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United States Environmental
Protection Agency

REPORT

Operations and Maintenance Plan
100% Completion

Mid-State Disposal Site
Marathon County, Wisconsin

STS Consultants Ltd.

OPERATIONS AND MAINTENANCE PLAN

100% COMPLETION

OPERATIONS AND MAINTENANCE PLAN

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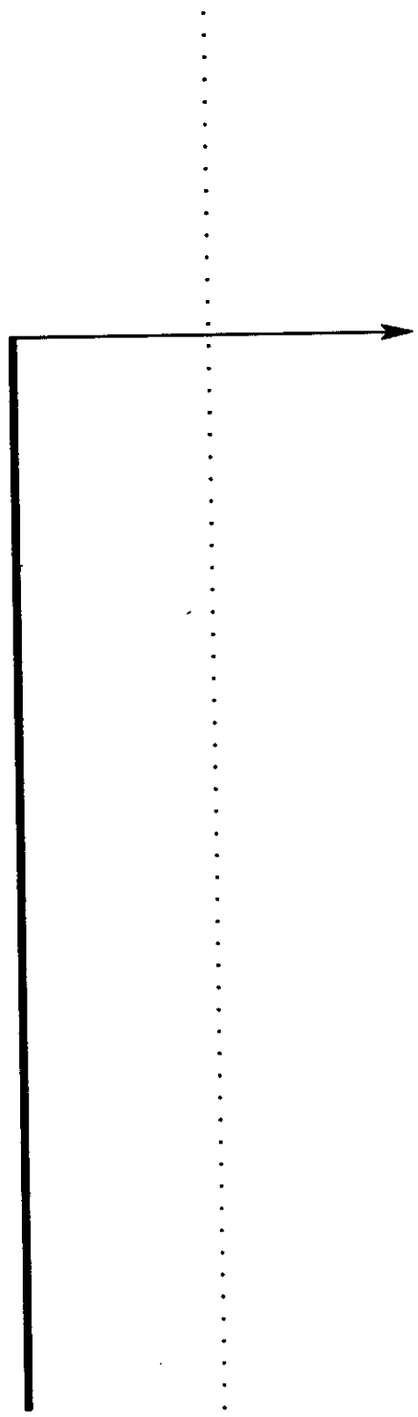

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

On behalf of the Settling Defendants for the Mid-State Disposal, Inc. (Mid-State) site, STS Consultants, Ltd. (STS) has prepared this Operation and Maintenance (O&M) Plan. This Plan is part of the Final (100%) level of the Remedial Design Package for the Mid-State site located in Cleveland Township, Marathon County, Wisconsin. The legal description of the site is the southwest quarter of Section 4, Township 27 North, Range 4 East.

The purpose of this O&M Plan is to identify and discuss the operation and maintenance tasks needed for continued effectiveness of the remedial action (RA) at the Mid-State site. Tasks related to the performance of the landfill covers will be performed subsequent to construction of the landfill cover systems, whereas tasks related to the performance of the sludge lagoon covers will be performed for 30 years subsequent to construction of the second phase of the sludge lagoon.

This plan was prepared in accordance with the provisions of the Record of Decision (ROD), Consent Decree (CD) and Scope of Work (SOW). The CD, the ROD and the SOW require that the O&M Plan include the following elements:

- Maintain the cover system of the Old Mound landfill, Interim landfill and sludge lagoon.
- Operate and maintain the leachate seep and gas condensate collection system.
- Operate and maintain the gas extraction system.
- Maintain the groundwater monitoring wells and associated structures and equipment.
- Maintain the surface water drainage system, access roads, and fencing around the facility.
- Monitor and test groundwater, surface water, leachate, ambient air, residential wells, and landfill gas quality at the perimeter probes and the gas extraction system.

- Alternate Water Supply (AWS) maintenance.
- Follow the Site Safety Plan.

1.2 REPORT FORMAT

The operation and maintenance elements identified in the CD, ROD and SOW are addressed in this O&M Plan with the exception of the AWS and the Site Safety Plan. The AWS operation and maintenance will be addressed after an AWS is selected, and will be submitted under separate cover. The Site Safety Plan is being submitted as a separate document to the Final (100%) level of the Remedial Design Package.

This section (Section 1.0) comprises the Introduction. Section 2.0 provides definitions and identification of the responsibilities and authority involved in the O&M. Section 3.0 outlines the reporting requirements to be followed. Section 4.0 describes the final cover system O&M including the groundwater and surface water monitoring systems. The leachate seep and gas condensate collection system O&M is discussed in Section 5.0 while the gas extraction system O&M is discussed in Section 6.0. Finally, Section 7.0 discusses the documentation of financial assurance of the Settling Defendants to fund the O&M of the Mid-State site as described herein. In addition, each operating system section discusses potential operating problems, possible remedial actions and the associated costs for the O&M including the monitoring and testing costs. Tables 1 through 14 present O&M schedules and costs and Figures 1 through 12 present inspection and corrective action forms.

1.3 LONG-TERM MANAGEMENT AND CARE RESPONSIBILITY

The Settling Defendants recognize that they have an obligation to assure the long-term management and care for the Mid-State site according to the CD. One (1) of the mechanisms that they are pursuing to meet this obligation is establishment of a functioning trust to perform the long-term operations and maintenance. Any mechanism or entity selected will be subject to the approval of the Agencies.

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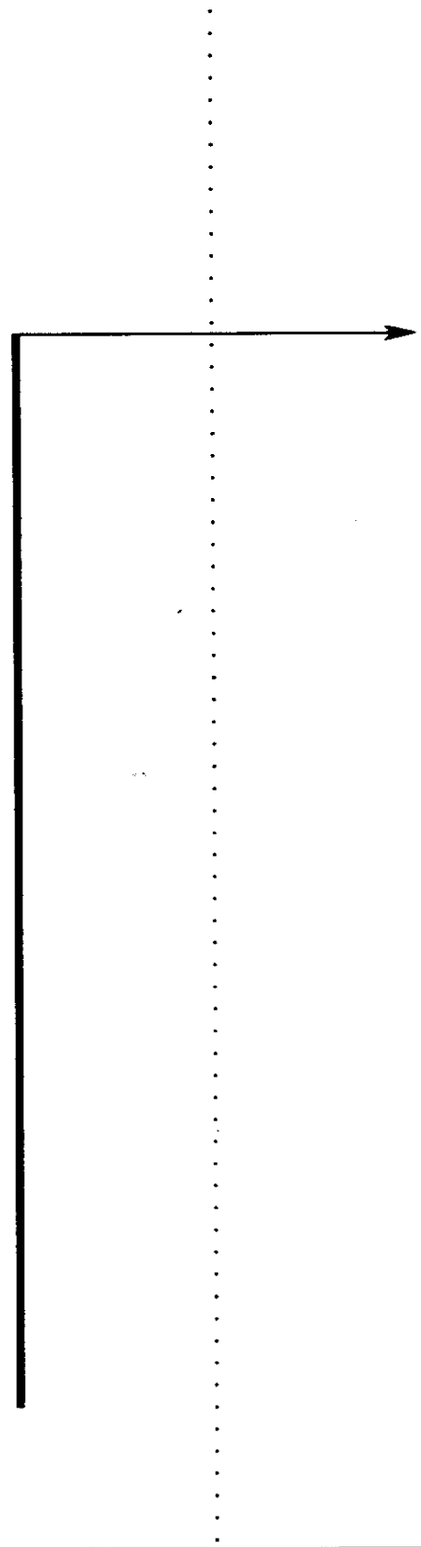

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2.0 DEFINITIONS

For the purpose of this plan, the following terms will have the defined meaning unless the context clearly states otherwise. The responsibilities and authority of the identified parties involved in the operation and maintenance of the Mid-State site are included in the following definitions, where appropriate.

- Project Plans and Specifications - The approved Remedial Action Design drawing set, project plans, technical specifications, and supporting documents.

- Post Closure Period - The Post Closure Period for the landfills will be 30 years from construction of the landfill covers, and the Post Closure Period for the sludge lagoon will be 30 years from completion of construction of the final sludge lagoon cover. Since the sludge lagoon will be constructed in two (2) phases, the Post Closure Period will be initiated upon completion of the second phase of construction. Therefore, the 30-year period for the landfills will start in Winter 1993/Spring 1994 assuming 1993 construction, the 30-year period for the sludge lagoon will start in the Fall 1994/Winter 1995 assuming Spring 1994 construction.

- Settling Defendants - Those parties, other than the United States of America Environmental Protection Agency (USEPA) and the State of Wisconsin Department of Natural Resources (WDNR), that have executed the Consent Decree. This group is responsible for operation and maintenance of the remedial action effort.

- Settling Defendants' Representative - The individual or group designated by the Settling Defendants to oversee the implementation of the O&M Plan. The Settling Defendants' Representative will also be responsible for maintaining quality control during the implementation.

- Design Engineer - The individual(s) or firm(s) retained by the Settling Defendants to prepare and/or review designs and plans for repairs or maintenance programs that may be implemented during the Post Closure Period. The Design Engineer will have responsibility for reviewing corrective action designs and activities and evaluating consistency with the Final Project Plans and Specifications.

- Contractor(s) - The individual(s) or firm(s) retained by the Settling Defendants to perform the O&M and routine monitoring. The Contractor(s) will also be responsible for evaluating the inspection and testing data and for submitting reports containing summaries of the data and evaluations to the Settling Defendants' Representative, USEPA and WDNR.

- Final Cover System - The areas of the Old Mound landfill, Interim landfill and sludge lagoon that are to be capped per the Consent Decree and as shown in the Drawing Set.

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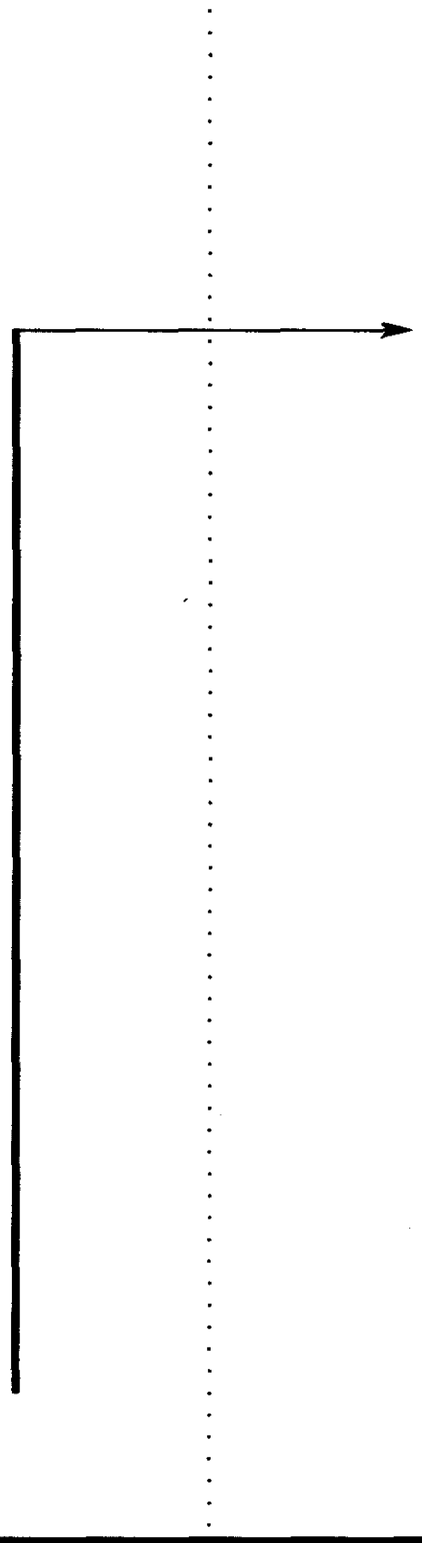

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3.0 REPORTING PROCEDURES

The following sections describe reporting procedures for operation and maintenance activities during the Post Closure Period.

3.1 NOTICES

Whenever notice is required to be given or a report or other document is required to be forwarded by one party to another in accordance with the provisions of this O&M Plan. the communication. notice or report will be directed. in writing. to the following individuals at the addresses specified below (or to such other addresses as such individual may. from time to time. designate by written notice):

USEPA:

1) Office of Director. Waste Management Division
Remedial Project Manager
United States Environmental Protection Agency
77 West Jackson Boulevard
Chicago. IL 60604-3590

Attn: Mid-State Disposal. Inc. Landfill
Mr. Samuel F. Borries (HSRW-6J)
(312) 353-3156

WDNR:

1) Wisconsin Department of Natural Resources
101 South Webster
P.O. Box 7921
Madison. WI 53707-7921

Attn: Mr. Mark Giesfeldt
(608) 267-7562

2) Wisconsin Department of Natural Resources
101 South Webster
P.O. Box 7921
Madison. WI 53707-7921

Attn: Mr. Thomas Eggert
(608) 264-6012

3) Wisconsin Department of Natural Resources
1681 Second Avenue
Room 118
Wisconsin Rapids. WI 54494

Attn: Mr. Donald R. Grasser
(715) 481-7840

Settling Defendants:

1) Foley and Lardner
777 East Wisconsin Avenue
Milwaukee. WI 53202-5367

Attn: Mr. Mark A. Thimke. Esq.
(414) 271-2400

2) Foley and Lardner
First Wisconsin Plaza
1 South Pinckney Street
P.O. Box 1497
Madison. WI 53701-1497

Attn: Mr. Bradley D. Jackson. Esq.
(608) 258-4262

3) Settling Defendants' Representative or Design Engineer
STS Consultants. Ltd.
11425 West Lake Park Drive
Milwaukee. WI 53224

Attn: Ms. Jeanne M. Tarvin
Mid-State Project Manager
(414) 359-3030

4) Weyerhaeuser Company
3363 Weyerhaeuser Way South
Tacoma. WA 98003

Attn: Mr. James P. Odendahl
(206) 924 - 6361

3.2 PROGRESS REPORTS

Written progress reports will be completed per Section XIV of the CD and Section 11.0 of the Design Report. These reports will detail the operation and maintenance and monitoring progress. The Settling Defendants' Representative will provide progress reports which will include. as appropriate. the following:

- Summarize and describe the activities completed or in progress during the previous month.
- Include all results of sampling and tests and all other supporting data received by the Settling Defendants' during the course of the Work.
- Include all plans and procedures completed under the RD/RA Work Plan during the previous month.
- Describe all actions, testing, and plans which are scheduled for the next month and provide other information relating to the progress of construction.
- Include information regarding percentage of completion, unresolved delays encountered or anticipated which may affect the future schedule for implementation of the Pre-design and RD/RA Work Plans or the Work, and a description of efforts made to mitigate those delays or anticipated delays.

The progress reports will be submitted to the Settling Defendants' Representative, USEPA and WDNR monthly for the duration of the RA construction. Thereafter, progress reports will be submitted on a quarterly basis, unless more or less frequent reports are required. However, under no circumstances will the required reporting be more frequent than monthly. The frequency of the progress reports after remedial construction may be adjusted based on the 5-year Performance Evaluation Reports (see Section 3.5). Agency review and approval of any adjustment in the frequency of reporting is required.

3.3 EMERGENCY REPORTING

In the event that reporting to the National Response Center, as per Section 103 of CERCLA 42 U.S.C 9603 is required, the Contractor will promptly notify, by telephone, the USEPA Remedial Project Manager (RPM). If the RPM is unavailable, the Emergency Response Branch - Region V - USEPA will be contacted (telephone number: (312) 353-2318).

Within twenty (20) days of such an event, a written report will be completed and submitted to the USEPA and the WDNR. The report will discuss the chain of events that occurred and the measurements to be taken.

Within thirty (30) days of the conclusion of such an event. a report will be completed and submitted to the USEPA and WDNR. This report will summarize and discuss all actions taken in response to the event and measures taken to prohibit such events in the future.

3.4 INCIDENT REPORT

If an abnormal condition as described in Sections 4.0. 5.0 and 6.0 of this Plan is identified during an inspection or during the scheduled monitoring activities. but is not an emergency as defined in Section 3.3. the Contractor(s) will notify the Settling Defendants' Representative immediately and submit an Incident Notification Form (See Figure 1) within 24 hours. The Settling Defendants' Representative will then notify the USEPA and WDNR within 48 hours of the discovery of the problem. The Settling Defendants' Representative will submit a description of proposed remedies for the Design Engineer review and USEPA and WDNR approval within 10 working days of the notification of the incident. Corrective actions will be initiated by the Contractor(s) within three (3) working days after verbal approval.

3.5 PERFORMANCE EVALUATION REPORT

A Performance Evaluation Report will be completed once every 5 years after completion of the RA construction. These reports will contain. at a minimum. the following:

- Compilation of monitoring data for the groundwater. surface water. gas and leachate monitoring systems. A summary of water elevation data and leachate quantities removed will also be included.
- Assessment of temporary trends in the data.
- A discussion of any monitoring level exceedances and corrective actions taken.
- Proposed changes for sampling frequency. parameters and reporting. The justification for reduced or increased sampling frequency. parameters and reporting will be required.
- A discussion of the continued operation of the active gas extraction system.

3.6 STORAGE OF RECORDS

Original field forms generated during the operation and maintenance period will be stored in the Final Evidence File by the Settling Defendants' Representative. Copies will be provided to the USEPA, WDNR and the Settling Defendants upon request. Documents will be stored and maintained during the pendency of the CD and for a period of six (6) years after its termination.

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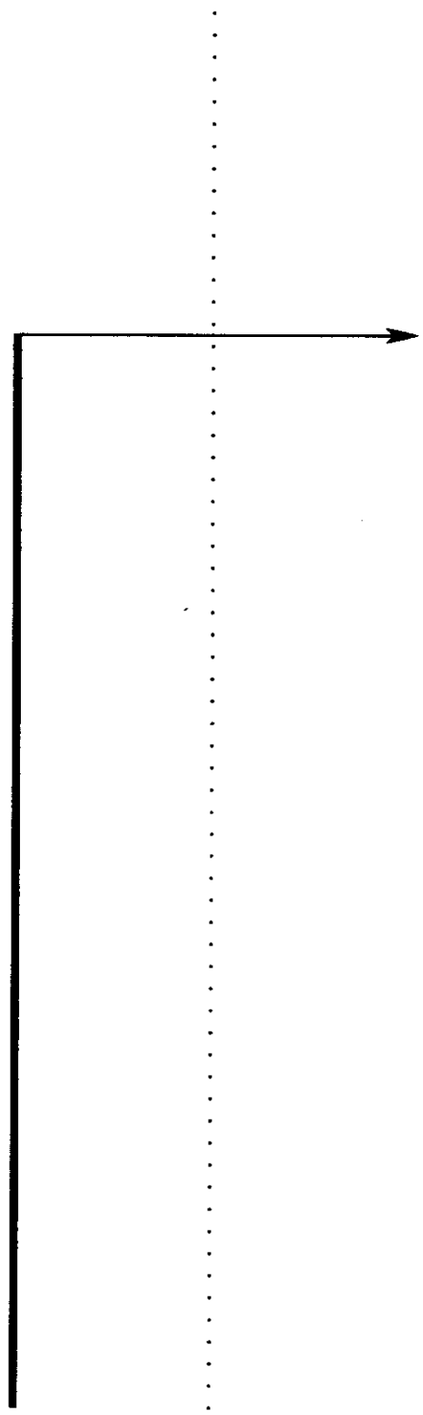

4.0 FINAL COVER SYSTEM

Operation and maintenance activities for the final cover system will be performed during the Post Closure Period. The following sections discuss the normal operation and maintenance, routine monitoring and testing, incident monitoring, identification and correction of potential problems, and the associated operation and maintenance costs for the final cover system as well as the groundwater and surface water monitoring systems.

4.1 NORMAL OPERATION AND MAINTENANCE

The Contractor(s) will be responsible for the final cover systems and the groundwater and surface water monitoring systems' normal operation and maintenance activities and corrective actions required for the duration of the Post Closure Period. These activities will include: routine maintenance activities, operation and maintenance inspections, and corrective action measures for problems identified during the inspections which are described in the following sections. Personal monitoring and appropriate levels of personal protection during operation and maintenance activities are discussed in the Health and Safety Plan.

4.1.1 Routine Maintenance

Routine maintenance of the final cover system will include periodic mowing of the vegetative cover. Mowing will minimize the growth of weeds that could displace the grass or woody species which could threaten the integrity of the cover. In addition, observed large weeds and woody species will be cut during the periodic inspections (Section 4.1.2).

The vegetative cover will be mowed four (4) times the initial full growing season if weather and vegetative cover conditions are favorable for mowing. Mowing will not be performed if more harm than benefit will result. If weather or vegetative growth conditions preclude mowing, the Settling Defendants Representative will notify the USEPA Remedial Project Manager and the WDNR Project Manager in writing. The written document will outline the reasons that mowing will not be performed.

Thereafter, it will be mowed annually in the growing season for the next two (2) years of the Post Closure Period, and at least once every five (5) years thereafter for the duration of the Post Closure Period (see Table 1). For each mowing, a Routine Maintenance Form (see Figure 2) will be completed and submitted with the Progress Report for that reporting period. Mowing will not be performed during wet conditions because rutting may occur which can lead to severe erosion. In addition, mowing will be performed along contours, instead of parallel with the slope, to minimize erosion due to elongated ruts running with the slope. In addition, mowing will not be performed prior to establishment of vegetative cover. An attempt will be made to mow the vegetative cover prior to initiation of operation and maintenance inspections of the cover to facilitate visual observations, if possible.

4.1.2 Operation and Maintenance Inspections and Corrective Action

The final cover systems will be inspected annually for the duration of the Post Closure Period (see Table 2). Requests to adjust the inspection/survey frequency will be included in the Progress Report. Agency review and approval of the adjustment in frequency will be required.

Inspections will be performed after mowing is performed (see Section 4.1.1), if possible. During each inspection, the condition of various site features will be documented. These include: the site security fences, access roads, cover vegetation, surface drainage and erosion control, cover settlement, gas control, and survey benchmarks. Groundwater monitoring wells will also be inspected annually. In addition, sampling personnel will visually note the condition of monitoring devices (monitoring wells and staff gauges) each time the device is utilized or a water elevation is measured.

Final Cover System Inspection Forms (see Figures 3A through 3E) and Monitoring Well Integrity Forms (see Figures 4A and 4B) will be completed and submitted with the Progress Report for that reporting period. Areas requiring attention or corrective action measures will be clearly identified and located on a site plan attached to each inspection form.

Corrective action maintenance will be scheduled within one (1) month of the inspection. if required. Corrective Action Forms (see Figures 5A and 5B) will be completed and submitted with the Progress Report for that reporting period.

The following sections describe each of the inspection activities. potential problems. and possible corrective action measures in detail. The Inspector will document the condition of each item on these forms as either adequate or requiring further attention and the possible corrective actions to be taken.

4.1.2.1 Site Security - The perimeter fence will be inspected for holes or breaks and the condition of the gate and lock will be evaluated. In addition. the number and condition of the posted signs will be documented.

On the Final Cover System Inspection Form. sections of the perimeter fence which require maintenance will be identified. Corrective actions may include replacement of missing or damaged posted warning signs and repair or replacement of fencing sections. gates or locks. as necessary.

4.1.2.2 Site Access - The condition of the access road will be inspected. The road base will be inspected for washouts and any obstructions will be identified.

On the Final Cover System Inspection Form. sections of the access road that require repair will be identified. Corrective action may include regrading or importing and placing gravel.

4.1.2.3 Vegetation - The quality and density of the cover vegetation will be qualitatively evaluated on the top and side slopes of the landfills. sludge lagoon. and the drainage swales. In addition. the cover vegetation will be inspected for rodent damage. invasion by weeds and/or woody species. and evidence of leachate seep damage or gas migration stress.

On the Final Cover System Inspection Form, areas that require corrective action will be identified. Corrective actions may include re-seeding, fertilization, mowing, weed and woody species removal, and/or control of burrowing animals to protect the integrity of the grass cover.

4.1.2.4 Surface Drainage and Erosion Control - The final cover system will be inspected for evidence of erosion depressions or other obstructions which may restrict drainage of surface water off the cover. The effectiveness of surface drainage and the extent of erosion will be inspected and evaluated on the top slope and each of the side slopes.

In addition, the condition of the drainage swales, culvert pipes and rip-rap apron end walls will be evaluated. The swales will be inspected for obstructions and erosion problems. The inlet to the culverts and the culvert barrels will be inspected for obstructions and the outlets will be inspected for erosion. The culvert inlet areas will be inspected for excessive silt accumulation which may result in loss of design flow capacity. The rip-rap aprons will be inspected for wash-out and loss of rip-rap material.

On the Final Cover System Inspection Form, areas in need of maintenance will be identified. Corrective actions may include filling of erosion rills and gullies, local revegetation, removal of obstructions from the ditch and culvert, and repair of the rip-rap aprons.

4.1.2.5 Settlement - The final cover system will be inspected for signs of settlement which may restrict surface water drainage or which may threaten the integrity of the final cover system. Depressions and grade reversals in the cover slope will be identified and located. Notes on the inspection reports will include the dimensions of areas of concern and estimates of the vertical extent of any settlement. Settlement of the sludge lagoon will be monitored by surveying the settlement hubs on the sludge lagoon.

On the Final Cover System Inspection form, areas of the cover which require maintenance due to differential settlement will be identified. Where appropriate, corrective actions may include filling, regrading, and/or revegetation as necessary to prevent ponding and increased infiltration.

4.1.2.6 Survey Benchmarks - Benchmarks used as survey reference points will be inspected for signs of tampering or disturbance. In addition, the accessibility and legibility of information on the benchmarks will be checked.

On the Final Cover System Inspection Form, the need for maintenance of the survey benchmarks and settlement hubs will be identified. If there are obvious signs of tampering or disturbance, the coordinates and elevations of the benchmarks or hubs will be checked by re-survey.

4.1.2.7 Monitoring Wells - Monitoring wells will be evaluated for signs of tampering, disturbance or ground settlement/upheaval of the well pipe and/or casing. Any evidence of such physical damage or need for maintenance will be identified on the Monitoring Well Integrity Form during the annual inspection or will be noted on the Well Sampling Form or Water Level Summary Form (see Field Sampling Plan for forms) during groundwater sampling events or measurements of water elevations.

If for any reason a monitoring device is destroyed or otherwise fails to function properly based on the inspection, the Settling Defendants' Representative will notify the WDNR and USEPA in writing within 10 days after discovery. The device will be repaired if possible. If the device cannot be repaired, it will be properly abandoned and replaced within 60 days unless otherwise approved in writing by the WDNR. Unless otherwise approved, if a device is replaced, the replacement well will be given the same number as the well it replaced followed by the letter "R" to indicate it is a replacement well. An additional "R" will be added each time the well is replaced. Documentation of replacement (abandonment and installation) should be submitted to the WDNR and USEPA within 60 days of well or probe installation.

4.2 GROUNDWATER AND SURFACE WATER MONITORING AND TESTING

4.2.1 Groundwater

The Contractor(s) will be responsible for the monitoring and testing of the groundwater for the duration of the Post Closure Period. This will involve monitoring the

groundwater elevations at the on-site monitoring wells (including MW-19) and analyzing groundwater samples from the wells listed below (see Figure 6). However, upon completion of the Alternate Water Supply Scope of Work, the number of residential wells to be included in the long-term monitoring program shall be evaluated based on data obtained from that study. After the evaluation, these wells shall be incorporated into the long-term monitoring program.

Pre-design wells: MW-22S, MW-22D, MW-23, MW-24S, MW-24D, MW-26S, and MW-26D.

Four (4) wells constructed for the Alternate Water Supply Scope of Work: MW-29, MW-30, MW-31S, and MW-31D.

Remedial Investigation Wells: MW-6, MW-10, MW-14 and MW-17.

Two (2) residential wells: Krall's and Hamann's.

These points will be monitored quarterly for the first two (2) years and semi-annually thereafter (see Table 3). In addition, all functioning monitoring wells will be monitored every 5 years. The monitoring program will be re-evaluated during the 5-Year Performance Review and may be adjusted upon approval of the USEPA and WDNR (see the Field Sampling Plan attached to the Quality Assurance Project Plan (QAPP) for detailed discussion).

Groundwater elevations will be measured and samples will be tested for field parameters (color, odor and turbidity), indicator parameters (field temperature, pH and conductivity; alkalinity; COD; total hardness; ammonia nitrogen; chloride; dissolved iron; sulfates; and nitrates and nitrites as N), eight (8) RCRA metals and volatile organic compounds (VOCs). Every 5 years, all functioning wells will be sampled and tested for the above mentioned field parameters including pH, VOCs, 8 RCRA metals, temperature and conductivity. In addition, the monitoring wells will be visually inspected for damage during each sampling event. Field sampling and testing will be performed in accordance with the procedures outlined in the Field Sampling Plan and analytical laboratory testing will be performed in accordance with the procedures outlined in the QAPP.

Action levels to be utilized will be the applicable standards set forth in NR140 and are as follows:

- VOCs, RCRA Metals, Chloride, Iron and Sulfates - NR140.10 and NR140.12 action standards for substances of concern for public health and welfare. For those action standards which are below the limit of quantification (5 times the limit of detection), statistical procedures as outlined in NR140.14 will be used to evaluate the data.

- Field pH - One (1) pH unit above or below the pH of the background water quality (NR140.20(2)).

- Field Temperature - Three (3) standard deviations or 10°F, whichever is greater, above or below the temperature of the background water quality (NR140.20(2)).

- Nitrate and Nitrite (as N) - 2 mg/l (NR508, Table 2).

For all other measured indicator parameters, NR140.20(2) states that the PAL will be the background quality for that parameter plus three (3) standard deviations or the background water quality plus a pre-specified increase, whichever is greater. The following is a list of the indicator parameters with their corresponding prespecified minimum increases in accordance with NR140.20(2)(c):

- Field Conductivity - Background value plus 200 micromhos/cm.

- Alkalinity and Total Hardness - Background value plus 100 mg/l.

- Ammonia Nitrogen - Background value plus 2 mg/l.

- COD - Background value plus 25 mg/l.

Background groundwater quality will be established by sampling the background wells and averaging eight (8) rounds of sample results from each well. This sampling has been initiated as part of the Alternate Water Supply Scope of Work. The background groundwater quality sampling requirements are detailed in NR508.14, Wisconsin Administrative Code.

In the event that an action level is attained or exceeded, the USEPA and the WDNR will be notified in the Progress Report for that period as per NR140.14(c), NR140.24, NR140.26, NR508.17 and the CD. This notification will specify the parameters for which standards have been exceeded and the wells at which the exceedance occurred. The analytical results will be reported along with the limit of detection and the limit of quantitation. This notification will also include a preliminary analysis of the cause and significance of the concentrations.

As per Section VIII of the CD, the USEPA, in consultation with the WDNR, may require a maximum of two (2) phased feasibility studies, one (1) for the shallow aquifer and one (1) for the deep aquifer (bedrock), if an action level is exceeded in accordance with the trigger mechanisms outlined in Section VIII of the CD. If the USEPA and WDNR require that a phased feasibility study is necessary based on these trigger mechanisms, a Phased Feasibility Study Work Plan will be submitted within 60 days as per Section VIII of the CD. This Work Plan will be written in accordance with USEPA guidelines in effect at that time. Within 30 days after USEPA approval of the Work Plan, the Phased Feasibility Study work will commence. After completion of the work, a Phased Feasibility Study Report will be prepared and submitted to the USEPA and the WDNR by the date set forth in the Work Plan. Based on the completed and approved Phased Feasibility Study Report and any other information determined to be necessary and/or relevant by USEPA, USEPA will sign a ROD containing a selected remedial action alternative for groundwater that is consistent with CERCLA, 42 U.S.C. Section 9601 et. seq.

4.2.2 Surface Water

The Contractor(s) will be responsible for the monitoring and testing of the surface water for the duration of the Post Closure Period. This will involve sampling four (4) surface water locations (see Figure 6). These points will be monitored quarterly for the first year and semi-annually thereafter (see Table 3). If insufficient flow or frozen conditions prevent sampling, sampling will be resumed at the next sampling event. Monitoring will be re-evaluated during the 5-Year Performance Review and may be adjusted upon approval of the USEPA and WDNR (see the Field Sampling Plan attached to the QAPP.)

Surface water samples will be tested for the same parameters as groundwater. Field sampling and testing will be performed in accordance with the procedures outlined in the Field Sampling Plan and analytical laboratory testing will be performed in accordance with the procedures outlined in the QAPP.

Action levels to be utilized will be the background value of the upstream sample plus three (3) standard deviations for field and laboratory parameters except for pH when

compared to the tributary sample. The action level for pH will be two (2) pH units above or below the background value.

In the event that an action level is attained or exceeded, the USEPA and the WDNR will be notified in the Progress Report for that period. The analytical results will be reported along with the limit of detection and the limit of quantification (5 times the limit of detection). This notification will also include a preliminary analysis of the cause and significance of the concentrations.

4.3 INCIDENT MAINTENANCE

In the event of an abnormal situation (i.e., massive erosion exposing waste), reporting procedures as described in Sections 3.4, Incident Report), will be followed.

4.4 OPERATION AND MAINTENANCE COST ESTIMATE

Cost estimates for the operation and maintenance of the final cover system and the groundwater and the surface water monitoring systems have been calculated separately for the Post Closure Period. Table 4 presents the cost estimate for the operation and maintenance of the final cover system. The activities for the final cover system included in the cost estimate are as follows:

- Revegetation of disturbed areas.
- Mowing of the landfill areas.
- Rodent control inspection and removal.
- Final cover system inspection.

Table 5 presents the cost estimate for the groundwater and surface water monitoring systems. The activities for the groundwater and surface water monitoring systems included in the cost estimate are as follows:

- Groundwater sampling and testing.
- Surface water sampling and testing.
- 5-Year Performance Reviews.

The following assumptions were made in preparing both cost estimates:

- Cost estimate based on 1992 costs.
- The Post Closure Period begins at the end of 1993 for the landfill O&M activities and the end of 1994 for the sludge lagoon O&M activities.
- The Post Closure Period extends for 30 years.
- The discount rate is equal to 5 percent.
- A contingency of 20 percent is included to account for unexpected events (e.g., a major washout, etc.).

The present value cost for each of the final cover system activities is presented on Table 4, and the present value cost for groundwater and surface water monitoring systems activities is presented on Table 5. The total present value cost for the operation and maintenance of the final cover system is $210.000 and $802.300 (including a 20% contingency) for the groundwater and surface water monitoring activities. These cost estimates do not include costs incurred due to system failures.

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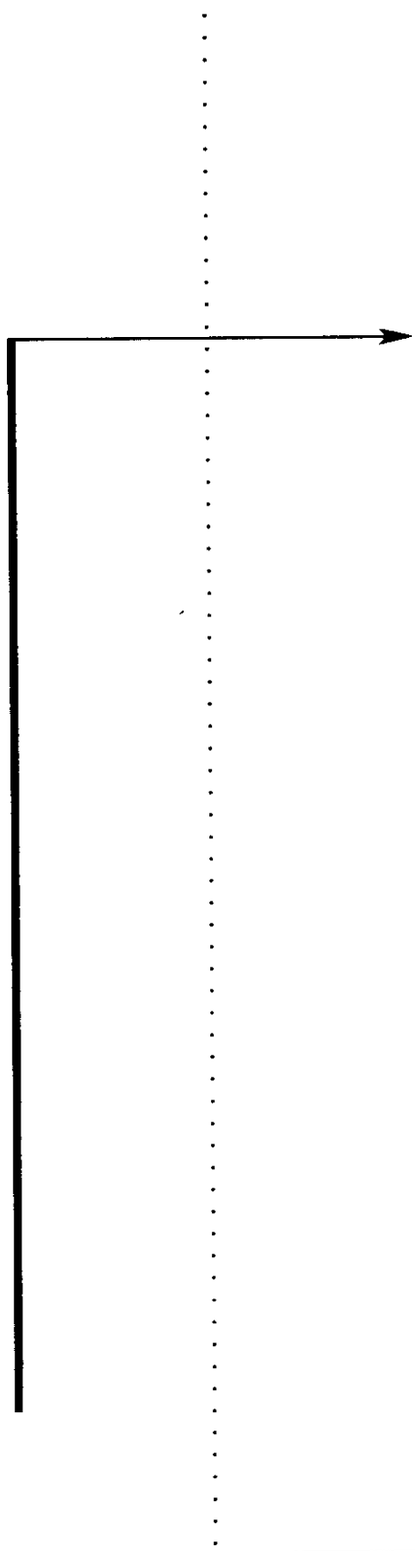


5.0 LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM

Operation and maintenance activities for the Leachate Seep and Gas Condensate Collection System (LSGC System) will be performed during the Post Closure Period. The following sections discuss the normal operation and maintenance activities, routine testing and monitoring, identification and correction of potential problems and the associated costs for the LSGC system.

5.1 OPERATION AND MAINTENANCE

The Contractor(s) will be responsible for the operation and maintenance for the LSGC System and any corrective actions required for the duration of the Post Closure Period. These activities include: routine maintenance, operation and maintenance inspections, and corrective action measures for problems identified during the inspections which are described in the following sections.

5.1.1 Routine Maintenance

Routine maintenance will involve cleaning out the system every three (3) years for the duration of the Post Closure Period (see Table 6). Cleaning the system will involve hydraulically or mechanically sweeping the system. After each system cleaning, a Routine Maintenance Form (see Figure 2) will be completed and submitted with the Progress Report for that reporting period.

In addition, a licensed private hauler will perform the following every two (2) weeks for the duration of the Post Closure Period:

- Pump out the leachate collection tanks.
- Keep a record of the quantity of leachate and gas condensate that is transported from the site. The quantity of leachate and gas condensate transported will be provided in Progress Reports and 5-year reviews.
- Add 20 gallons of water in each of the four (4) drip legs.

5.1.2 Operation and Maintenance Inspections and Corrective Action

The LSGC System will be inspected semi-annually for the duration of the Post Closure Period (See Table 7). Each inspection will include pumps, pipe lines and tanks. LSGC System Inspection Forms (see Figures 7A and 7B) will be completed and submitted with the Progress Report for that reporting period. Items requiring attention or corrective action measures will be clearly identified on each inspection form.

Corrective action maintenance will be scheduled within one (1) month of the inspection, if required. Corrective Action Forms (see Figures 5A and 5B) will be completed and submitted with the Progress Report for that reporting period.

The following sections describe each of the inspection activities, potential problems, and possible corrective actions in detail. The condition of each item on this form as either adequate or requiring further attention and the possible corrective actions to be taken will be documented after each inspection round.

5.1.2.1 Pumps - The pumps and accessory equipment (i.e., float controls, valves, manhole appurtenances, etc.) will be inspected for normal operation and evidence of damage. Additionally, electrical service connection panels will be inspected and the system controls and alarms will be tested.

On the LSGC System Forms, signs of damage or abnormal pump operations will be identified. Corrective actions may include replacement of the valves or controls if they are not operating correctly; repair of malfunctions, leaks or damage in the manholes; or malfunctions in the electrical system.

If the pump is not operating, it will be reported in accordance with procedures described in Section 3.4, Incident Report, of this Plan.

To determine the corrective action for pumping system failure, the cause for failure (power supply failure or a mechanical failure) will be determined. If the power supply has failed, an inspection of the operation of the pumps will be performed immediately

after the power is restored and start-up procedures have been completed. If a mechanical pump failure has occurred, repair or replacement of the failed pump within 72 hours of failure identification will be performed, if parts are available within that time frame. If an alarm has indicated a pump failure or if a pipe line break has been detected, a LSGC System Alarm Response Form (see Figure 8) will be completed and submitted with the Progress Report for that reporting period.

5.1.2.2 Gravity Collection and Forcemain Piping and Manholes - The gravity collection and forcemain piping will be inspected for signs of damage to the pipe. The manholes along the pipe lines will be inspected for obstructions, leaks, odors and evidence of disturbance or gas migration that may be indicated by nearby vegetation stress. In addition, the leachate hauler may notice significantly less than normal volumes of leachate being hauled from period to period which may indicate leakage.

On the System Inspection Form, maintenance or repairs along the pipe lines or at any of the manholes will be identified. Corrective action may include repair of damage. If a pump station alarm indicates a manhole high-high level has been achieved, a LSGC System Alarm Response Form (see Figure 8) will be completed and submitted with the Progress Report for that reporting period.

Leakage from the pipe, including that noticed by the hauler or a pump failure, will be reported in accordance with procedures described in Section 3.4, Incident Report, of this Plan. In addition, if a significant amount of leachate has escaped into the surrounding soil, a work plan detailing a proposed remediation plan will be submitted in accordance with Section 3.4, Incident Report, of this Plan. If leachate is discovered in any manholes designed to be normally dry or if a pump station high-high level alarm is indicated, the source of the leakage into a dry manhole or the cause of the high-high level alarm will be determined, located and repaired. If a pump failure is discovered, the failure will be handled as previously described.

5.1.2.3 Leachate Collection Tanks - The leachate collection tanks will be inspected for signs of damage and leakage. The manways and tank vents will be checked for structural integrity. The interstitial space monitor will be checked for indications of leakage.

On the LSGC System Inspection Form, the need for maintenance or repairs to the tank or its appurtenances will be identified. Corrective actions may include repair of leakage or damage.

If liquid is discovered in the interstitial space of the tanks, it will be reported in accordance with the procedures described in Section 3.4, Incident Report, of this Plan. In addition, if a significant amount of leachate escaped into the surrounding soil, a work plan detailing a proposed remediation plan will also be submitted in accordance with Section 3.4 of this Plan.

5.2 ROUTINE MONITORING AND TESTING

The Contractor(s) will be responsible for routine monitoring and testing of the LSGC system which will be performed during the Post Closure Period. Routine monitoring and testing of the LSGC system will include verification of pump and alarm operations, sampling the leachate, and monitoring air quality in and above the last manhole in the pipeline. These activities are described in detail in the following sections.

5.2.1 Verification of Pump Operation

The performance of the LSGC System will be evaluated when the system is started and annually thereafter for the duration of the Post Closure Period (see Table 8). A Field Inspection Form (see Figure 7B) will be completed and submitted with the Progress Report for that reporting period. The start-up test will include verifying proper operation of all pumps and level controls in the system by performing individual and complete system pump tests.

Annual maintenance will include the following program checks to verify pump operation:

- Check the motor and wiring using an ohmmeter to check the motor amperage draw during pump operation.
- Check the power cord to be sure power cord is not burned off or broken in cord, use ohmmeter for check. The cord should be checked in accordance with manufacturer's instructions.

- Check the seal housing, lower seal and upper seal in accordance with manufacturer's instructions.
- The float switches and cords will be inspected for wear and deterioration.

5.2.2 Leachate Monitoring

A grab sample of leachate will be collected from Dripleg C and Leachate Collection Tank A. In addition, a composite sample will be collected from the Leachate Collection Tank B and the WDNR's UST (see Drawing 82685XI-13). Samples will be collected and tested annually for the first five (5) years (see Table 8). In addition, sampling personnel will visually inspect the monitoring devices during each sampling event. Monitoring frequency and tested parameters will be re-evaluated during the 5-Year Performance Review and may be adjusted upon approval of the USEPA and WDNR (see the QAPP for detailed discussion).

The leachate will be tested for: 1) field parameters (color, odor and turbidity), 2) indicator parameters (field pH, field conductivity, (corrected and uncorrected) alkalinity, total hardness, chloride, dissolved iron, sulfates, ammonia nitrogen, COD, field temperature, and nitrate nitrite as N), and 3) VOCs, eight (8) RCRA metals, copper, nickel and zinc. In addition, the volume of leachate removed from the site will be documented by the leachate hauler when the leachate is hauled off-site. Sampling and testing will be performed in accordance with the Field Sampling Plan.

If the effluent limits at the treatment facility are exceeded and there is no other obvious cause of the increase in effluent concentrations, the leachate quality data will be reviewed. The review will include an evaluation of data trends for consistency. Significant deviations will be identified and evaluated. At this time, Weyerhaeuser will treat the leachate at their treatment facility in Rothschild, Wisconsin; however, for future planning, if Weyerhaeuser is unavailable to treat the water, alternate facilities will be identified. Alternate facilities will be approved by the USEPA and WDNR prior to disposal.

5.2.3 Air Monitoring in the Pipeline Manholes or Tank Manways

Air quality will be monitored in the breathing zone above and within any manholes along the pipeline or tank manways whenever a manhole is to be entered. Confined space entries shall be performed in accordance with the site Health and Safety Plan. if conditions dictate this level of entry.

5.3 OPERATION AND MAINTENANCE COST ESTIMATE

Cost estimates for the operation and maintenance of the LSGC System and the leachate monitoring have been calculated separately for the Post Closure Period. The activities for the LSGC System O&M are included in the cost estimate presented in Table 9 and are as follows:

- Pump inspection and servicing.
- LSGC system inspection.
- LSGC System clean-out.
- Utility usage.

The activities for the leachate monitoring are included in the cost estimate presented in Table 5 and are as follows:

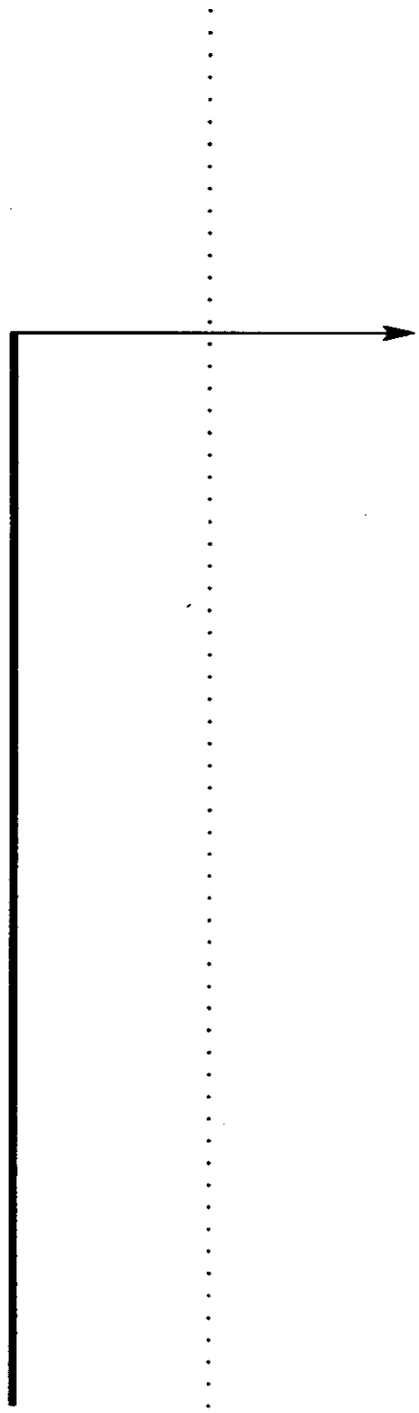
- Leachate sampling and testing.
- 5-Year Performance Reviews.

The following assumptions were made in preparing these cost estimates.

- Cost estimate based on 1992 costs.
- The Post Closure Period begins at the end of 1993 for landfill O&M activities and the end of 1994 for sludge lagoon O&M activities..
- The Post Closure Period extends for 30 years.
- The discount rate is equal to 5 percent.
- A contingency of 20 percent is included to account for unexpected events (e.g.. a major system failure. etc.).

The present value cost for each of the LSGC System O&M activities is presented on Table 9 and the leachate monitoring activities is presented on Table 5. The total present value cost for the operation and maintenance of the LSGC system is $257,700 and $74,100 (including 20% contingency) for the leachate monitoring activities. These cost estimates do not include costs incurred due to system failures.

6.0



6.0 GAS EXTRACTION SYSTEM

Operation and maintenance activities for the gas extraction system will be performed during the initial system start-up phase and for the duration of the Post Closure Period, or until obtaining approval for system shut down from the USEPA and WDNR as a result of the 5-Year Performance Review(s). The system start-up and normal operation and maintenance activities, routine testing, monitoring, identification and correction of potential problems which may occur, and the associated costs are described in the following sections.

6.1 OPERATION AND MAINTENANCE

The Contractor(s) will be responsible for the operation and maintenance of the gas extraction system which will be performed quarterly for the first year, semi-annually for the next two (2) years, then annually for the duration of the Post Closure Period, or until obtaining approval for system shut down from the USEPA and WDNR (see Table 10). The monitoring frequency will be re-evaluated as part of the 5-Year Performance Review. Any adjustment in the sampling frequency will be reviewed and approved by the WDNR and USEPA. In accordance with Section VII 13(c) of the CD, after gas testing has been performed for five (5) years (unless USEPA and WDNR determine a shorter time period is acceptable), the USEPA and WDNR will review the available gas testing results and determine whether or not an active gas extraction system with flaring is required.

The operation and maintenance of the systems will include inspecting and servicing the gas extraction well heads, blower, flare station, and gas collection header. Gas Extraction System Inspection Forms, (see Figures 9A through 9C) will be completed and submitted with the Progress Report for that reporting period. Items requiring attention or corrective action will be clearly identified on each form.

Corrective action maintenance of any items identified on the Inspection Forms will be scheduled within one month of the date of the inspection, if required. A Corrective Action Form (see Figure 5A and 5B) will be completed and submitted with the Progress Report for that reporting period.

The following sections describe the inspection activities, potential conditions which will require further action, and potential corrective actions which are on the Field Inspection Forms. The Inspector will document the condition of each item on these forms as satisfactory or requiring further attention and the possible corrective actions to be taken.

6.1.1 Gas Extraction Well Heads

The gas extraction well/well heads will be inspected for: 1) physical damage such as cracks or holes, 2) the tension and integrity of the flexible hose connecting the gas collection system header or riser to the well head, and 3) the condition of sampling ports and control valves. In addition, well impacts resulting from differential settlement of the refuse or frost heave will be monitored. This condition may result in failure of the flexible hose connecting the gas collection header to the gas extraction well.

On the Inspection Forms, sections of the well/well head requiring maintenance will be identified. The corrective actions may include replacement of missing or damaged components such as valves and flex hoses, and lowering of the well head, if necessary.

Well impacts or other damage which affects the proper operation of the well heads will be reported in the subsequent progress reports.

6.1.2 Blower

The blower and associated equipment (i.e., actuator valves, control panel, etc.) will be inspected for normal operation and for evidence of damage. The inspection will consist of determining if power is being supplied to the blower and the blower is operating correctly.

On the Inspection Forms, signs of damage or abnormal blower operation will be identified. Corrective action may include replacement of the blower motor or fan assembly, repair of breaks or leaks in the piping system: and repair of valves or malfunctions in the electrical system.

If the blower is not operating correctly, it will be reported in the subsequent progress report. To determine the corrective action for blower failure, the cause of the failure (power failure or a mechanical failure) will be determined. If the power supply failed, the cause of the power failure will be determined and the appropriate steps to restore the power will be taken. The blower will be inspected for normal operation after the power is restored and start-up procedures have been completed. If a mechanical failure had occurred, repair or replacement of the failed blower or component will be performed within 5 days of failure identification, if parts are available in that time frame.

6.1.3 Flare Station

The flare station and the associated equipment (i.e., flame arrestor, electrical control panels, guy wires, etc.) will be inspected for normal operation and evidence of physical damage.

On the Inspection Forms, any abnormal flare operation or signs of damage will be identified. Corrective action may include replacement of the flare or associated equipment if they are not operating properly, or repair of malfunctions identified in the flare or associated equipment.

If the flare is not operating correctly, it will be reported in the subsequent progress report.

6.1.4 Gas Collection Header

The gas collection header will be inspected for signs of damage to the pipeline. The pipeline inspection will include observations regarding damage to the exposed portions of the pipeline and disturbances which may indicate damage to the below ground portion of the collection header. The pipeline location markers and warning signs will be inspected for damage or dislocation.

On the Inspection Forms, the need for maintenance or repairs along the gas collection header or at any of the above grade portions of the gas collection header will be identified. Corrective action may include repair or replacement of damaged sections.

Leakage or other damage which affects the proper operation of the gas collection header system will be reported in the subsequent progress report. Situations which would require action are:

- System failure by collapse or restriction of gas flow. System failure could occur due to accumulation of condensate in the header indicated by a reduction in the gas flow and available vacuum or indicated by pulsing available vacuum readings taken during normal system operation tuning. However, unless it occurs in the line connecting the blower flare station to the gas collection header, it should not cause a shut down of the entire system.

- System failure by a break in the header. If a break in the header occurs, the potential exists for outside air to enter into the gas collection system. The entering of the outside (atmospheric) air into the system may result in an explosive condition. This condition would be evidenced by the monitoring of the oxygen levels in the piping above background concentrations at the blower flare station during normal tuning operations, or possibly by a shut down of the flare due to low gas content.

If either of these events occur, the gas extraction system will be shut down, and the Settling Defendants' Representative will be informed by the Contractor(s) of the failure. In addition, the Contractor(s) will visit the site to evaluate and, if possible, correct the situation within 5 days of receiving notification of the failure.

6.2 INITIAL SYSTEM START-UP AND ROUTINE MONITORING AND TESTING

The Contractor(s) will be responsible for initial system start-up and routine monitoring and testing of the gas extraction system. This will be performed for the duration of the Post Closure Period or until obtaining approval for system shut down from the USEPA and the WDNR as a result of a 5-Year Performance Evaluation Review. Routine monitoring and testing of the gas extraction system will include tuning the extraction wells, sampling and testing of the extracted gas, and monitoring the perimeter gas probes. These activities are described in detail in the following sections.

6.2.1 Gas Extraction Well Tuning

The performance of the gas extraction system will be evaluated and adjusted (tuned) when the system is started, weekly for the first two (2) months, bi-monthly for the next

four (4) months, and semi-annually for the next five (5) years (see Table 11). The monitoring frequency will be re-evaluated as part of the 5-Year Performance Review. Any adjustment in the sampling frequency will be reviewed and approved by the WDNR and USEPA.

The system will be tuned to achieve maximum extraction of gas at the wells and trenches. The tuning process will include measuring explosive gas concentrations (methane) and oxygen in each of the well heads. The vacuum applied to each well head will be adjusted to extract the gas at a rate no greater than the rate at which it is generated. The oxygen levels will be monitored at each well to determine if atmospheric air is entering the well head. The system will be tuned so that the maximum volume of gas is extracted with no atmospheric gases (oxygen) drawn into the refuse mass by the extraction wells.

The tuning process will start with the control valves on each well head in the closed position. Each well head control valve will then be opened incrementally until the maximum extraction rate from each well is reached. Once the system has been initially tuned, periodic adjustments of the wells may be required to maintain the optimum level of performance. The fluid levels within in the landfill will be measured from a known survey datum, i.e., the top of the access/sample port, using an electric (battery operated) water level indicator. In addition, the pressure differential across the well head will be measured and temperature readings recorded from the well head thermometer.

The numbering system for designating gas extraction wells (GEW) and trenches (GET) on the field forms is as follows:

- The prefixes GEW-1 through GEW-23 indicate that the well head is attached to a gas extraction well.
- The letters GET-1 through GET-11 indicate that the well head is attached to a gas extraction trench.

Gas Extraction Well Form (see Figures 11A and 11B) will be completed and submitted with the Progress Report for that reporting period. Items that are identified during the tuning process as needing further attention or maintenance will be clearly identified.

The following sections describe the anticipated tuning procedures at system start-up and during normal operation.

6.2.1.1 System Start-Up Procedure - On Day One (1) of the system start-up, a vacuum gauge will be connected to one of the sample monitoring ports on the PVC portion of each well head assembly. The pressure gauge will be capable of measuring from 0 to 30 inches of water column pressure/vacuum. The initial gauge reading will be designated as the pre-extraction level P. This procedure will be carried out twice. The first measurement will occur during mid-morning hours and the second measurement during mid-afternoon hours. The measurements for both events will be taken in the same order. The temperature of the gas will also be recorded from the thermometer mounted on the well head. In addition, barometric pressure readings will be recorded on each day during the start-up operations.

Upon completion of the pressure readings, the pressure gauges will be disconnected from the well head assembly and a combustible gas indicator and an oxygen meter connected in series will be connected to the upper sample monitoring port of the PVC portion of the well head/trench head assembly. The gas will be monitored for five (5) minutes and then the explosive gas (methane) and oxygen concentrations will be recorded. This procedure will then be performed on the remaining well head assemblies.

On Day Two (2) of the system start-up, the control valves, CV-1, CV-2 and CV-3 (see Project Drawing 82685XI-23) will be fully opened. The control valve on the well head assembly GEW-1 will be fully opened. Once the valve is fully opened, two (2) pressure monitoring gauges (as described in the previous paragraph) will be connected to the two sample monitoring ports on the PVC portion of the well head assembly. The pressure reading of each gauge will be recorded after 5 minutes. The reading from the sampling port installed in the 4 inch PVC portion of the well head assembly will be labeled as P-1. The reading from the sample port on the 8 inch portion of the PVC riser will be labeled P-2. Upon completion of the pressure readings, the pressure gauge will be disconnected from the well head assembly, the control valve left open and the procedure repeated on the remainder of the well head assemblies.

The flare will be lit without the blower operating, as soon as the methane concentration at the flare will support a flame, approximately 25% methane. The well head valve(s) will be left in the open position while the "free flow" measurement is taken at the flare. This free flow measuring procedure at the flare is described in Section 6.2.2. The system with the flare lit will remain in "free flow" status for four (4) hours. Upon completion of the free flow testing, all well head control valves will be closed and the flare will be extinguished. Control valves CV-1, CV-2 and CV-3 will remain open.

On Day Three (3) of the initial system tuning, the static fluid level measurements will be taken at each of the gas extraction well heads (GEW-1 through GEW-23). The water level measurements will be taken by utilizing an electric (battery operated) water level indicator. The water level indicator will be inserted through the 1-1/2 inch access/sampling port located on top of the PVC portion of the well head trench assembly. These levels will be designated as the pre-extraction fluid levels.

Once the static water levels have been determined, the blower will be started. The system tuning will start with the well head assembly on gas extraction well GEW-1. A pressure monitoring gauge will be attached to the sample port located immediately below the control valve on the polyethylene portion of the well head assembly. The pressure reading will be recorded as P-3, available vacuum. After obtaining the reading, the pressure gauge will be disconnected from the sample port and connected to the two (2) sample monitoring ports located on the PVC portion of the well head assembly. The control valve will then be opened on the well head assembly until a reading of 2 inches of water column is obtained and stabilized on the gauge connected to the upper sample monitoring port on the 4-inch PVC portion of the well head assembly. When the pressure gauge connected to the upper port indicates 2 inches of water column, the readings from both pressure gauges, the temperature reading from the thermometer mounted on the well head assembly, and the time of the reading will be recorded. The pressure reading from the upper port will be recorded as P-4 and the reading from the lower port recorded as P-5.

Upon completion of the pressure readings, the pressure gauges will be disconnected from the well head assembly and a combustible gas indicator and an oxygen meter connected in series will be connected to the upper sample monitoring port of the PVC portion of

the well head/trench head assembly. The gas will be monitored for five (5) minutes and then the explosive gas (methane) and oxygen concentrations will be recorded. This procedure will then be performed on the remaining well head assemblies.

The flare will be lit using the procedure described in Section 6.2.2. If the flare is unable to be lit, the remainder of the well head/trench head assemblies will be brought on-line in increments of three (3). After each additional increment is brought on-line, an attempt will made to light the flare. This procedure will continue until all well head/trench head assemblies are brought on line. When all wells have been brought on line, a round of wellhead pressure readings and valve adjustments will be made to verify 2 inches of water column vacuum is applied to the well casing. If the flare cannot be lit with all wells brought on-line, the Contractor shall notify that the flare is operating properly and will not light due to low fuel. The Contractor will notify in accordance with procedures described in Section 3.4, Incident Report, of this Plan. If the Settling Defendants' Representative determines that the flare will not operate without the use of supplemental fuel, a determination will be made regarding re-evaluating the system and importing supplemental fuel. In addition, a Corrective Action Form (see Figure 5) will be completed and submitted with the Progress Report for that reporting period.

The system will be operated for 6 to 12 hours at the 2 inches of water column operating pressure. The applied well head vacuum will be doubled to 4 inches of water column and the wells will be monitored to detect oxygen concentrations above background (air intrusion) for 12 hours. If air intrusion is detected, the well in which air intrusion is detected will be tuned back to the prior applied vacuum, where oxygen detection was at background levels, and monitored. All wells not experiencing air intrusion, (oxygen readings above pre-extraction levels), will be again incrementally tuned to double the applied vacuum to 8 inches of water column and monitored for oxygen levels above background. This process will be repeated until all wells have experienced an increase in oxygen level readings above background. In addition, this procedure will be repeated until all the wells have stabilized with maximum flow and no oxygen level readings above background levels. Once this condition is achieved, tuning of the wells will be performed daily.

The daily tuning will be performed to maximize flow and minimize methane concentrations while maintaining background (minimum) oxygen levels. Once a steady state is noticed over a 24 hour period. the tuning frequency will go to two (2) days between tuning events. After three (3) successful two (2) day periods of maintaining maximum flows and background levels of oxygen. the tuning procedure schedule will be advanced to once per week. When conditions stabilize on the weekly basis. the system will be in the normal operation mode. It is anticipated that the system stabilization may take up to three (3) weeks to occur.

6.2.1.2 Operational Tuning - The gas extraction system will be tuned in accordance with the schedule discussed in Section 6.2.1. In no case will the tuning frequency exceed a one month interval between tuning events. However. the schedule may be altered to address unforeseen site constraints such as methane levels at the flare dropping below the upper explosive limit (UEL). If the system has been shut down for more than one (1) week. operational tuning will be performed immediately after restarting the system.

Operational tuning will involve measuring the system flows and static water levels. and monitoring the gas concentrations. The system flows will be measured utilizing pressure gauges and the gas concentrations will be monitored utilizing a combustible gas and oxygen meter. While measuring. the control valve on the well will be opened or closed as required to maintain the maximum possible flow without increasing the oxygen levels above the background levels determined in Section 6.2.1.1. The static water level will also be measured utilizing the procedure described in Section 6.2.1.1.

If the system performance criteria cannot be satisfied in any of the individual well head/trench head assemblies. even after the valve for that assembly is fully opened. it will be reported in the subsequent progress report. If the Settling Defendants' Representative determines that repair work is necessary. the Contractor(s) will be responsible for scheduling corrective action maintenance within one month of the notification from the Settling Defendants' Representative of the problem. In addition. a Corrective Action Form (see Figure 5) will be completed and submitted with the Progress Report for that reporting period.

6.2.2 Flare Operation

Operation of the flare will be inspected when the system is started, quarterly for the first year, semi-annually for the second and third year, and annually thereafter for the duration of the Post Closure Period or until the system is shut down with the USEPA WDNR approvals (see Table 11). The initial flare designed for the site is a candle stick flare with auto relight capabilities. The flare will be lit upon the initial start-up of the system and after the flare is extinguished, by following the flare manufacturer's start-up procedure.

Flow measurements at the flare station will be taken by connecting a pressure monitoring gauge to each of the sample monitoring ports at the flow measuring orifice location. The time and pressure readings will be recorded from both gauges. The reading from the gauge nearest the blower will be recorded as PB1 and the other reading as PF2. Gas concentrations and temperature will also be measured and recorded. A Flare Station Flow Measurement Form (see Figure 12) will be completed and submitted with the Progress Report for that reporting period.

If the methane concentration drops below 30% by volume, or oxygen concentration is above 5% by volume, at the flare, it will be reported in the subsequent progress report.

If excessive back pressure is detected at the inlet to the flare flame arrestor (above 6 inches of water column), the gas extraction system will be shut down for cleaning of the flame arrestor grid canisters.

6.2.3 Perimeter Gas Probes

The ten (10) perimeter gas probes (see Figure 6) will be tested quarterly for the first two (2) years, semi-annually for the following three (3) years, and annually thereafter for the duration of the Post Closure Period (see Table 12). The testing of the perimeter probe's emitted gas will involve measuring the explosive gas (methane) and oxygen concentrations at the outlet. In addition, sampling personnel will visually inspect the perimeter gas probes during each sampling event. The Landfill Gas Monitoring Probe

Sampling Form (Figure 10C) will be completed for each sampling event. For detailed discussions on the testing methodology, frequency and reporting, see the QAPP.

The action level for the gas probes will be 25 percent of the lower explosive limit (LEL). If this level is exceeded, the vacuum on the gas extraction system will be incrementally increased with monthly monitoring until the LEL is measured below this action level for all gas probes.

6.2.4 Extracted Gas

The extracted gas from the gas extraction system will be sampled and tested quarterly the first year for Table 3A indicator parameters (benzene and vinyl chloride) and Table 3B compounds of NR445, Wisconsin Administrative Code. If an action level is exceeded for any compound in any quarter, the candlestick flare will be replaced with a Lowest Achieveable Emission Rate (LAER) type flare within nine (9) to twelve (12) months after receipt of the results. Note, if a NR445 exceedance occurs, a Best Available Control Technology (BACT) type flare will not be used because it is more cost-effective to install the highest performance type flare (LAER) which is a higher heating flare than a BACT flare.

Within two (2) months of installation of a LAER flare, if required based on the testing of the candlestick flare, the flare inlet will be tested for benzene, vinyl chloride, non-methane organic carbon (NMOC), carbon monoxide, carbon dioxide, and methane. In addition, the outlet will be tested for the destruction efficiency for NMOC, vinyl chloride and benzene. The inlet testing will be performed every two (2) years thereafter and the outlet tested every four (4) years thereafter. This testing program will then proceed for the duration of the Post Closure Period or until the USEPA and WDNR approve an adjustment in the testing and/or frequency (see Table 11). See the QAPP for detailed discussions on the sampling and testing methodology, sampling frequency, and reporting requirements.

6.3 ENCLOSED FLARE

At this time, we do not anticipate the use of an enclosed flare. If an enclosed flare is installed at any time after initial start-up, this document will be amended to discuss the operation and maintenance of the flare.

6.4 OPERATION AND MAINTENANCE COST ESTIMATE

A cost estimate for the operation and maintenance of the gas extraction system and the extraction gas monitoring system have been calculated separately for the Post Closure Period. The activities for operation and maintenance of the active gas system included in the cost estimate are as follows:

- Well head inspection and maintenance.
- Blower system inspection.
- Flare system inspection.
- Gas system extraction performance tuning.
- Extraction well and monitoring probe sampling.
- Reporting.
- Utility usage.

The activities for the extracted gas monitoring included in the cost estimate are as follows:

- Flare sampling and testing.
- Perimeter probe testing.
- 5-Year Performance Reviews.

The following assumptions were made in preparing this cost estimate:

- Cost estimate based on 1992 costs.
- Post Closure Period begins at the end of 1993 for landfill O&M activities and the end of 1994 for sludge lagoon O&M activities..
- Post Closure Period extends for the full 30 years (i.e., the system is not shut down before 30 years expires).

- No significant monitoring well rehabilitation or replacement is necessary.
- The discount rate is equal to 5%.
- A contingency of 20% is included to account for unexpected events (e.g., a major system failure, etc.).

The present value cost for each of the active systems activities is presented on Table 13 and the gas monitoring is presented on Table 5. The total present value cost for the operation and maintenance of the gas extraction systems is approximately $131,200 and $125,200 (including 20% contingency) for the gas monitoring activities. These cost estimates do not include costs incurred due to system failures.

A summary of the total project operation and maintenance costs is included in Table 14. These costs also do not include costs incurred due to system failures.

TABLES

LIST OF TABLES

TABLE 1

FINAL COVER SYSTEM ROUTINE MAINTENANCE SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Item	Interval (Years) of Post Closure Period	Frequency
Mowing	0 - 1	4 times per growing season
	2 - 3	Annually
	4 - 30	Once every 5 years

TABLE 2

FINAL COVER SYSTEM OPERATION AND MAINTENANCE INSPECTION SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Item	Interval (Years) of Post Closure Period	Frequency
Security	0 - 30	Annually
Access	0 - 30	Annually
Vegetation Cover(1)(2)	0 - 30	Annually
Drainage and Erosion	0 - 30	Annually
Lagoon Settlement(2)	0 - 30	Annally
Landfill Settlement	0 - 30	Annually
Survey Benchmarks	0 - 30	Annually
Monitoring Wells and Probes	0 - 30	Annually

(1) Frequency may be increased during first two years if the grass cover does not become adequately established due to unfavorable weather conditions (i.e.. drought conditions or very wet growing seasons).

(2) The Post Closure Period for the landfills O&M activities will begin after the landfill covers are completed and the Post Closure Period for the sludge lagoon O&M activities will begin after the sludge lagoon cover is completed.

TABLE 3

GROUNDWATER AND SURFACE WATER SAMPLING SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Interval (Years) of Post Closure Period	Frequency
0 - 2	Quarterly
3 - 5	Semi-annually
6 - 30	Annually*

* This frequency assumes that a petition to the USEPA and WDNR are approved.

TABLE 4

ESTIMATED OPERATION AND MAINTENANCE COST
FINAL COVER SYSTEM MAINTENANCE AND INSPECTIONS
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Activity	Time Period (years)	Unit Cost ($)	Frequency	Total Number	Discount Rate	Present Value Cost Per Activity
Revegetation (landfills & sludge lagoon)	0 - 5	$28,900	Annually	5	5%	$125,000
Mowing	0 - 1	$600	4 times per season	4	5%	$2,300
	2 - 3	$600	Annually	2	5%	$1,100
	4 - 30	$600	Every 5 years	6	5%	$1,800
Rodent Control Inspection and Removal	0 - 30	$500	Annually	30	5%	$7,700
Landfill Cover Inspection	0 - 30	$500	Annually	30	5%	$7,700
Sludge Lagoon Cover Inspection	1-31	$500	Annually	30	5%	$7,300
Sludge Lagoon Settlement Topograph Hub Survey	1-31	$1,500	Annually	30	5%	$22,000
20% Contingency						$35,000
			TOTAL PRESENT VALUE COST =			$210,000

TABLE 5
ESTIMATED OPERATION AND MAINTENANCE COSTS
SAMPLING AND MONITORING
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Activity	Time Period	Unit Cost ($)	Frequency	Total Number	Discount Rate	Present Value Cost Per Activity
Groundwater						
Monitoring Wells	0 - 2 years	$26,700	Quarterly	8	5%	$198,600
	3 - 5 years	26,700	Semi-Annually	6	5%	131,900
	6 - 30 years	26,700	Annually	25	5%	294,800
Background Wells	0 - 6 months	7,100	Quarterly	2	5%	13,300
Performance Review	0 - 30 years	8,350	5 years	6	5%	23,200
						$661,800
Surface Water						
Sampling Point and Background Point	0 - 1 year	$6,600	Quarterly	4	5%	$23,400
	2 - 5 years	6,600	Semi-Annually	8	5%	44,600
	6 - 30 years	6,600	Annually	25	5%	72,900
Performance Review	0 - 30 years	4,200	5 years	6	5%	11,700
						$152,600
Leachate						
Sludge Lagoon Manhole, New UST A and Composite Sample from New UST B and WDNR UST	1 - 5 years	6,500	Annually	5	5%	28,100
	6 - 30 years	6,500	Biennually	12	5%	34,300
Performance Review	0 - 30 years	$4,200	5 years	6	5%	11,700
						$74,100
Gas						
Gas Probes	0 - 1 year	$1,300	Quarterly	4	5%	$5,000
	2 - 5 years	1,300	Semi-annually	8	5%	6,400
	6 - 30 years	1,300	Annually	25	5%	14,400
Gas Flare*	0 - 1 year	$20,000	Quarterly	4	5%	76,200
Performance Review	0 - 30 years	$8,350	5 years	6	5%	$23,200
						$125,200
20% Contingency						$202,800
			TOTAL PRESENT VALUE COST =			$1,216,500
Enclosed Flare	0 - 2 months	$15,000	Once	1	5%	$14,300
	3 - 30 years	4,600	2 years	14	5%	31,800
	5 - 30 years	15,000	4 years	7	5%	51,900
20% Contingency						19,000
			TOTAL =			$117,600

*If an exceedance condition occurs within the first year of operation, an enclosed flare and associated components must be installed and monitored. See following for O&M costs of enclosed flare.

TABLE 6

LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM
ROUTINE MAINTENANCE SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Item	Interval (Years) of Post Closure Period	Frequency
Clean System	0 - 30	Every 3 years
Leachate Removal	0 - 30	Every 2 weeks

TABLE 7

LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM
NORMAL OPERATION AND MAINTENANCE INSPECTION SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Item	Interval (Years) of Post Closure Period	Frequency
Pumps	0 - 30	Semi-annually
Gravity Collection and Forcemain Piping	0 - 30	Semi-annually
Leachate Collection Tank	0 - 30	Semi-annually

TABLE 8

LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM
ROUTINE MONITORING AND TESTING SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Item	Interval (Years) of Post Closure Period	Frequency
Pump Verification	0 - 30	Annually
Leachate Sampling	0 - 5	Annually
	6 - 30	Biennually*

*This frequency assumes that petitions to USEPA and WDNR are approved.

TABLE 9

ESTIMATED OPERATION AND MAINTENANCE COST
LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM
ROUTINE MAINTENANCE SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Activity	Time Period (Years)	Unit Cost ($)	Frequency	Total Number	Discount Rate	Present Value Cost Per Activity
Pump Electric Costs	0 - 30	$1,000	Annually	30	5%	$15,400
Pump Replacement (5 pumps @ $2,500/each)	0 - 30	$12,500	10 years	2	5%	$12,400
Pump Maintenance	0 - 30	$250	Annually	30	5%	$3,800
Inspection	0 - 30	$500	Semi-annually	60	5%	$15,400
Cleanout	0 - 30	$1,600	Every 3 years	10	5%	$7,800
Leachate Removal	0 - 30	$10,400	Annually	30	5%	$159,900
20% Contingency						$43,000
			TOTAL PRESENT VALUE COST =			$257,700

TABLE 10

GAS EXTRACTION SYSTEM ROUTINE OPERATION AND MAINTENANCE SCHEDULE MID-STATE SITE MARATHON COUNTY, WISCONSIN

Item	Interval (Years) of Post Closure Period	Frequency
Gas Extraction System	0 - 1	Quarterly
	2 - 3	Semi-annually
	4 - 30	Annually*

*If the EPA and WDNR grant permission for early system shut down, the system operation will be terminated. The frequency may also be reduced upon USEPA and WDNR approval.

TABLE 11

GAS EXTRACTION SYSTEM ROUTINE MONITORING SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Item	Interval of Post Closure Period	Frequency
Well Tuning**	0 - 2 months	Weekly
	3 - 6 months	Bi-monthly*
	7 - 72 months	Semi-annually
Flare Operation**	0 - 1 year	Quarterly
	2 - 3 years	Semi-annualy
	4 - 30 years	Annually
Candlestick Flare****	0 - 1 year	Quarterly***
LAER Flare (if required)**		
Inlet Testing	0 - 30 years	Biennially
Outlet Testing	0 - 30 years	Quadrennially

* If the gas monitoring action levels are exceeded, the gas monitoring frequency will revert to monthly until the levels decline or if no decline is evident for three months, remedial action will be taken.

** If the EPA and WDNR grant permission for early system shutdown, the system operation will be terminated and monitoring will no longer be required.

*** If an action level is not exceeded during each of the quarterly tests, testing will be halted.

**** If at any time during the quarterly testing an action level is exceeded, a LAER flare will be installed within nine (9) to twelve (12) months after receipt of the results, and inlet and outlet testing will be performed.

TABLE 12

LANDFILL GAS MONITORING PROGRAM
GAS MONITORING PROBE ROUTINE INSPECTION SCHEDULE
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Medium	Measurement Locations	Interval (Years) of Post Closure Period	Frequency of Measurements
Landfill Gas	Permanent gas probes around the landfill	0 - 2	Quarterly
		3 - 5	Semi-annually
		6 - 30	Annually

TABLE 13

ESTIMATED OPERATION AND MAINTENANCE COST
ACTIVE GAS EXTRACTION SYSTEM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Activity	Time Period	Unit Cost ($)	Frequency	Total Number	Discount Rate	Present Value Cost Per Activity
Utility Costs	0 - 30 years	$1,000	Annually	30	5%	$15,400
Well/Well Head Inspection	0 - 1 year	$180	Quarterly	4	5%	$700
	2 - 3 years	$180	Semi-annually	4	5%	$650
	4 - 30 years	$180	Annually	26	5%	$2,150
Blower/Flare Inspection	0 - 1 year	$100	Quarterly	4	5%	$400
	2 - 3 years	$100	Semi-annually	4	5%	$400
	4 - 30 years	$100	Annually	26	5%	$1,300
Sludge Lagoon Drip Leg H20 Level Maintenance	0 - 30 years	$50	Bi-monthly	720	5%	$18,500
Gas Collection Header Inspection	0 - 1 year	$50	Quarterly	4	5%	$200
	2 - 3 years	$50	Semi-annually	4	5%	$200
	4 - 30 years	$50	Annually	26	5%	$600
Landfill Gas System Start-up	0 month	$1,500	System Start-up	1	5%	$1,400
System Tuning	0 - 2 months	$1,250	Weekly	8	5%	$9,500
	3 - 6 months	$1,250	Bi-monthly	8	5%	$7,200
	7 - 72 months	$1,000	Semi-annually	11	5%	$7,700
Gas Collection Header Repair	0 - 30 years	$300	Annually	30	5%	$4,600
Well Head Repair	0 - 30 years	$1,200	Biennially	15	5%	$9,000
Blower Repair	0 - 30 years	$5,000	15 years	1	5%	$2,400
Flare Repair	0 - 30 years	$24,000	15 years	1	5%	$11,600
Monitoring Probe Inspection	0 - 30 years	$1,000	Annually	30	5%	$15,400
20% Contingency						$21,900
			TOTAL PRESENT VALUE COST =			$131,200

TABLE 14

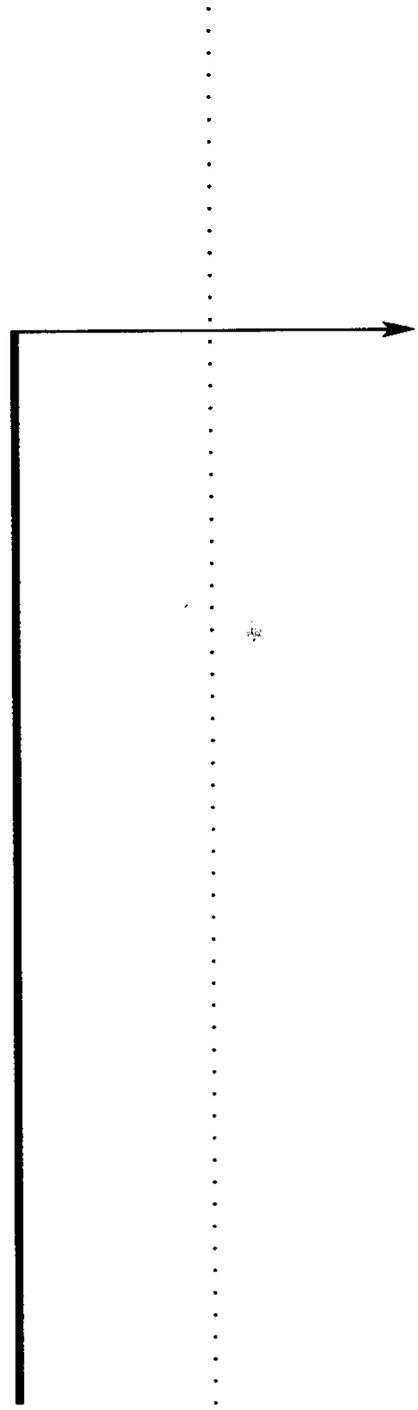
TOTAL OPERATIONS AND MAINTENANCE COST
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Interval (years) of Post Closure Period	Total Cost
0-1	$294.100
2-5	501.300
6-31	718.100
Subtotal	$1.513.500
Contingency (20%)	302.800
TOTAL	$1.816.300

Enclosed Flare Contingency

Interval (years) of Post Closure Period	Total Cost
0-1	$14.300
2-5	19.900
6-31	63.800
Subtotal	$98.000
Contingency (20%)	19.600sf
TOTAL	$117.600

FIGURES



LIST OF FIGURES

FIGURE 1

INCIDENT NOTIFICATION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Inspector identifying emergency:_____

Date of identification of emergency: _____

Description of emergency:_____

_____

_____

_____

_____

Person(s) notified:_____

Date of notification:_____

Signature of inspector and date:_____

List of persons to be notified:

1. Settling Parties' representative:_____

   Address:_____

   Telephone number:_____

2. Settling Parties' alternative representative:_____

   Address:_____

   Telephone number:_____

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FIGURE 2

ROUTINE MAINTENANCE FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Date: _____

Performed By: _____

List Maintenance Activities Performed:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Comments*: _____

_____

_____

_____

_____

*Please note any additional maintenance that is required.

FIGURE 3A

FINAL COVER SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
A. SECURITY			
1. Perimeter Fencing	____	____	_____
2. Posted Signs	____	____	_____
3. Gates/Locks	____	____	_____
B. ACCESS			
1. Access Road	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 3B

FINAL COVER SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE			REQUIRES ATTENTION			COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
	Old Mound Landfill	Interim Landfill	Sludge Lagoon	Old Mound Landfill	Interim Landfill	Sludge Lagoon	
C. VEGETATION							
1. Top Slope Quality	____	____	____	____	____	____	_____
2. South Slope Quality	____	____	____	____	____	____	_____
3. West Slope Quality	____	____	____	____	____	____	_____
4. North Slope Quality	____	____	____	____	____	____	_____
5. East Slope Quality	____	____	____	____	____	____	_____
6. Weed Control	____	____	____	____	____	____	_____
7. Rodent Control	____	____	____	____	____	____	_____
8. Evidence of Gas Stress	____	____	____	____	____	____	_____
9. Evidence of Leachate Damage	____	____	____	____	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 3C
FINAL COVER SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____ TYPE OF INSPECTION (Periodic or Other) _____

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
D. DRAINAGE AND EROSION CONTROL			
1. Central Swale	____	____	_____
2. South Swale	____	____	_____
3. East Culvert and Rip-Rap Apron	____	____	_____
4. West Culvert and Rip-Rap Apron	____	____	_____
5. Old Mound Landfill			
a. Top Slope	____	____	_____
b. South Side Slope	____	____	_____
c. West Side Slope	____	____	_____
d. North Side Slope	____	____	_____
e. East Side Slope	____	____	_____
6. Interim Landfill			
a. Top Slope	____	____	_____
b. South Side Slope	____	____	_____
c. West Side Slope	____	____	_____
d. North Side Slope	____	____	_____
e. East Side Slope	____	____	_____
7. Sludge Lagoon			
a. Top Slope	____	____	_____
b. South Side Slope	____	____	_____
c. West Side Slope	____	____	_____
d. North Side Slope	____	____	_____
e. East Side Slope	____	____	_____

Please Clearly Identify Areas Needing Attention By Item No.) on the Attached Figures

FIGURE 3D

FINAL COVER SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
E. SETTLEMENT CONTROL			
1. Old Mound Landfill			
a. Top Slope Drainage	____	____	_____
b. Cover Integrity	____	____	_____
2. Interim Landfill			
a. Top Slope Drainage	____	____	_____
b. Cover Integrity	____	____	_____
3. Sludge Lagoon			
a. Top Slope Drainage	____	____	_____
b. Cover Integrity	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 3E

FINAL COVER SYSTEM INSPECTION

SITE PLAN

MID-STATE SITE

MARATHON COUNTY, WISCONSIN

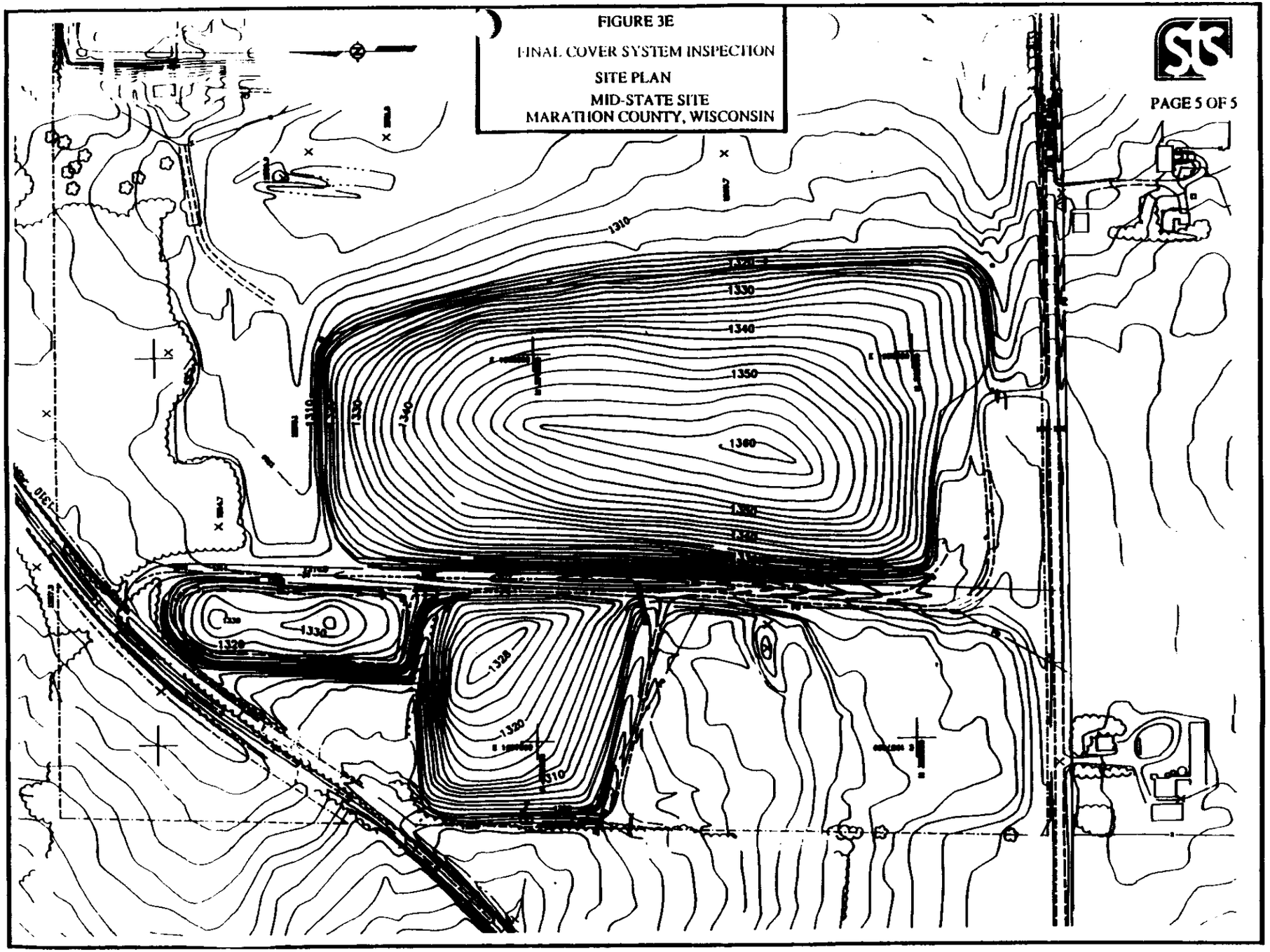

FIGURE 4A

MONITORING WELL INTEGRITY FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Well No: _____ Date: _____ Time: _____

Performed by: _____ Affiliation: _____

	Yes	No	Action Required
A. Location/identification			
1. Is well readily accessible?	___	___	_____
2. Is well in a protected area or if in a vulnerable traffic area, is well surrounded by protective posts?	___	___	_____
3. Is well situated outside a low point or ponded water?	___	___	_____
4. Is wellhead area free of waste, stored chemicals, etc.?	___	___	_____
5. Is well flagged or painted?	___	___	_____
6. Is well labelled inside and outside?	___	___	_____
B. Surface Seal			
1. Is surface seal in good condition (i.e., no cracks)?	___	___	_____
2. Is the seal secure against the casing and ground surface?	___	___	_____
3. Is the seal sloped away from the wellhead?	___	___	_____
C. External Casing			
1. Does well have external casing in good condition (i.e., no cracks)?	___	___	_____
2. Is external casing locked?	___	___	_____
3. Is lock in good condition (i.e., no severe rust)?	___	___	_____
4. Is casing/annulus in good condition and free of water/animals/debris?	___	___	_____
D. Internal Casing			
1. Is internal casing at least 1 foot above ground?	___	___	_____
2. Is casing tight horizontally/vertically/ rotationally?	___	___	_____
3. Is casing free of animals/debris/kinks or bends?	___	___	_____

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FIGURE 4B

MONITORING WELL INTEGRITY FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

	Yes	No	Action Required
4. Is the cap snugly fitting/in good condition/made of suitable material?	____	____	

E. ***Additional Comments/Actions Required***

_____

_____

_____

_____

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FIGURE 5A

CORRECTIVE ACTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DESCRIPTION OF PROBLEM: _____

_____

_____

_____

_____

_____

DATE PROBLEM IDENTIFIED: _____

CORRECTIVE ACTION TAKEN TO RESOLVE PROBLEM: _____

_____

_____

_____

_____

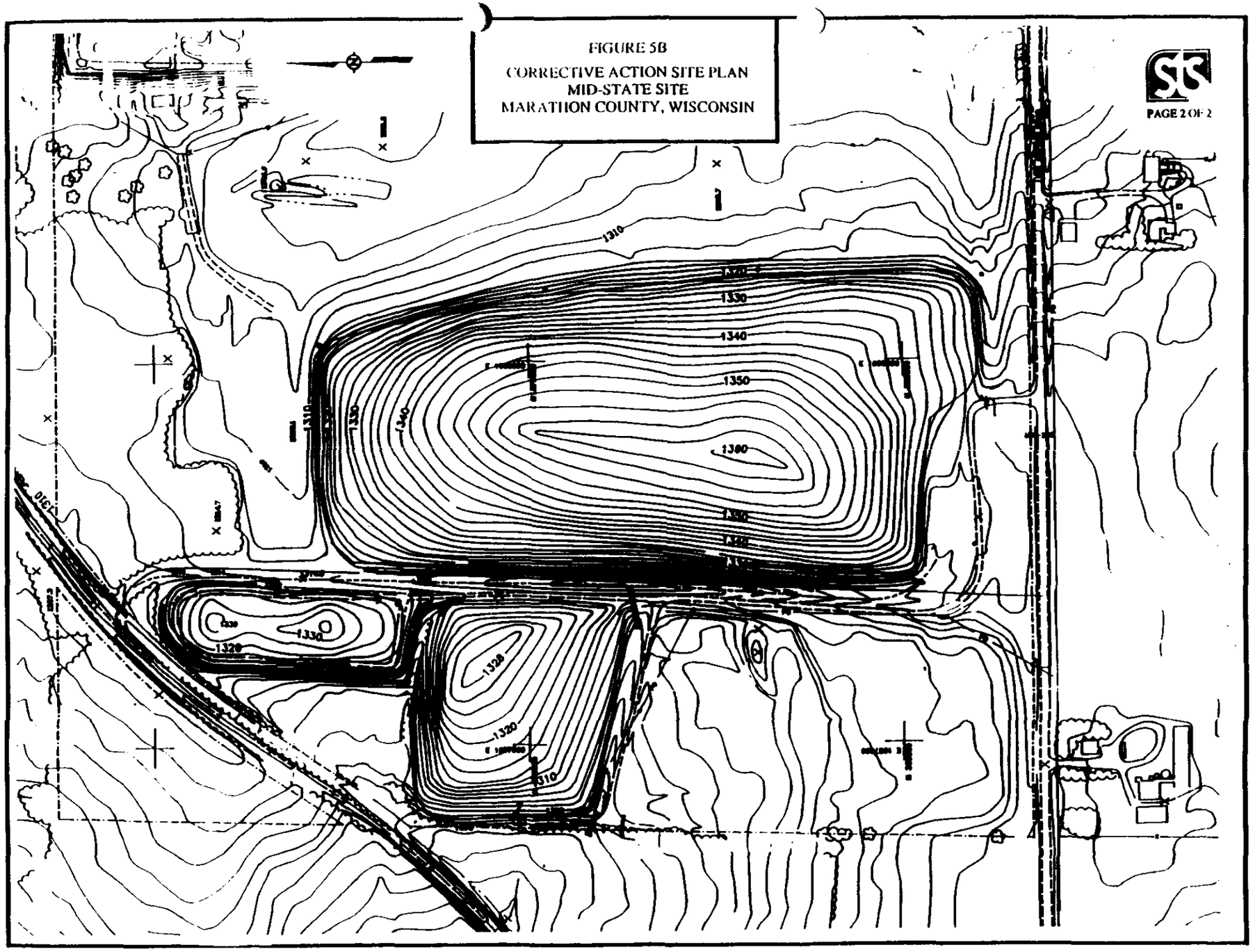
_____

DATE RESOLVED: _____

INSPECTOR: _____

FIGURE 5B

CORRECTIVE ACTION SITE PLAN
MID-STATE SITE
MARATHON COUNTY, WISCONSIN



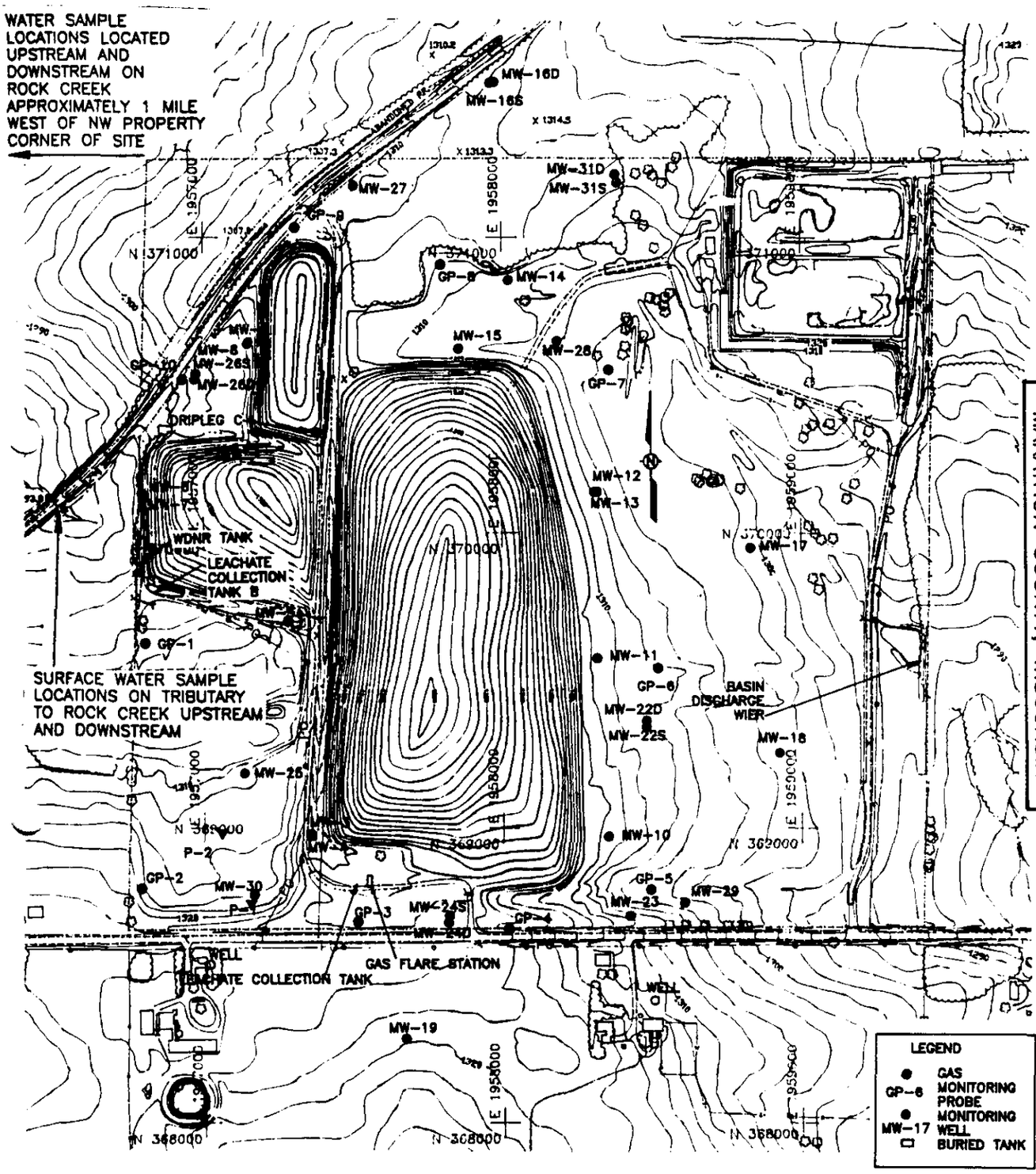


FIGURE 6
LONG TERM MONITORING STATIONS
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

FIGURE 7A

LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
A. SECURITY			
1. Perimeter Fencing	____	____	_____
2. Posted Signs	____	____	_____
3. Gates and Locks	____	____	_____
B. ACCESS			
1. Access Road	____	____	_____
2. Gates	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 7B

LEACHATE SEEP AND GAS CONDENSATE COLLECTION SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
B. PIPELINE			
1. Evidence of Damage	____	____	_____
2. Clearly Marked	____	____	_____
3. Manholes and Pump Stations			
a. physical condition	____	____	_____
b. evidence of leakage	____	____	_____
c. evidence of odors	____	____	_____
d. evidence of obstructions	____	____	_____
C. LEACHATE COLLECTION TANKS AND LEACHATE LOADOUT FACILITIES			
1. Alarms	____	____	_____
2. Loadout Facility Asphalt Pad	____	____	_____
3. Loadout Facility Drain	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 8

LEACHATE SEEP AND GAS CONDESATE COLLECTION SYSTEM
ALARM RESPONSE FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

	Date	Time	Name (print)	Signature
Alarm (time of pump shutdown identification)	_____	_____	_____	_____
Arrival at Site for Inspection	_____	_____	_____	_____
Pump Restarted	_____	_____	_____	_____

Diagnosis of Problem

_____

_____

_____

_____

_____

_____

Corrective Action Taken (include details of repairs or adjustments)

_____

_____

_____

_____

_____

_____

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FIGURE 9A

GAS EXTRACTION SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
A. GAS EXTRACTION WELL HEADS			
1. Well Casing	____	____	_____
2. PVC Components	____	____	_____
3. Flexible Hose	____	____	_____
4. Control Valve	____	____	_____
5. PE Components	____	____	_____
6. Sample Ports	____	____	_____
B. BLOWER			
1. Blower Operation	____	____	_____
2. Control Panel	____	____	_____
3. Actuator Valve	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 9B

GAS EXTRACTION SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
C. FLARE			
1. Flare Operation	____	____	_____
2. Evidence of Damage	____	____	_____
3. Flame Arrestor	____	____	_____
4. Control Panel	____	____	_____
5. Guy Wires	____	____	_____
6. Windshield	____	____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 9C

GAS EXTRACTION SYSTEM INSPECTION FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

DATE _____

TYPE OF INSPECTION _____
(Periodic or Other)

INSPECTOR _____

ITEM	ADEQUATE	REQUIRES ATTENTION	COMMENTS (NOTE IF IMMEDIATE ATTENTION REQUIRED)
D. SLUDGE LAGOON			
1. Evidence of Damage	_____	_____	_____
E. GAS COLLECTION HEADER			
1. Signs in Place	_____	_____	_____
2. Differential Settlement	_____	_____	_____
3. Physical Condition of Exposed Portion	_____	_____	_____

Please Clearly Identify Areas Needing Attention (Reference Item No.) on the Attached Figures

FIGURE 10A

GAS MONITORING PROBE FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

I. GAS EXTRACTION WELL

Well No: _____ Date: _____ Time: _____

Performed by: _____ Affiliation: _____

A. Location/identification	Yes	No	Action Required
1. Is well readily accessible?	___	___	_____
2. Is well situated outside a low point or ponded water?	___	___	_____
3. Is well area free of waste, stored chemicals, etc.?	___	___	_____
4. Is well flagged or painted?	___	___	_____
5. Is well labelled outside?	___	___	_____
B. Surface Seal			
1. Is final cover in good condition (i.e., no cracks)?	___	___	_____
2. Is the final cover secure against the casing?	___	___	
3. Is the final cover sloped away from the well head?	___	___	
C. External Casing			
1. Is the well casing in good condition (i.e., no cracks)?	___	___	_____
D. Well Head			
1. Is well head casing at least 3 feet above ground?	___	___	_____
2. Is Well head sound (i.e., no cracks)?	___	___	_____
3. Is well head flex hose free of kinks or bends	___	___	_____
4. Is the cap and valve snugly fitting/ in good conditions?	___	___	_____

E. Additional Comments/Actions Required

_____

_____

_____

_____

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FIGURE 10B

GAS MONITORING PROBE FORM
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

II. GAS PROBE

Probe No: _____ Date: _____ Time: _____

Performed by: _____ Affiliation: _____

A. Location/identification	Yes	No	Action Required
1. Is probe readily accessible?	___	___	_____
2. Is probe situated inside a low point or ponded water?	___	___	_____
3. Is probehead area free of waste, stored chemicals, etc.?	___	___	_____
4. Is probe flagged or painted?	___	___	_____
5. Is probe labelled inside and outside?	___	___	_____
B. Surface Seal			
1. Is surface seal in good condition (i.e., no cracks)?	___	___	_____
2. Is the seal secure against the casing?	___	___	_____
3. Is the seal sloped away from the probehead?	___	___	
C. External Casing			
1. Does probe have external casing in good condition (i.e., no cracks)?	___	___	_____
2. Is external casing locked?	___	___	_____
3. Is lock in good condition (i.e., no severe rust)?	___	___	_____
4. Is casing/annulus in good condition and free of water/animals/debris?	___	___	_____
D. Internal Casing			
1. Is internal casing at least 1 foot above ground?	___	___	_____
2. Is casing tight horizontally/ vertically/rotationally?	___	___	
3. Is the cap snugly fitting/in good good condition?	___	___	_____

E. Additional Comments/Actions Required

_____

_____

_____

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FIGURE 10C
MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Landfill Gas Monitoring Probe Sampling Form
Monitoring Probe ID _____

Date _____

Time _____ Weather _____

Barometric Pressure _____ Rising/Falling (circle one) Operator _____

Time	Pressure Reading (inches WC)	Methane Concentration (%)	Oxygen Concentration (%)	Static Water Level (ft.)

FIGURE 11A

Gas Extraction Start-Up Data Form
(Passive Operation Only)

MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Well Head/Trench Head ID _____

Date _____

Time _____ Weather _____

Barometric Pressure _____ Rising/Falling (circle one) Operator _____

Time	Pre-Extraction Level (Po) (inches WC)	P1 (inches WC)	P2 (inches WC)	Methane Concentration (%)	Oxygen Concentration (%)	Pre-Extraction Fluid Depth (ft.)	Gas Temperature (^{O}C)

FIGURE 11B

Landfill Gas Start-Up Data Form
(Active Operation Only)

MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Well Head/Trench head ID _____

Date _____

Time _____ Weather _____

Barometric Pressure _____ Rising/Falling (circle one) Operator _____

Time (Military)	Available Vacuum P3 (inches WC)	Upper Port Pressure P4 (inches WC)	Lower Port Pressure P5 (inches WC)	Methane Concentration (%)	Oxygen Concentration (%)	Fluid Depth (ft.)	Gas Temperature (^{O}C)

FIGURE 12

Flare Station Flow Meaurement Form

MID-STATE SITE
MARATHON COUNTY, WISCONSIN

Date _____

Time _____ Weather _____

Barometric
Pressure _____ Rising/Falling (circle one) Operator _____

Time	PB1 (inches WC)	PF2 (inches WC)	Methane Concentration (%)	Oxygen Concentration (%)	Gas Temperature (^{O}C)