfill, WI
 KEITH S M

Report PRJ200
 Page 1
 Run Date: 04/17/91
 Run Time: 14:37:44
 As Of: 03/91

T A S K			-Project To Date-		-Est To Complete-		-Est At Complete-	-----Budget-----		
Code	Description	Status	Prof. Hours	Total Cost	Prof. Hours	Total Cost	Prof. Hours	Total Cost	Prof. Hours	Total Cost
Design Support Activities: 65602DS										
PM	Project Management	P	0	0	64	5498	64	5498	0	0
GM	Groundwater Monitoring Plan	P	0	0	416	32617	416	32617	0	0
LS	Landfill Cap Support	P	0	0	84	6687	84	6687	0	0
MG	Meetings (External)	P	0	0	140	11357	140	11357	0	0
MS	Miscellaneous Support	P	0	0	80	6063	80	6063	0	0
QC	Quality Control	P	0	0	64	5674	64	5674	0	0
ZZ	General	P	0	0	0	0	0	0	0	0
Total			0	0	848	67896	848	67896	0	0
Prefinal/Final Design: 65602FD										
SL	Construction Schedule Development	P	0	0	382	28707	382	28707	0	0
PM	Project Management	P	0	0	196	16272	196	16272	0	0
DS	Plans and Specifications	P	0	0	300	22837	300	22837	0	0
EC	Estimates - Cost	P	0	0	224	16872	224	16872	0	0
GT	Groundwater Treatment Design	P	0	0	1160	91509	1160	91509	0	0
GX	Groundwater Extraction Design	P	0	0	328	26563	328	26563	0	0
IT	Insitu Treatment Design	P	0	0	584	47626	584	47626	0	0
MG	Meetings (External)	P	0	0	100	8219	100	8219	0	0
ML	Manuals - Operations and Maintenance	P	0	0	272	20961	272	20961	0	0
QC	Quality Control	P	0	0	160	15014	160	15014	0	0
ZZ	General	P	0	0	0	0	0	0	0	0
Total			0	0	3706	294580	3706	294580	0	0
Project Closeout: 65602PC										
PC	Project Closeout Procedures	P	0	0	100	6933	100	6933	0	0
ZZ	General	P	0	0	0	0	0	0	0	0
Total			0	0	100	6933	100	6933	0	0
Preliminary Design: 65602PD										
C1	Civil Engineering Design - Geotechnical	P	0	0	60	10345	60	10345	0	0
EC	Estimates - Cost	P	0	0	120	7823	120	7823	0	0

Internal Projects, Tasks, Milestones Excluded.
 * With invoiced fee only (see PRJ090 for Total with estimated full fee).

Client Proj No.: 38-5NL5
 Master Project: 6560200

Micro Workplan
 Project Summary (Includes Fee)
 Onalaska Municipal Landfill, WI
 KEITH S M

Report PRJ200
 Page 2
 Run Date: 04/17/91
 Run Time: 14:37:55
 As Of: 03/91

T A S K
 Code Description

		Status	-Project To Date-		-Est To Complete-		-Est At Complete-	-----Budget----		
			Prof. Hours	Total Cost	Prof. Hours	Total Cost	Prof. Hours	Total Cost	Prof. Hours	Total Cost
Preliminary Design: 65602PD (con't)										
H1	Haz Waste Design - Process Eng	P	0	0	638	56261	638	56261	0	0
H6	Haz Waste Design - Advanced Tech	P	0	0	544	50131	544	50131	0	0
HS	Health and Safety	P	0	0	48	4028	48	4028	0	0
MG	Meetings (External)	P	0	0	80	6403	80	6403	0	0
PM	Project Management	P	0	0	148	11348	148	11348	0	0
QC	Quality Control	P	0	0	84	6501	84	6501	0	0
QS	QAPP/SSP/FSP	P	0	0	240	18477	240	18477	0	0
R7	Report - Predesign	P	0	0	264	19988	264	19988	0	0
Total			0	0	2226	191305	2226	191305	0	0
Project Planning - RD: 65602PP										
ED	Existing Data Review	P	0	0	40	2884	40	2884	0	0
PM	Project Management	A	2	255	158	15257	160	15512	8	500
PP	Project Planning General	A	35	2569	5	672	40	3241	14	790
QC	Quality Control	A	0	0	24	2088	24	2088	8	450
WP	EPA Workplan	A	74	4866	68	6547	142	11413	70	4260
ZZ	General	A	0	0	0	0	0	0	0	0
Total			111	7690	295	27448	406	35138	100	6000
Master Project Total			111	7690*	7175	588162	7286	595852	100	6000

Internal Projects, Tasks, Milestones Excluded.

* With invoiced fee only (see PRJ090 for Total with estimated full fee).

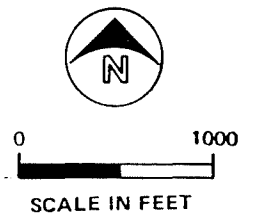
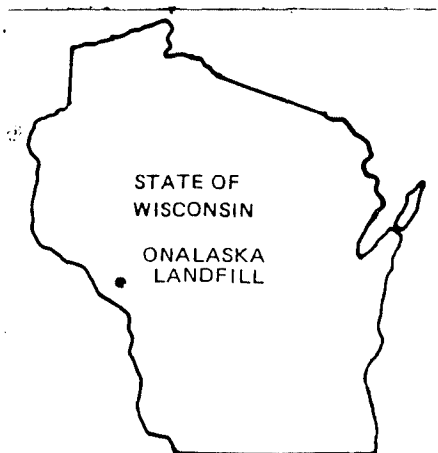
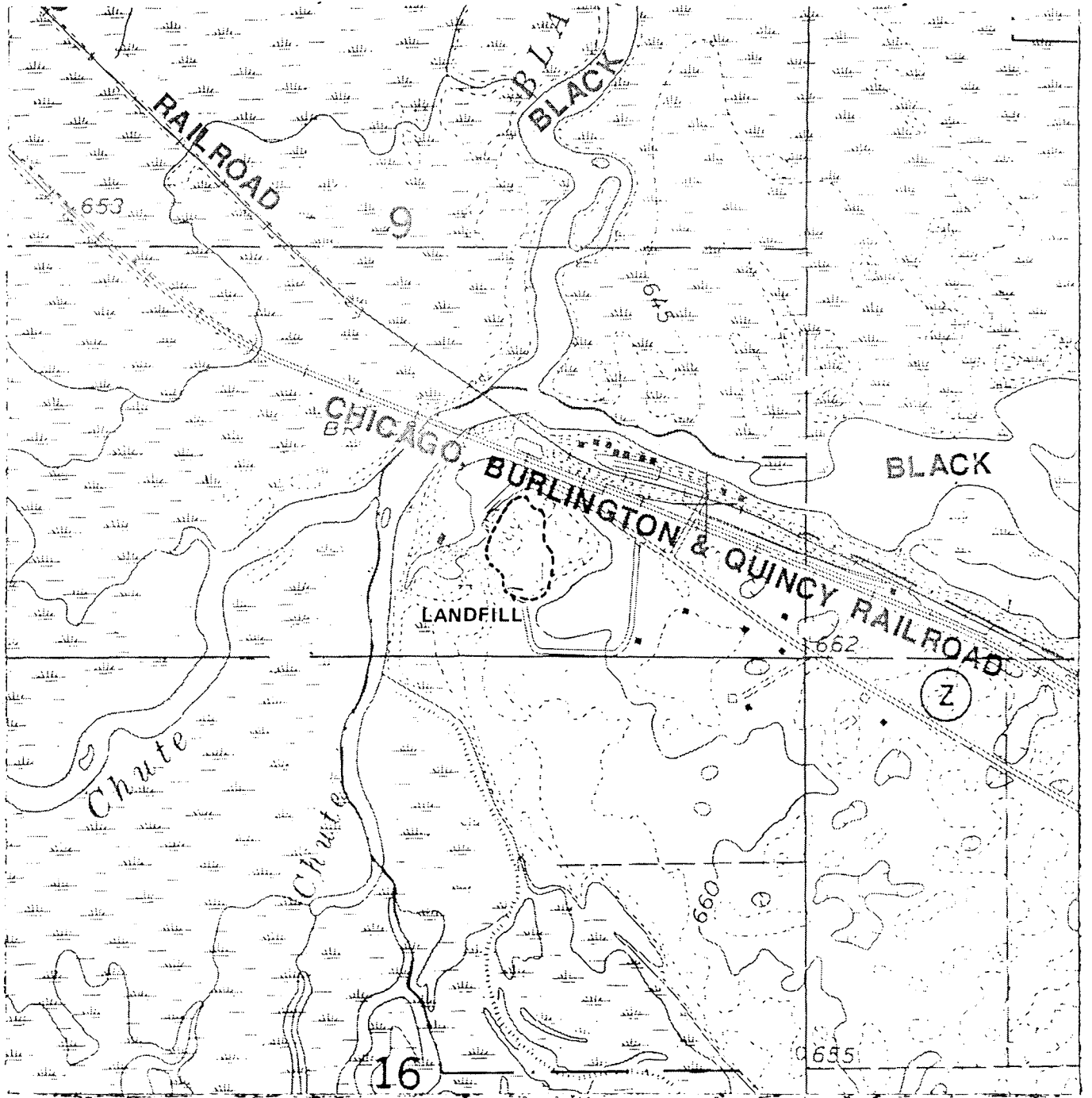


Figure 1
SITE LOCATION MAP
 Onalaska Remedial Design Work Plan

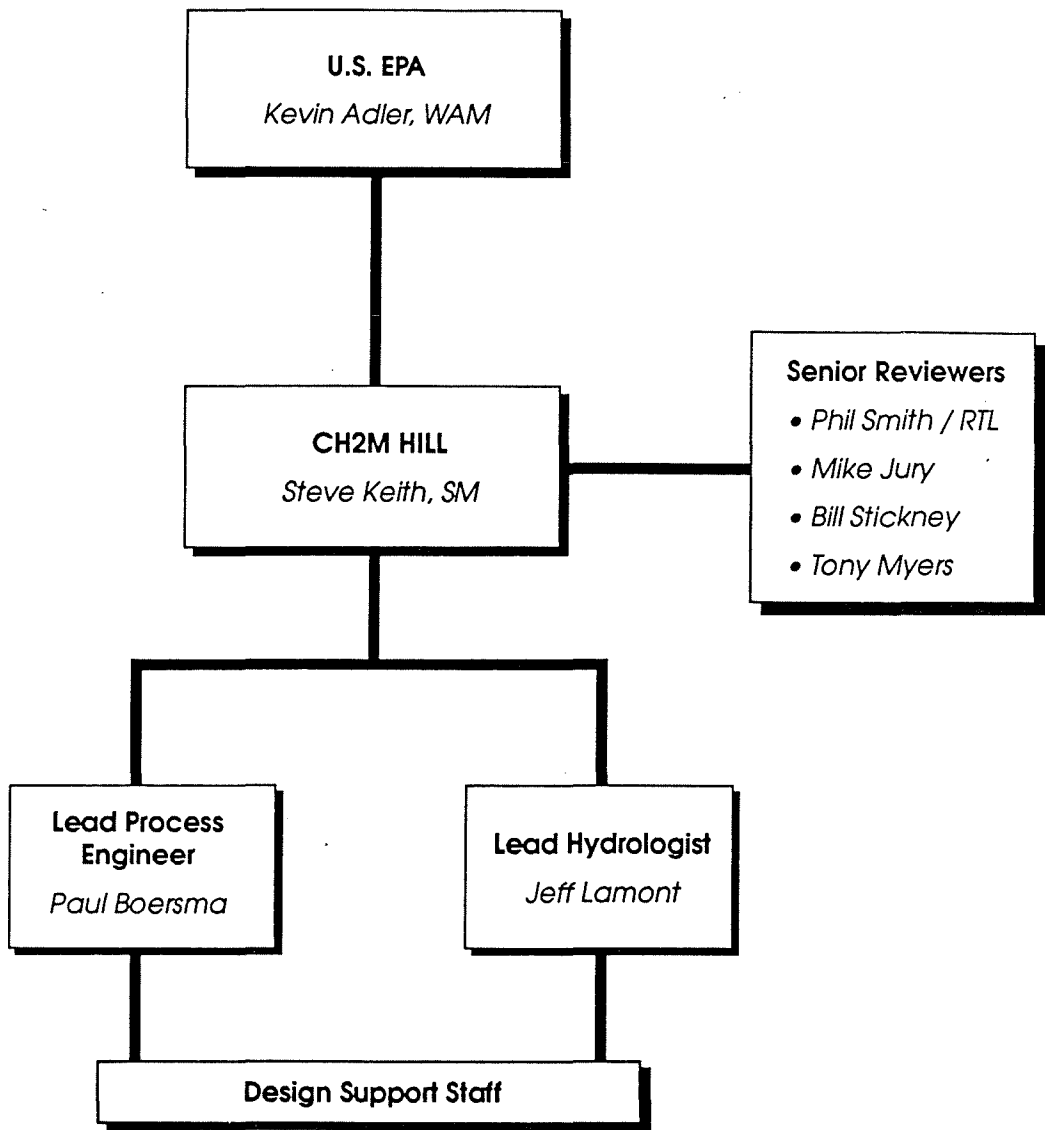
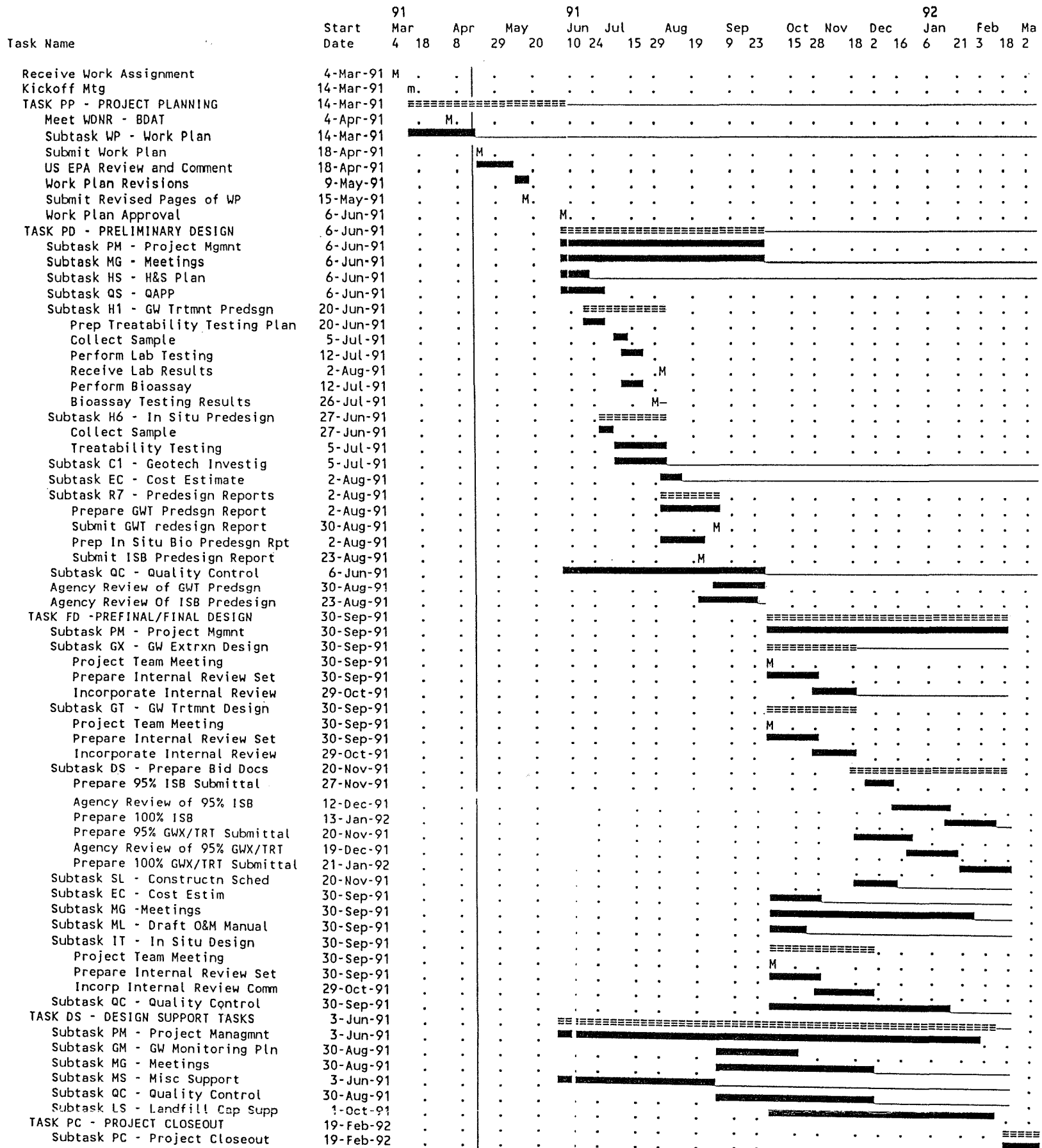


Figure 2
PROJECT ORGANIZATION CHART
 Onalaska Remedial Design Work Plan

ONALASKA REMEDIAL DESIGN SCHEDULE

Responsible :
 As-of Date : 16-Apr-91 9:00a Schedule File : WPSCHED



■ Detail Task ■■■■■ Summary Task ○○○○ Baseline
 ■■■■■ (Progress) ■■■■■ (Progress) >>> Conflict
 ■■■■■ (Slack) ■■■■■ (Slack) .. Resource delay
 Progress shows Percent Achieved on Actual
 M Milestone
 Scale: 3 days per character

Figure 3
PROJECT SCHEDULE