EXHIBIT A 2

TO

AGREEMENT FOR ENVIRONMENTAL MONITORING, LABORATORY ANALYSIS AND REPORTING SERVICES AT THE HARTFORD LANDFILL

SCOPE OF SERVICES

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Environmental Monitoring, Laboratory Analysis and Reporting - Hartford Landfill

BACKGROUND

The Hartford Landfill, located off Leibert Road in the North Meadows area of Hartford, Connecticut, is an inactive solid waste disposal facility that is currently undergoing final closure. The site is bounded by the North Meadow Flood Control Dike to the north and east, the City of Hartford Police Department and Public Works facility to the south, and Interstate 91 to the west. A site location map has been included as **Figure 1**.

The Hartford Landfill operated from the 1940's through 2008. The facility consists of two distinct, adjacent northern and southern disposal areas. The southern area is consists of approximately 86 acres of disposal area, which was most-recently used for landfilling non-processibles and bulky waste only. Ash residue has been disposed in a 22+/- acre "interim" cell located in the northeast corner of this disposal area. The interim ash cell reached its permitted capacity in February 1998. The permit to construct the "lined area" for ash residue disposal to the north of the southern area was received by the Connecticut Resources Recovery Authority (CRRA) from the Connecticut Department of Environmental Protection (CTDEP) on November 8, 1996. The construction began in May 1997 and was substantially completed in December 1997. The use of the "Phase I ash residue disposal area" was begun on February 10, 1998. The Hartford Landfill ceased receiving all wastes on December 31, 2008 in accordance with the terms of solid waste permit number 0640824-M. The landfill is currently receiving clean fill and contaminated soil approved by the CT DEP for use in contouring and grading. Work on the closure of the CRRA/Hartford Landfill is on-going at this time.

CRRA leases the Hartford Landfill property from the City of Hartford. The CTDEP transferred the solid waste permit for the landfill to CRRA in 1982 when CRRA leased the property from the City. The facility operates under CTDEP Solid Waste Permits #064-2 through #064-5 and Ground Water Discharge Permit #LF0000014 (DEP/WPC# 064-072), with subsequent renewal application submittals, and Consent Order WC5111, which allows continued operation of the site under the terms of the original permit. Permit #LF0000014 was modified and revised on February 6, 1998 to accommodate both the operation of a ground water flow control system and the Phase I lined ash residue disposal area. A second modification to Permit #LF0000014 requiring sampling of untreated ash residue leachate was issued on May 28, 2002. A detailed site plan showing sampling locations is included as **Figure 2**.

The landfill has various environmental permits, with specific sampling programs and reporting requirements. Copies of all site-specific permits applicable to the environmental monitoring program are included in **Appendix A**.

SCOPE OF SERVICES

Consultant's work shall be inclusive of all environmental monitoring and reporting required at the Hartford Landfill, unless otherwise indicated. Monitoring and reporting will be required for a three (3) year period starting July 1, 2010 and ending June 30, 2013.

Costs for monitoring work shall also include but are not limited to sample bottle preparation and delivery, sample collection, laboratory analysis, and reporting as further described in this Scope of Services.

The environmental media to be sampled under this Scope of Services include ground water, surface water, collected ash residue leachate, persistent landfill leachate seeps (if present), and stormwater. All sampling will be performed to meet the requirements of all applicable permits issued to the Hartford Landfill/CRRA by the federal, state, and local permitting authorities, as applicable. Refer to **Appendix A** for site-specific permit information. Specific environmental monitoring procedures will be performed in accordance with the details of the "Compliance Monitoring Plan - Hartford Landfill," which was approved by the CTDEP on January 26, 1998 and which is referenced in CTDEP Permit No. LF0000014. A copy of the "Compliance Monitoring Plan – Hartford Landfill" is available for review at CRRA's main office, and will be provided to the selected Consultant at the beginning of the contract period. All sample analyses shall be conducted by an analytical testing laboratory certified to perform such analyses by the State of Connecticut. The analytical testing laboratory will be subcontracted directly by the Consultant and approved by CRRA.

All work will be conducted pursuant to all applicable state and federal regulations and guidelines concerning groundwater, surface water, stormwater and sanitary discharge sampling, monitoring and analysis. Consultant is to be familiar with and have reviewed all applicable landfill permits and requirements for site monitoring issued by CTDEP (and EPA, where applicable). Consultant shall be familiar with representative past monitoring reports prepared for the Hartford Landfill and shall prepare monitoring reports consistent in format with past monitoring reports. Consultant shall provide summary tables of data results, and reference drinking water standards and Connecticut Remediation Standards (i.e., Surface Water Protection Criteria) for monitoring wells, and surface water Numerical Criteria contained in the Connecticut Water Quality Standards. Consultant shall also be responsible for the timely submittal of sanitary discharge and stormwater discharge data to CRRA so that CRRA can meet its regulatory reporting obligations.

In accordance with the environmental permits for the Hartford Landfill, Consultant shall conduct the monitoring program for the sampling points and parameters as summarized in **Tables 1 through 4**, on a quarterly basis except as otherwise indicated. In some instances, monitoring points may be inaccessible for regularly scheduled quarterly monitoring, such that arrangements should be made to sample the location(s) at other times. If it is not possible to sample in a timely manner within the quarterly monitoring event timeframe, CRRA will not be charged for sample collection and laboratory analysis for those portions of work <u>not</u> completed.

The environmental monitoring will include but not necessarily be limited to the following elements:

- Preparation for sampling, including bottle preparation, field parameter measurement equipment, sample collection equipment, and means of access to sampling points.

- Completion of field data sheets for each sample point, modified as applicable for each type of sample point.

- Completion of a synoptic groundwater measurement event on the first day of each monitoring event to determine the groundwater elevations. During the January and July monitoring events, the synoptic measurement events will be completed at all twenty-five (25) sampled wells; during the April and October monitoring events, the synoptic measurement event will be completed at all fifty-three (53) monitoring wells that are in the monitoring well network The synoptic groundwater measurement event is to be completed prior to any purging and sampling activities.

- Measuring of field parameters, and collection of samples in bottles for laboratory analysis and appropriate field and laboratory QA/QC in accordance with applicable CTDEP and EPA regulations and guidance.

- Preservation and transport of samples to the laboratory.

- Analytical laboratory analyses of collected samples.

- Entering analytical results and other pertinent sample and/or laboratory test data into a database. Provide an electronic copy of the database to CRRA at the end of each calendar year to accompany the annual report, and after the completion of the April 2013 sampling event (i.e., the final sampling event under this Scope of Work).

- Data review and verification, cursory check for outliers, extreme exceedances and notification to CRRA of unusual results or "Significant Environmental Hazard" conditions under Public Act 98-134.

- Preparation of graphs and tables of data results, maps of sampling locations, groundwater elevation contours and isopleths of monitoring results as appropriate.

- Preparation of summary reports on status of each sample point and site environmental conditions.

- Preparation of draft quarterly and annual reports for CRRA review and comment prior to report finalization.

- Finalization of reports to incorporate CRRA comments, duplication and distribution.

The Consultant is responsible for maintaining clear access to all wells (i.e., by cutting back brush and trimming weeds and grass). Consultant is also responsible for maintaining well markers (i.e., stakes and flagging) to assist field personnel in locating the wells.

The environmental monitoring program is outlined by task below for the Hartford Landfill with a description of the series of tasks to be completed. The format of the Not-To-Exceed Bid Price Form is consistent with the task listing that follows.

TASK 1: QUARTERLY ENVIRONMENTAL MONITORING, ANALYSIS, REPORTING AND ANNUAL REPORTING

Groundwater discharge permit LF0000014 requires that quarterly monitoring of the ground water, surface water, and untreated leachate be completed. The activities under Task 1 of this Scope of Services describe the quarterly monitoring activities.

Task 1.1: Sampling and Documentation of Field Activities

Sampling Schedule

Quarterly environmental sampling of site ground water, surface water, and untreated leachate is to be performed in the following months:

- January
- April
- July
- October

Sampling of groundwater, surface water and untreated leachate can begin on the 1st day of the quarterly sampling month and must be completed by the last day of the quarterly sampling month.

Monitoring of Ground Water Wells

There are twenty-five (25) groundwater monitoring wells (including two piezometers) at the Hartford Landfill that are monitored on a quarterly basis. **Table 1** summarizes the characteristics of each well. Consultant is responsible for supplying all equipment to the site as required for each quarterly monitoring event and its storage at a safe off-site location by Consultant's arrangement. More specifically, the following items are highlighted for each quarterly sampling event:

- Keyed-alike well locks will be provided for all wells by CRRA. Access to buildings will have to be coordinated on a case-by-case basis.

- Permission to access off-site monitoring wells and surface waters will be coordinated through CRRA at the initiation of the monitoring contract. Access to some wells is by foot only, because of location and/or restrictions of vehicle use.

- Consultant shall complete a "Monitoring Well Field Data Sheet" which summarizes well elevation data, well condition, purge data, observed water yield and quality comments, sampling data, and results of measured field parameters. An example of the proposed

"Monitoring Well Field Data Sheet" is to be submitted for approval by CRRA before the first sampling event, at the initiation of the monitoring contract.

- On the first day of each quarterly sampling event, prior to any purging and sampling activities, complete a synoptic groundwater measurement event to determine the groundwater elevations at all twenty-five (25) sampled monitoring wells (during January and July) or at all fifty-three (53) monitoring wells that are in the monitoring well network (during April and October). Measure water elevation data at all monitoring wells prior to well purging using decontaminated equipment (depth to water, depth to bottom, depth of sample) referenced to top of PVC (or casing) and record on the data sheet.

- Provide an in-line meter (or equivalent methodology which mitigates exposure to the atmosphere) to concurrently measure pH, temperature, specific conductivity, dissolved oxygen (DO), and redox potential (RP), as applicable, during purging. Also, provide a device to measure turbidity. A minimum of four (4) readings of each parameter shall be taken and recorded during purging.

- Perform purging using dedicated bladder pump equipment at low flow rates, not taking the first reading until at least one pump volume plus one discharge tubing volume have passed. The purged groundwater may be discarded to the ground at the landfill. Sampling personnel are to monitor the drawdown in the wells and ensure that the drawdown is maintained at less than or equal to 0.3 feet during the entire purging and sampling process. Wells shall be purged at a rate of less than or equal to 300 ml/minute. Field parameter readings shall be recorded at a minimum of three minute intervals, until turbidity is stabilized such that three consecutive reading are within 10% of each other for readings >10 NTU, or readings are within 2 NTU of each other for readings <10 NTU. Per EPA's SOP, if the turbidity has not stabilized after four hours of purging, collect samples and provide full explanation of attempt to achieve stabilization. Provide a summary of periodic readings and time of reading for all parameters.

- Sample collection should proceed from high parameter volatility to low parameter volatility at a low flow rate. Samples for volatile parameters should be transferred slowly to the sample container to eliminate creation of air bubbles. Samples are to be collected in proper containers and properly preserved in the field.

- No filtering of groundwater samples is to occur except where analysis of dissolved metals is specified. Where analysis of dissolved metals is specified, sample filtration is to be performed in the field

during sample collection with an in-line 0.45-micron filter.

- Record all observations relating to the well sampling and any deviations from the sampling plan.

Surface Water Sampling

A total of thirteen (13) surface water samples need to be collected from seven river transect locations and analyzed on a quarterly basis. Transects T-1, T-2, and T-3 are located on the Connecticut River (Note: There are three sample locations along each of the Connecticut River transects). Transects T-4, T-5, and T-6 are located on Meadow Brook, and transect T-7 is located at the mouth of Deckers Brook (Note: There is one sample location along each of the Meadow Brook and Deckers Brook transects). There are no transect markings in place; therefore, the Consultant is responsible for locating each surface water sampling location in the field based upon the transect location descriptions included in Permit LF0000014. It is important to note that vertical composite samples are to be collected at each sample location except transect T-2, where three horizontal composite samples are to be collected.

Consultant is responsible for providing a variable speed peristaltic pump or equivalent for collection of surface water samples. Surface water sampling shall proceed from downstream locations to upstream locations. For those surface water locations where a boat is required for sampling, samples shall be taken upstream of the boat's engine. A weighted tape measure shall be attached to the tubing so that depth of sample collection (and bottom depth) can be determined and recorded. Clean tubing shall be used at each sample location. The pump shall be operated at 300-500 ml/min and allow at least one (1) pump and tubing volume to pass through prior to sample collection. No filtering of surface water samples is to occur except where analysis of dissolved metals is specified. Where analysis of dissolved metals is specified, sample filtration is to be performed in the field during sample collection with an in-line 0.45-micron filter.

The Consultant will also be responsible for gauging stream flows at transects T-6 (Meadow Brook) and T-7 (Deckers Brook) at the time of sample collections. Additionally, the Consultant will be responsible for obtaining river gauge information from the U.S. Geological Survey for the Connecticut River for the day of sampling.

A field data sheet shall be completed for each sample location. Field measurements of water temperature, air temperature, pH, specific conductance, salinity and dissolved oxygen shall be recorded. Gauged river flows, time of sample collection and other field data to be measured and recorded are to follow the permit requirements.

Ash Leachate Sampling

Consultant is responsible for collecting grab samples of untreated ash leachate from the leachate lift station associated with the Ash Residue Disposal Area. The Consultant shall use decontaminated bailers and clean rope to collect the leachate samples. Field measurements of pH, specific conductance, dissolved oxygen, turbidity, and leachate temperature shall be recorded. A field data sheet shall be completed to document the field results of the leachate sampling.

Leachate Seep Sampling

Up to four (4) "persistent" leachate seep locations may be sampled during each quarterly sampling event from various parts of the landfill. The Consultant should contact CRRA prior to each quarterly site visit to obtain the number of possible sampling locations, based on CRRA's monthly surface inspection reports. CRRA will only be charged for seep sample collection and analyses based on the number of seeps that are actually sampled each quarter.

Grab samples of leachate seeps are to be collected for analysis. When possible, based on the actual volume of each sample collected, field measurements of pH, specific conductance, dissolved oxygen, turbidity, and leachate seep temperature shall be recorded. A field data sheet shall be completed to document the field results of the leachate seep sampling.

Preparation for Sampling

This task includes coordination between field monitoring personnel and the analytical laboratory for the bottle order, bottle delivery, sample preservation and chain of custody to complete the required sampling. In addition, the Consultant is responsible for mid-quarter monitoring if there is an exceedance of any of the four compliance parameters (alkalinity, hardness, total dissolved solids, and ammonia) at any of the eight (8) Compliance Monitoring Wells (see Columns (1) and (3) of Table 2).

Sample collection scheduling shall allow enough time for completion of the sample analyses by the laboratory so that the quarterly reports can be assembled, reviewed, finalized and submitted in a timely manner according to permit requirements as further discussed below.

Consultant is responsible for coordinating equipment blanks, field blanks, trip blanks and duplicate samples as part of the sampling quality assurance program. In addition to any other approved EPA or CTDEP protocols, equipment blanks and field blanks are required for each day of sampling where non-dedicated equipment is used. Laboratory-supplied reagent water is to be passed through/poured over decontaminated sampling equipment at the beginning of the sampling day (equipment blank) and at the end of the sampling day (field blank) and collected for analysis. It is important to note that reagent water collected as an equipment or field blank sample for analysis of dissolved metals

must be run through the sample device and the field filter. Trip blanks, as supplied by the laboratory, are to be carried on each day that samples are collected for analysis of VOC's, and returned unopened with the samples for analysis of VOC's. The objective of duplicate samples is to check the accuracy of the analytical laboratory. One (1) blind duplicate sample is to be collected each quarter from one of the Surface Water Protection Wells and analyzed for all the same parameters as the sampled well (see Column (4) of **Table 2**).

Each monitoring well is equipped with a dedicated 2-inch diameter Timco bladder pump (SS/Teflon bladder pumps). The pumps are owned by CRRA. The Consultant shall supply all equipment necessary to operate the bladder pumps. Such equipment may include but not necessarily be limited to bladder pump controllers, oil-less air compressors, inert gas packs to drive the pump bladders, pneumatic hoses and fittings. It is the Consultant's responsibility to maintain the CRRA-owned pumps in good working order. This Scope of Services does not include costs associated with repairs to CRRA-owned pumps that may be necessary due to normal wear and tear. If the CRRA-owned pumps require maintenance, repair or replacement, the Consultant must notify CRRA, provide a price quote for the necessary work, and proceed with the work only after receiving approval from CRRA.

Consultant shall provide all required equipment, besides that which CRRA owns and has supplied to the Consultant, for collection of samples to fill laboratory-supplied bottles. The Consultant shall also supply equipment required for measurement of field parameters. Field equipment calibration and decontamination shall be the responsibility of the Consultant. The Consultant shall supply any other equipment necessary to adequately and properly complete the work.

Field Measurements and Collection of Samples

This task includes measuring selected parameters in the field and collecting samples in laboratory-supplied bottles, varying with the sampling point's parameter matrix. Refer to **Table 2** for a summary of field and laboratory parameter requirements for each groundwater and surface water sampling point at the Hartford Landfill, as well as for leachate seep sampling locations. **Table 1** provides summaries of monitoring well completion details with total well depth and screened interval depth of each monitoring well. Refer to **Table 3** for a summary of field and laboratory parameter requirements for the untreated ash leachate sampling point (lift station) at the Hartford Landfill.

Consultant shall follow the "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846" (latest edition) and "RCRA Groundwater Monitoring" Draft Technical Guidance (latest edition) as well as all applicable CTDEP and USEPA regulations. Procedures described herein are not intended to be comprehensive, but to provide a clarification or to supplement the referenced regulations as they might pertain to certain site conditions. The various

subsections below describe particulars for sampling at various types of sample locations.

Sampling methods described herein are to be utilized by Consultant during water quality monitoring events including monitoring of groundwater, surface water, and untreated ash leachate. Specific items that shall be performed during all water quality monitoring events and summarized in the quarterly reports include the following:

- Documentation of Field Activities
- Sample Handling
- Decontamination Procedures
- Monitoring and Sampling Techniques
- Field Quality Control Checks

Documentation of Field Activities shall include listing the procedures used to record data about the sampling event, the sampling locations, the samples themselves, and the handling and transport of the samples.

Sample Handling shall detail the source of the sample containers, sample preservation methods, and the chain-of-custody protocol that is followed from time of sample collection until sample acceptance by the laboratory performing the analysis.

Decontamination Procedures shall provide general data on field and in-house decontamination. Non-dedicated equipment used for purging, sampling, and filtering (to be completed only for analysis of dissolved metals) is to be decontaminated (unless replaced) between each sampling location. For the groundwater monitoring wells, each purging device is effectively "dedicated" to each sampling location. It is recommended in those instances where pumps are dedicated to individual wells, that they receive a thorough in-house decontamination as conditions warrant.

Monitoring and Sampling Techniques for groundwater, surface water, landfill leachate seeps (when present) and untreated ash leachate shall include a description of the fundamental procedures for collection of samples. Specific procedures to be addressed include water level measurement; purging calculations, sample collection equipment and techniques utilized; and monitoring of field parameters (i.e., pH, temperature, specific conductivity, etc.) and their results. Surface water monitoring and sample techniques shall describe the order of sample collection, orientation of boat to sampling points, equipment purging, monitoring of field parameters, method of filtering for dissolved metals and sample collection techniques.

Field Quality Control Checks shall describe typical QA/QC samples and their use. Monitoring events will include trip blanks, equipment blanks and field blanks (as necessary), and duplicate samples. The trip blank is only associated with days when groundwater well and untreated leachate monitoring is performed, because VOC's are not analyzed in surface waters. The equipment and field blanks are only necessary when non-dedicated sampling equipment is utilized for well purging, groundwater sample collection, or surface water sample collection. One (1) blind duplicate sample is to be collected each quarter from one of the Surface Water Protection Wells and analyzed for all the same parameters as the sampled well (see Column (4) of **Table 2**).

Except where sample analysis in accordance with methods in 40 CFR Part 136 is required by permits, the methodologies to be utilized should be consistent with 40 CFR Part 258, Subpart E, Section 258.53 through 258.56, and as further detailed in EPA 530-R-93-017, "Solid Waste Disposal Facility Criteria - Technical Manual," November 1993; CTDEP's "Solid Waste Management Program Description", July 1993; USEPA's "RCRA Ground Water Monitoring Technical Enforcement Guidance Document", September 1986; and US EPA Region I Standard Operating Procedure GW-001 – "Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells" (January 19, 2010 – Revision 3).

Task 1.2: Quarterly Laboratory Analysis

All sample analyses required by this permit shall be performed by a laboratory certified for such analyses by the Connecticut Department of Public Health or, in advance of any use, a laboratory approved in writing by the CTDEP. The laboratory shall analyze all samples submitted from the same monitoring event, at one time, such that duplicate samples and blanks are analyzed under the same conditions.

Preservation and Transport of Samples to Laboratory

Samples shall be properly preserved and kept cool. They shall be transported to the laboratory the same day they are collected per coordination with the lab by the Consultant's field personnel. Container types, preservatives and maximum holding times shall be per CTDEP Reasonable Confidence Protocols (RCP), SW-846 (latest edition), or 40 CFR 136, as applicable. Consultant is to coordinate re-sampling, at no additional cost to CRRA, if re-sampling is necessary due to loss of sample in bottle transport or in laboratory handling, or if the maximum holding times are exceeded.

Analytical Methods and Detection Limits

Analytical results for each parameter shall be reported together with the analytical method, method detection limits, date of analysis, and initials of analyst. The latter two items are specifically required for the sanitary discharge permit reporting. The value of each parameter shall be reported to the maximum level

of accuracy and precision possible. Failure to submit data in accordance with the procedures and protocols set forth in the applicable permits shall constitute a permit violation.

Analyses required under the groundwater, surface water, and untreated ash leachate monitoring programs shall be performed using the methods specified, unless an alternative method has been specifically approved in writing by the CTDEP for monitoring at the facility. The groundwater, surface water, and leachate seep analytical parameters are specified in **Table 2**, while the untreated ash leachate analytical parameters are specified in **Table 3**. Failure to use the analytical method specified or approved by the Commissioner of CTDEP shall constitute a permit violation.

Monitoring required of surface water and groundwater which specify the use of analytical methods as listed in the permits and summarized in **Table 2** must be conducted to achieve the minimum detection levels for each of the parameters, where identified, unless an alternative method that is capable of achieving the minimum detection levels has been specifically approved in writing by the CTDEP.

The minimum detection levels specified in **Table 2** represent the concentration at which quantification must be achieved and verified during the chemical analyses for these compounds, as required by relevant permit(s). It is important to note that, for some parameters, the permit-required detection limits listed in **Table 2** may be higher than those parameters' Groundwater Protection Criteria and/or Surface Water Protection Criteria, as established in the CTDEP's Remediation Standard Regulations (RSR's). In this situation, the minimum detection level achieved by the laboratory must be at least as low as the lowest applicable RSR criterion. [Note: Groundwater samples for Ethylene Dibromide (EDB) and 1,2-Dibromo-3-chloropropane (DBCP) need only be analyzed via RCP Method 8260; analysis for EDB and DBCP via EPA Method 504.1 is <u>not</u> required.]. Analyses must include calibration points at least as low as the minimum detection level. Check standards within ten percent of the minimum detection level may be used in lieu of a calibration point equal to the minimum detection level.

If any sample analysis indicates that quantification for a particular parameter can not be verified at or below the permit-specified minimum level, a second sample shall be collected and analyzed for that parameter according to the above specified methodology as soon as practicable but no later than thirty (30) days following collection of the sample for which the quantification at or below the minimum level was not verified. The results of the first and subsequent sample analyses shall be submitted to the CTDEP verifying that the appropriate methodology was employed, the minimum level was achieved for quality-control samples and that failure to quantify the parameter at or below the minimum level specified for the analysis was a result of matrix effects

which could not be compensated for as part of sample analysis allowed pursuant to 40 CFR Part 136.

If any three (3) samples collected in a twelve-month period indicate that the specified minimum level was not achieved for a particular parameter when using the specified test methodology, the Consultant shall, after consultation with and approval by CRRA, submit a report for the review and approval of the CTDEP which justifies and defines the matrix effect upon analyses for that parameter, identifies the level at which quantification can be verified and recommends modification(s) to the method or an alternative method that is sufficiently sensitive and free of the identified matrix effect.

Review of Lab Results, Quality Control Procedures and Invoices

Consultant is responsible for ensuring lab analyses are performed as required by the parameter list and that MDL limits are met. A summary of the lab's QA/QC procedures and results are to be reviewed and included in the quarterly report. The laboratory must also provide signed "Laboratory Analysis QA/QC Certification Forms" that certify that the all reported data meet the CTDEP's requirements for "reasonable confidence." Consultant is to review the laboratory invoices for consistency with actual sample parameter analyses requested and completed.

Task 1.3: Quarterly Reports - Water Quality Monitoring

The following deadlines apply to the submission of finalized quarterly reports to the appropriate regulatory agencies:

Sampling Event	Report Deadline
January	March 15
April	June 15
July	September 15
October	December 15

Sampling shall be arranged to allow for a reasonable laboratory turnaround time for analysis and compiling of lab results, writing draft report, reviewing draft report, finalizing report and distributing report to appropriate parties.

The quarterly report shall include the monitoring results of all groundwater, surface water, leachate seeps (if applicable) and untreated ash leachate samples that were analyzed. In the text of the report and in summary tables, the Consultant will also indicate which parameters exceed criteria appropriate to the sampling point of classification. This will include state and federal limits for maximum contaminant levels not to be exceeded in the aquifer(s) at the relevant point of compliance (per Subtitle D and permit requirements), groundwater and surface water protection criteria per CTDEP regulations in accordance with the classifications of the same, and aquatic life criteria for surface water locations. Additionally, the Consultant shall evaluate all

monitoring results against the "Significant Environmental Hazard Reporting" criteria under Public Act 98-134.

Any mid-quarter re-sampling required because of exceedances of compliance parameters under Permit No. LF0000014 shall be described in the current quarterly monitoring report if the results of the re-sampling are readily available at the time of report preparation.

The quarterly reports must include an assessment of the conditions of the groundwater monitoring wells and other sampling locations as applicable. The quarterly reports will also include a summary table of groundwater well construction details, and a site map which shows groundwater contours in both overburden and bedrock sampling locations on an AutoCAD drawing of the site that includes site features and topography. CRRA will provide an AutoCAD drawing of the landfill site for use by Consultant upon request.

During April and October, ground water elevation data will be collected at all available wells in the project vicinity as described in Task 1.4, regardless of whether or not the well is in the sampling program. The measured groundwater elevations at the additional well locations will be included on the groundwater contour maps for the April and October sampling events. A Monitoring Well Field Data Sheet shall also be completed for each additional well.

Each quarterly report shall fully document the field activities and the laboratory work details, be formatted to support the annual report, and provide interim results and an update on impacts and exceedances. CRRA shall be notified immediately of any significant variation from past results, exceedances of "Significant Environmental Hazard Reporting" criteria, or exceedances of compliance parameters with a recommendation on confirmation of the result.

A copy of the draft quarterly report, including sampling details and supporting analytical data, sample chains of custody, Monitoring Well Field Data Sheets, and a site map of groundwater elevations and possibly isopleths of results, is due to CRRA for review a minimum of fourteen (14) calendar days before the final report is due to the CTDEP. CRRA shall also be allowed sufficient time to review any other reports or forms prior to submittal to CTDEP.

Finalized quarterly reports are to be printed by the Consultant on double-sided pages. The report distribution and addresses will be provided. Six (6) finalized hard-copies of each report plus one electronic copy (PDF format) are required to be generated by the Consultant. The Consultant is responsible for mailing reports directly.

Task 1.4: Non-Sampled Well Condition Survey & Water Elevations

There are twenty-eight (28) ground water monitoring wells at the Hartford Landfill that are not part of the quarterly sampling program as outlined herein. During the April and October sampling events, the ground water elevation shall be measured at each of the non-sampled wells, and a Monitoring Well Field Data Sheet (as de-

scribed in Task 1.1) shall be completed to document each non-sampled well's condition. The groundwater elevations obtained at the non-sampled well locations should be used to supplement the groundwater contour maps developed as part of the applicable quarterly environmental monitoring report. Copies of the Monitoring Well Field Data Sheets shall be included in the applicable environmental monitoring report.

Task 1.5: Interim Quarterly Event Monitoring – Groundwater Zone of Compliance

If an exceedance of the previously-established maximum background levels for alkalinity, hardness, total dissolved solids and/or ammonia is found at any of the eight (8) compliance monitoring wells (as defined in permit LF00000014), Consultant shall re-sample the well(s) of exceedance(s) for the parameter(s) exceeded within 45 days of the quarterly sampling event. The analytical results of any re-sampling must be submitted to CRRA by the Consultant within 30 days of the re-sampling date, along with a letter explaining the source and cause of the exceedance (if the re-sampling confirms that there has been an exceedance) and any extenuating circumstances surrounding the sampling or re-sampling activities.

Task 1.6: Annual Dioxin/Furan Monitoring, Laboratory Analysis and Reporting

MW-DX is a stainless steel monitoring well located adjacent to MW-106 on the Connecticut River side of the U.S. Army Corps of Engineers dike. Permit LF0000014 requires that MW-DX be sampled for dioxins and furans annually, in July of each monitoring year. It is important to note that MW-DX is not equipped with a bladder pump. The Consultant must therefore utilize a stainless steel bailer to purge and sample MW-DX. At least three (3) well volumes must be extracted from MW-DX prior to sampling.

Consistent with the sampling and documentation requirements described above in Task 1.1, the Consultant will also be responsible for monitoring "field parameters" at MW-DX during well purging, and for completing a "Monitoring Well Field Data Sheet" which summarizes well elevation data, well condition, purge data, observed water yield and quality comments, sampling data, and results of measured field parameters for MW-DX.

Task 1.7: Annual Reports - Water Quality Monitoring

The annual report shall address the zone of influence of the discharge (defined as the area of soil and groundwater within which the treatment of the leachate by soils and mixing of leachate with groundwater occurs and could be reasonably expected to occur, and therefore within which some degradation of groundwater quality is anticipated to occur). The annual reports shall also provide an overall assessment of site conditions for the calendar year, including but not limited to the following:

(a) Map depicting all groundwater and surface water monitoring locations, groundwater withdrawal locations, and the locations of the collection, treatment, and conveyance of stormwater, leachate, and gas condensate as applicable;

(b) Evaluation of surface water and groundwater quality, and leachate quality and leachate quantity, including graphical representations of monitoring results;

(c) Condition of all monitoring wells and the need for repair or replacement of any wells;

(d) Evaluation of the extent and potential extent of the leachate discharge to groundwater, and whether any impact on the surface water quality of the Connecticut River, Meadow Brook, or any other surface waters was detected or could reasonably be expected to occur;

(e) Evaluation of the performance of the Groundwater Flow Control System and its ability to maintain possession of the zone of influence; and

(f) Written request for modification of the surface water and/or ground water monitoring program, as warranted by the data generated through the monitoring.

All annual reports are to be submitted as a draft to CRRA at least fourteen (14) calendar days prior to the submittal deadline of January 1st specified in the permit. CRRA shall be supplied with electronic copies of all information (i.e., chemical parameter database) included in the final annual report as well as groundwater contour maps and other miscellaneous site plans in AutoCAD files.

Finalized annual reports are to be printed by the Consultant on double-sided pages. The report distribution and addresses will be provided. Six (6) finalized hard-copies of the annual report plus one electronic copy (PDF format) are required to be generated by the Consultant. Consultant is responsible for mailing reports directly.

TASK 2: SANITARY DISCHARGE MONITORING, LABORATORY ANALYSIS AND REPORTING

Task 2.1 Sanitary Discharge Sampling

Sanitary sewer discharge permit number SP0001412 requires that monthly monitoring of the ash residue leachate discharge (DSN 001A) and the pumped groundwater discharge (DSN 001B) be completed. Permit SP0001412 requires that separate sets of grab samples of each discharge be collected from the following monitoring locations:

- DSN 001A: Influent pipe to the ash leachate treatment tank (a sample port has been installed); and,

- DSN 001B: At manhole prior to mixing with DSN 001A (from a manhole downstream of the pumped groundwater discharge, and DSN 001A must be inactive during sampling of DSN 001B).

The Consultant shall coordinate the schedule for sample collection with CRRA personnel at the site.

Task 2.2: Laboratory Analysis

Samples shall be appropriately preserved and kept cool. They shall be transported to the laboratory the same day they are collected per coordination with the lab by Consultant. Container types, preservatives and maximum holding times per 40 CFR 136, latest revisions, shall be followed. Consultant is to coordinate re-sampling at no additional cost to CRRA, if re-sampling is necessary due to loss of sample in bottle transport or in laboratory handling, or if the maximum holding time is exceeded. Samples shall be analyzed for the parameters listed in **Table 3**. Analytical methods shall be in accordance with the methods listed in **Table 3**, as required by Permit No. SP0001412.

Consultant is responsible for ensuring lab analyses are performed as required by the parameter list and that required methods are utilized. A summary of the lab's QA/QC procedures and results are to be reviewed. Consultant is to review the laboratory invoices for consistency with actual sample parameter analyses requested and completed.

Task 2.3: Reporting

CTDEP reporting requirements specify that CRRA is required to submit Discharge Monitoring Reports (DMR's) summarizing chemical analyses to the CTDEP on a monthly basis. The DMR's must be submitted by CRRA by the last day of the month following the month that the samples were collected. Therefore, the Consultant is required to provide complete, finalized laboratory reports, sample chains of custody, and sample collection data sheets for the ash leachate and pumped groundwater monitoring to CRRA by the twentieth (20^{th}) day of the month following the month that the samples were collected.

TASK 3: STORMWATER DISCHARGE SAMPLING, ANALYSIS & REPORTING

The Hartford Landfill is registered under the "General Permit for the Discharge of Stormwater Associated with Industrial Activity", issued October 1, 2002, modified July 15, 2003, and re-issued on April 14, 2009. The permit registration number for the landfill is GSI000500.

In accordance with the General Permit, stormwater samples are to be collected and analyzed on an annual basis. Annual sampling is to be completed by June 30^{th} of each year. There are a total of four (4) locations that must be sampled annually. Refer to **Figure 2** for a map depicting the sampling locations.

Task 3.1: Stormwater Sampling

The General Permit requires that grab samples of stormwater be collected for analysis. The Consultant will also be required to collect a sample of uncontaminated rainfall, as required by the General Permit. The grab samples are to be collected from the sampling locations specified in the Stormwater Pollution Prevention Plan (SPPP) that has been prepared for the landfill (refer to **Figure 2**). The Consultant is responsible for following proper sampling protocols outlined in the General Permit to ensure that all collected samples are representative of the discharges and that contaminants are not artificially introduced into the samples.

Task 3.2: Laboratory Analysis

Samples shall be appropriately preserved and kept cool. They shall be transported to the laboratory the same day they are collected per coordination with the lab by Consultant. Container types, preservatives and maximum holding times per 40 CFR 136, latest revisions, shall be followed.

Both chemical analyses and acute toxicity biomonitoring shall be completed at each sampled outfall per the General Permit requirements. It is important to note that the samples from the four landfill outfalls must also be analyzed for the parameters specified in 40 CFR 445 (Landfill Point Source Category). All stormwater monitoring parameters are specified in **Table 4**.

Consultant is responsible for ensuring lab analyses are performed as required by the parameter list and that required methods are utilized. A summary of the lab's QA/QC procedures and results are to be reviewed. Consultant is to coordinate re-sampling at no additional cost to CRRA, if re-sampling is necessary due to loss of sample in bottle transport or in laboratory handling, or if the maximum holding time is exceeded. Consultant is to review the laboratory invoices for consistency with actual sample parameter analyses requested and completed.

Task 3.3: Reporting

CRRA is required to submit Stormwater Monitoring Reports (SMR's) to the CTDEP within ninety (90) days of the sampling event. In order to meet this reporting requirement, the Consultant shall provide finalized laboratory reports, laboratory QA/QC results, sample chains of custody, and stormwater event data (i.e., sample date and time, sampler's name, magnitude of storm event, date and magnitude of previous storm event, etc.) to CRRA within forty-five (45) days after the sampling event.

TASK 4: DIKE STABILITY MONITORING AND REPORTING

A quarterly stability monitoring program assesses possible effects of the placement of solid waste against the interior of the U.S. Army Corps of Engineers flood control dike (the North Meadows Flood Control Dike), which separates the Hartford Landfill from the Connecticut River and Meadow Brook. The quarterly (January, April, July, and October) sta-

bility monitoring activities (as detailed below) include measurements of soil pore pressures, lateral ground movements, and horizontal and vertical displacement of surveyed monuments, as well as the completion of cross-sectional surveys and an annual report.

Measurement of Pore Pressure

Soil pore pressures are monitored quarterly at five (5) piezometers pairs (shallow & deep) located on the outside of the dike. CRRA will supply the "Sinco" pneumatic - pressure transducer for monitoring purposes. Consultant shall provide the gas source for use with the equipment. Instruction manuals for equipment use will be provided.

Measurement of Lateral Movement

Lateral ground movement in both North/South and East/West directions is measured quarterly at five (5) inclinometers located outside of the toe of the dike. CRRA will supply the "Sinco" digital inclinometer with sensor for monitoring purposes, and a rechargeable 6 volt battery. Instruction manuals for equipment use will be provided.

Measurement of Horizontal and Vertical Displacement

Thirteen (13) covered monuments are located along the crown of the dike (Monument #6 through #18) as reference points to measure for horizontal and vertical displacement. The location of these monuments must be surveyed by a State of Connecticut Licensed Surveyor on a quarterly basis. CRRA will provide Consultant with survey tie-in reference information. **Appendix B** to this Scope of Work contains a copy of the survey specifications.

Dike Cross Section Surveys

Five (5) cross section survey lines have been established from the top of the USACOE dike to the mean high water line of the Connecticut River. These cross-sections must be surveyed by a State of Connecticut Licensed Surveyor on a quarterly basis to make an assessment of possible undermining and/or erosion of the river bank and/or the flood plain between the river and the dike. Quarterly plots of the cross-sections shall be generated.

Data Summaries and Reporting

Quarterly reporting of dike stability data is not required, however, the Consultant is responsible for summarizing and reviewing the quarterly data as soon as possible after it is collected, and promptly notifying CRRA if any unusual data is generated. An annual dike stability report is to be assembled based on contents of past reports and in accordance with the requirements as summarized in the "Hartford Vertical Expansion Permit". A draft of the report is due to CRRA for review and comment by December 15th each year, and the final report incorporating any CRRA comments is due by December 31st each year. A

copy of monitoring results for January and April 2007 will be provided by CRRA to the Consultant. Approximately six (6) hard-copies of the report plus one electronic copy (PDF format) are required to be generated by the Consultant. Consultant is responsible for mailing reports directly.

TABLE 1
Summary of Monitoring Well Construction
(Sampled Wells Only)

Hartford Landfill
Hartford, Connecticut

Well Designation in Permit	Monitor Well	Ground Elevation (ft)	PVC Elevation (ft)	Casing Elevation (ft)	Well Diameter (in)	Well Depth (ft)	Screen Length (ft)	Screen Elevation (ft)	Date Installed
W-17	MW-7	22.7	22.30	22.71	2	29	10	-19 to -29	Not Available
C-8	MW-7B	18.9	20.87	21.19	2	100	10	-81.1 to -71.1	Oct-97
W-9	MW-13	21.6	23.29	23.70	2	40	10	-30 to -40	Aug-87
W-7	MW-14-87	20.3	23.09	23.61	2	32	10	-22 to -32	Aug-87
C-6	MW-14B	20.2	21.93	22.10	2	105	10	-95 to -105	Feb-90
W-6	MW-15-87	20.7	23.67	23.63	2	32	10	-22 to -32	Aug-87
W-3	MW-16M	20.0	22.04	22.24	2	33	10	-13 to -3	Oct-97
W-2	MW-16S	19.9	21.73	22.19	2	24	10	6 to -4	Dec-92
W-11	MW-101	19.8	21.19	21.30	2	33	14	-19 to -33	Nov-83
W-12	MW-102	21.8	22.15	23.03	2	34	19	-15 to -34	Nov-83
W-13	MW-103	19.5	21.26	21.23	2	32	19	-13 to -32	Nov-83
C-7	MW-103B	19.7	21.19	21.37	2	108	10	-88.3 to -78.3	Oct-97
SW-1	MW-104	19.9	22.15	22.31	2	35	19	-16 to -35	Nov-83
W-10	MW-106	21.6	24.33	24.15	2	40	10	-30 to -40	Nov-87
W-16	MW-210	22.4	24.25	24.41	2	33	10	-10.5 to 0.5	Oct-97
W-1	MW-307M	23.0	25.04	25.39	2	14	10	14 to 4	Oct-97
W-4	MW-308M	20.3	22.22	22.85	2	36	10	0 to -10	Dec-92
W-5	MW-309M	22.3	24.13	24.64	2	30	10	5 to -5	Dec-92
W-8	MW-311M	23.5	23.17	25.83	2	35	10	7 to -3	Dec-92
W-15	MW-312M	24.0	26.01	26.35	2	35	5	-2 to -7	Jun-93
C-1	MW-340	15.2	16.64	17.06	2	10	5	4 to 9	May-93
C-2	MW-341M	17.5	19.23	19.39	2	30	10	0 to -10	May-93
C-3	MW-341B	17.4	19.47	19.60	2	86	10	-66.5 to -56.5	Sep-97
C-4	MW-342M	18.7	20.68	18.68	2	24	10	-3.3 to 6.7	Oct-97
C-5	MW-342B	18.6	20.48	18.61	2	90	10	-69.5 to -59.5	Oct-97
C-9 & W-14	PZ-AI	22.49	24.40	-	2	-	22	12.49 to -9.51	Oct-97
C-10 & SW-2	PZ-AE	19.03	21.60	-	2	-	24	12.03 to -11.97	Oct-97

Notes:
Vertical Datum is NGVD '29
ft = feet
in = inches

Table 2
Quarterly Groundwater and Surface Water Monitoring Parameters
Hartford Landfill

	Parameter	Code No.	EPA Method; MDL	(1) C-2, 3, 4, 5, 6, 7, 8	(2) W-3, 6, 14, 17, and Seeps	(3) C-1	(4) W-1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, SW-1, 2	(5) Surface Water
				7 each	4+ each	1 each	13 each + QA/QC	13 each + QA/QC
Field Parameters								
1	Temperature (Water and Air)	00011		X	X	X	X	X
2	pH	00400-012		X	X	X	X	X
3	Specific Conductance	00095-104		X	X	X	X	X
4	Dissolved Oxygen	00300-019		X	X	X	X	X
5	Sample Depth			X	X	X	X	X
6	Depth to Bottom			X	X	X	X	X
7	Stream Flows at S-6, S-7, and CT River	00061						X
Laboratory Parameters								
1	Total Dissolved Solids	70295-019	160.1	X	X	X	X	X
2	Total Suspended Solids	00530-019	160.2	X	X	X	X	X
3	Biochemical Oxygen Demand - 5-Day (BOD-5)	00310-019	405.1					X
4	Specific Conductance	00095-104	120.1	X	X	X	X	X
5	Chloride	00940-019	325.x	X	X	X	X	X
6	Hardness (as CaCO3)	00900-019	130.1 or 130.2	X	X	X	X	X
7	pH	00400-012	150.1	X	X	X	X	X
8	Ammonia (as N)	00610-019	350.2; 100 ppb	X	X	X	X	X
9	Nitrate (as N)	00620-019	352.1	X	X	X	X	X
10	Nitrite (as N)	00615-028	354.1			X	X	X
M-11	Cadmium, Total	01027-028	213.2; 0.5 ppb (GW = 6010)	X	X	X	X	X
M-12	Copper, Total	01042-028	220.2; 5 ppb (GW = 6010)	X	X	X	X	X
13	Copper, Dissolved	01040-028	220.2; 5 ppb			X	X	X
14	Iron, Total	01045-019	236.2; 5 ppb	X	X	X	X	X
M-15	Lead, Total	01051-028	239.2; 5 ppb (GW = 6010)	X	X	X	X	X
16	Lead, Dissolved	01049-028	239.2; 5 ppb			X	X	X
M-17	Silver, Total	01077-028	272.2; 1 ppb (GW = 6010)	X	X	X	X	X
M-18	Zinc, Total	01092-028	289.2; 10 ppb (GW = 6010)	X	X	X	X	X
19	Zinc, Dissolved	01090-028	289.2; 10 ppb			X	X	X
20	Alkalinity	00410-019	310.1	X	X	X	X	X

Table 2 Quarterly Groundwater and Surface Water Monitoring Parameters Hartford Landfill								
				(1)	(2)	(3)	(4)	(5)
Parameter		Code No.	EPA Method; MDL	C-2, 3, 4, 5, 6, 7, 8	W-3, 6, 14, 17, and Seeps	C-1	W-1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, SW-1, 2	Surface Water
				7 each	4+ each	1 each	13 each + QA/QC	13 each + QA/QC
21	Chemical Oxygen Demand (COD)	00341-019	410.x	X	X	X	X	X
22	Sulfate, Total	00945-019	375.x			X	X	X
23	Orthophosphorus, Total	70507-019	365.3			X	X	X
M-24	Antimony, Total	01097-028	204.2; 10 ppb (GW = 6010)	X	X	X	X	X
M-25	Arsenic, Total	01002-028	206.2; 5 ppb (GW = 6010)	X	X	X	X	X
M-26	Barium, Total	01007-028	208.2; 10 ppb (GW = 6010)	X	X	X	X	X
M-27	Beryllium, Total	01012-028	210.2; 1 ppb (GW = 6010)	X	X	X	X	X
M-28	Chromium, Total	01034-028	218.2; 5 ppb (GW = 6010)	X	X	X	X	X
29	Chromium, Hexavalent	01032-028	218.5; 5 ppb			X	X	X
M-30	Cobalt, Total	01037-028	219.2; 5 ppb (GW = 6010)	X	X	X	X	X
31	Manganese, Total	01056-019	243.2; 1 ppb	X	X	X	X	X
32	Mercury, Total	71900-028	245.1; 0.2 ppb			X	X	X
M-33	Nickel, Total	01067-028	249.2; 5 ppb (GW = 6010)	X	X	X	X	X
M-34	Selenium, Total	01147-028	270.2; 5 ppb (GW = 6010)	X	X	X	X	X
M-35	Thallium, Total	01059-028	279.2; 10 ppb (GW = 6010)	X	X	X	X	X
M-36	Vanadium, Total	01087-028	286.2; 10 ppb (GW = 6010)	X	X	X	X	X
37	Sodium, Total	00929-019		X	X	X	X	
38	Potassium, Total	00937-019		X	X	X	X	
39	Volatile Organic Compounds (VOC's)		8260 (see Note)	X	X	X	X	

Notes:

EPA Method; MDL

- ppb = parts per billion
- If a parameter's Groundwater Protection Criterion (GWPC) and/or Surface Water Protection Criterion (SWPC) is lower than the listed MDL, then the MDL must be at least as low as the lower of the GWPC and the SWPC.
- (GW = 6010) indicates that groundwater samples for these 15 metals (inorganics listed in 40 CFR 258 Appendix I) are to be analyzed via EPA Method 6010, not via the surface water method listed.
- VOC's via EPA Method 8260: The VOC analytical parameter list is to include all Organic Constituents listed in Appendix I to 40 CFR 258, all analytes listed in CTDEP RCP Method 8260, and 2-Chloroethyl Vinyl Ether, Chloromethyl Methyl Ether, and 1-Chlorohexane.

Monitoring Well Designations by Column are as Follows:

(1) = "Compliance Wells" MW-341M, MW-341-B, MW-342M, MW-342B, MW-14B, MW-103B, and MW-7B

(2) = "Plume Characterization Wells" MW-16-87, MW-15-87, PZ-A(I), MW-7

(3) = "Compliance Well" and "Surface Water Protection Well" MW-340

(4) = "Surface Water Protection Wells" MW-307, MW-16S, MW-308M, MW-309M, MW-14-87, MW-311M, MW-13, MW-106, MW-101, MW-102, MW-103, MW-104, PZ-A(E)

Other Sampling Notes:

- For QA/QC purposes, one (1) duplicate sample from one of the Surface Water Protection Wells [Column (4) above] is to be collected during each quarterly event and analyzed for all the same parameters as the original sample set.
- For QA/QC purposes, one (1) equipment blank is to be collected each quarter by passing laboratory-grade reagent water over/through the sampling equipment associated with collection of Surface Water samples at the start of the sampling day, and analyzing the collected rinseate for all Surface Water parameters [Column (5) above].
- For QA/QC purposes, one (1) field blank is to be collected each quarter that non-dedicated Surface Water sampling equipment is used. The field blank is to be collected by passing laboratory-grade reagent water over/through the sampling equipment associated with collection of Surface Water samples at the end of the sampling day, and analyzing the collected rinseate for all Surface Water parameters [Column (5) above].
- Persistent Leachate Seeps ("Seeps") to be sampled may vary in number, but should not exceed four samples per quarter, since representative samples can be collected.
- MW-DX (the stainless steel "Dioxin Well") is to be sampled for Dioxins and Furans in July only, on an annual basis.
- Untreated Ash Leachate from the Phase I Lined Ash Residue Area is to be sampled quarterly in accordance with the May 28, 2002 amendment to Permit No. LF0000014. Refer to Table 3 of the Scope of Services for analytical parameters associated with the untreated ash leachate sampling.

TABLE 3
SANITARY SEWER SAMPLING PARAMETERS[1]
Hartford Landfill
Hartford, Connecticut

	CTDEP Permit No. SP0001412, issued October 17, 2007		CTDEP Permit No. LF0000014, issued February 6, 1998 and amended May 28, 2002.
	Phase I	Pumped	Phase I
	Ash Leachate	Groundwater	Ash Leachate
PARAMETER	001-A	001-B	Lift Station
	(Untreated)		(Untreated)
Leachate Indicator Parameters			
Alkalinity	Q	Q	Q
COD	Q	Q	Q
Chloride	Q	Q	Q
Conductivity	Q	Q	Q
N-Ammonia	(M)	(M)	Q
N-Nitrate	(M)	(M)	Q
pH(lab)			Q
TDS	Q	Q	Q
TSS	Q	Q	Q
Metals(Inorganics)[2]			
Aluminum	(M)	(M)	Q
Arsenic	Q	Q	Q
Barium	(M)	(M)	Q
Cadmium	(M)	(M)	Q
Copper (D)	Q	Q	Q
Copper (T)	(M)	Q	Q
Cyanide	Q	Q	Q
Iron (D)	Q	Q	Q
Iron (T)	(M)	(M)	Q
Lead	(M)	Q	Q
Manganese (D)	Q	Q	Q
Manganese (T)			Q
Mercury	Q	Q	Q
Nickel	Q	Q	Q
Potassium	Q	Q	Q
Silver			
Sodium	Q	Q	Q
Zinc	Q	Q	Q
Organics			
VOC's via EPA Method 8260[3]	(M)	(M)	Q

(M) = Monthly Sampling Frequency

Q = Quarterly Sampling Frequency (January, April, July, and October)

Notes:

1. All samples are to be grab samples.
2. All metals are to be analyzed as total (T), unless indicated otherwise by (D) for dissolved.
3. The VOC analytical parameter list is to include all analytes listed in CTDEP RCP Method 8260, plus 2-Chloroethyl Vinyl Ether; Chloromethyl Methyl Ether; 1-Chlorohexane; Trans-1,3-Dichloropropene; and Trichlorofluoromethane.

TABLE 4
STORMWATER SAMPLING PARAMETERS
Hartford Landfill
Hartford, Connecticut

Parameter	Units	Required Analytical Method(s)[1, 2]	Hartford Landfill Outfalls 001, 002, 002A, and 003
Total Oil and Grease	mg/L	Per 40 CFR 136	✓
Chemical Oxygen Demand	mg/L	Per 40 CFR 136	✓
Total Suspended Solids (TSS)[3]	mg/L	Per 40 CFR 136	✓
Total Phosphorous	mg/L	Per 40 CFR 136	✓
Total Kjeldahl Nitrogen	mg/L	Per 40 CFR 136	✓
Nitrate as Nitrogen	mg/L	Per 40 CFR 136	✓
Total Copper	mg/L	Per 40 CFR 136	✓
Total Lead	mg/L	Per 40 CFR 136	✓
Total Zinc[3]	mg/L	Per 40 CFR 136	✓
Aquatic Toxicity (LC_{50})	%	See Note 5	✓
pH[3]	S.U.	Per 40 CFR 136	✓
BOD_5[4]	mg/L	Per 40 CFR 136	✓
Ammonia (as N)[4]	mg/L	Per 40 CFR 136	✓
α-Terpineol[4]	mg/L	Via EPA Method 625	✓
Benzoic acid[4]	mg/L	Via EPA Method 625 or 1625B	✓
p-Cresol[4]	mg/L	Via EPA Method 625 or 1625B	✓
Phenol[4]	mg/L	Via EPA Method 625 or 1625B	✓
pH of Uncontaminated Rainfall	S.U.	Per 40 CFR 136	✓

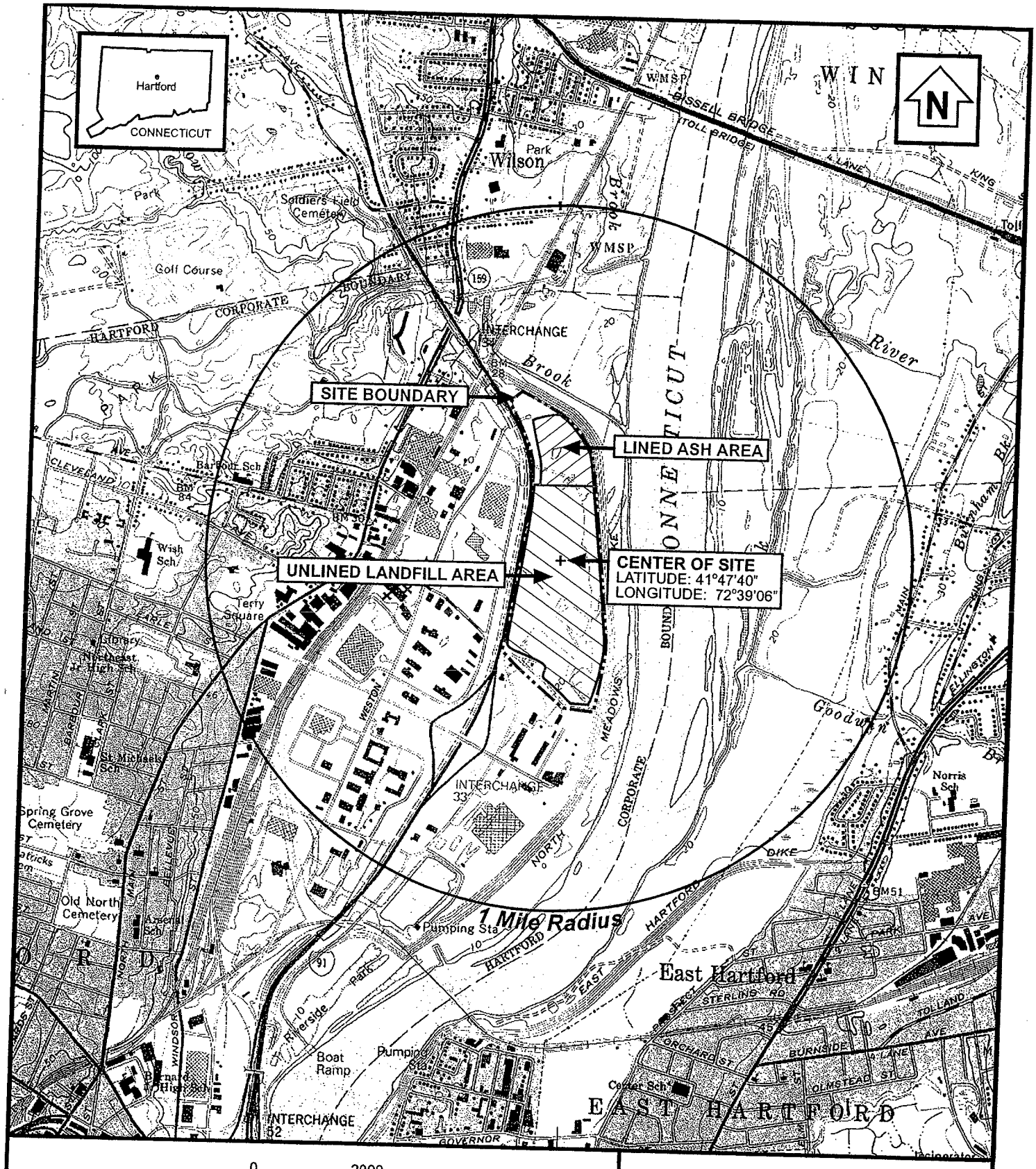
Notes:

1. All chemical analyses shall be performed using methods approved by the USEPA under 40 CFR 136 unless otherwise specified.
2. All chemical analyses shall be performed by a laboratory certified for such analyses by the Connecticut Department of Public Health.
3. TSS, Zinc, and pH are standard General Permit parameters, as well as parameters incorporated through 40 CFR 445.
4. Analysis of these parameters is required by the incorporation of 40 CFR 445 in the General Permit.
5. Acute toxicity biomonitoring shall be conducted according to the procedures specified in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 5th Edition (EPA 821-R-02-012), under the specific conditions listed in the General Permit.

FIGURES

Figure 1: Site Location Plan

Figure 2: Water Quality Monitoring Site Plan



0 2000
SCALE FEET

0 1
SCALE MILE

1:24000

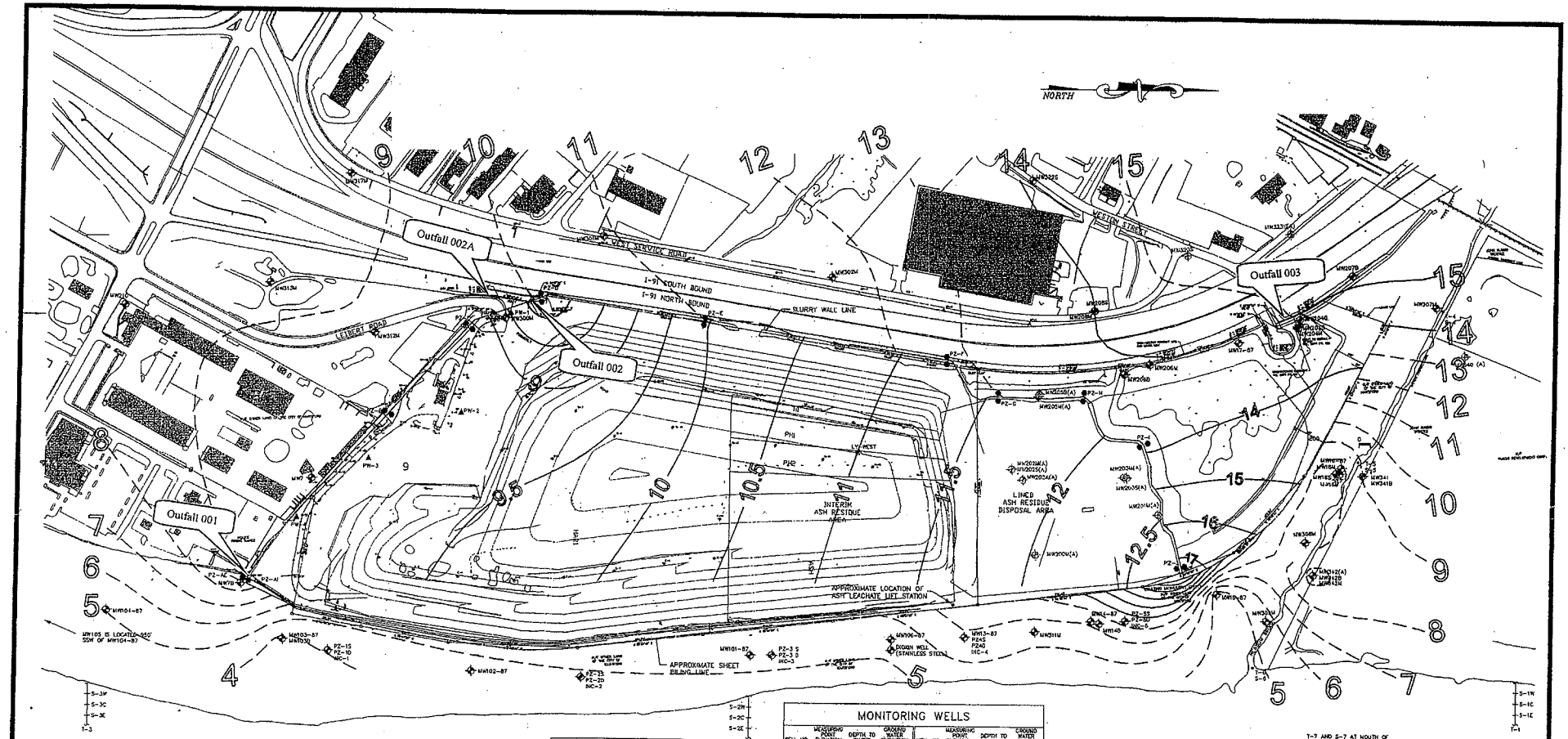
BASE CREATED WITH TOPO™ © 1996 WILDFLOWERS PRODUCTIONS, www.topo.com
7.5' USGS TOPOGRAPHIC MAP OF HARTFORD NORTH QUADRANGLE

CRRA HARTFORD LANDFILL
HARTFORD, CONNECTICUT

FIGURE 1
USGS SITE LOCATION MAP

Date: 10/03 | **Project No.** 21988-0112-00000

C-G/GRAPHICS/CRRA/AIR/32077.FH9



SITE PLAN PREPARED FROM INFORMATION OBTAINED AND MEASUREMENTS TAKEN BY TERRASYN GROUP, INC.

ALL LOCATIONS, DIMENSIONS, AND PROPERTY LINES DEPICTED ON THIS PLAN ARE APPROXIMATE. THIS PLAN SHOULD NOT BE USED FOR CONSTRUCTION OR LAND CONVEYANCE PURPOSES.

HORIZONTAL AND VERTICAL LOCATIONS OF WELLS, AND SELECTED SITE FEATURES DETERMINED THROUGH REPRESENTATIVES OF TERRASYN GROUP, INC.

WATER TABLE ELEVATIONS ARE BASED ON NGVD of 1929.

PIEZOMETER WATER TABLE ELEVATIONS ARE BASED ON MEASUREMENTS MADE BY HRP ON 10/08/03.

WATER TABLE ELEVATIONS ARE BASED ON MEASUREMENTS MADE ON 10/01/03 – 10/08/03

WATER TABLE CONTOURS, AND FLOW DIRECTIONS ASSUME HOMOGENOUS, ISOTROPIC AQUIFER CONDITIONS, AND HORIZONTAL FLOW.

FLUCTUATIONS IN THE LEVEL OF THE WATER TABLE MAY OCCUR DUE TO FACTORS NOT ACCOUNTED FOR AT THE TIME OF MEASUREMENT.

WATER TABLE CONTOURS ARE INTERPOLATED BETWEEN DATA POINTS, AND INFERRED IN OTHER AREAS.

LEGEND

- MW103-87 — MONITORING WELL LOCATION
- MW102-87(A) — MONITORING WELL LOCATION ABANDONED/ DESTROYED
- PZ-F — APPROX. LOCATION OF SLURRY WALL INTERIOR AND EXTERIOR PIEZOMETER PAIRS ALONG SLURRY WALL
- PW-4 — PUMPING WELL
- INFERRED OVERBURDEN GROUND WATER ISOPLETH (OUTSIDE LANDFILL SLURRY WALL AND SHEET PILING)
- INFERRED OVERBURDEN GROUND WATER ISOPLETH (INSIDE LANDFILL SLURRY WALL AND SHEET PILING)
- S-3W — SURFACE WATER SAMPLE WEST
- S-3C — SURFACE WATER SAMPLE CENTER
- S-3E — SURFACE WATER SAMPLE EAST
- T-3 — TRANSECT LINE

WELL NO.	MEASURING POINT ELEVATION	DEPTH TO WATER	GROUND WATER ELEVATION
PZ-A(I)	24.40	15.37	9.03
PZ-A(O)	21.60	12.44	9.16
PZ-B(I)	23.09	13.81	9.28
PZ-B(O)	22.24	12.74	9.50
PZ-C(I)	23.11	13.58	9.53
PZ-C(O)	21.70	12.05	9.65
PZ-D(I)	19.85	11.84	7.81
PZ-D(E)	19.39	9.14	10.25
PZ-E(I)	23.49	13.5	9.99
PZ-E(O)	21.30	10.27	11.03
PZ-F(I)	26.08	14.85	11.23
PZ-F(O)	24.50	11.62	12.88
PZ-G(I)	25.95	24.4	11.55
PZ-G(O)	37.78	19.75	13.04
PZ-H(I)	35.69	23.91	11.78
PZ-H(K)	32.18	18.62	13.56
PZ-H(O)	38.34	26.17	12.17
PZ-I(E)	24.49	10.71	13.78
PZ-J(I)	38.26	25.82	12.76
PZ-J(O)	33.95	16.69	17.26

MONITORING WELLS

WELL NO.	MEASURING POINT ELEVATION	DEPTH TO WATER	GROUND WATER ELEVATION
3	20.30	13.72	6.53
7W	20.97	13.56	7.31
13	23.78	16.81	6.89
14-87	23.61	16.55	7.06
14B	21.82	10.03	11.80
16-87	23.67	19.65	4.02
16H	22.04	14.63	7.41
16S	21.70	ABANDONED	
100-87	28.05	14.85	13.20
101-87	24.36	11.82	12.54
102-87	23.19	18.32	4.87
103-87	21.26	17.64	3.62
103B	21.18	9.60	11.58
104	23.16	17.13	6.02
105	18.48	13.72	4.76
106	24.33	18.02	6.24
200M	ABANDONED		
201M	ABANDONED		
203M	ABANDONED		
204M	ABANDONED		
2025	ABANDONED		
203M	ABANDONED		
2035	ABANDONED		
2046	22.45	7.77	14.68
204M	20.68	6.55	13.71
2045	19.84	5.04	14.80

WELL NO.	MEASURING POINT ELEVATION	DEPTH TO WATER	GROUND WATER ELEVATION
205S			ABANDONED
205M			ABANDONED
206S	21.83	9.89	11.74
206M	20.07	8.91	11.16
207S	24.01	6.36	17.65
208M	21.90	8.68	13.22
209S	21.82	6.68	14.74
210	24.65	15.99	8.76
300M	23.13	13.84	9.19
301M	21.08	10.16	10.63
302M	21.01	9.80	11.41
303M	25.04	10.38	14.26
304M	22.22	15.10	7.12
306M	24.13	DRY	--
311M	33.17	18.80	6.37
312M	25.98	18.90	8.08
313M	27.54	13.74	8.80
315M	18.16	ABANDONED	
317M	25.71	14.11	8.60
318	23.31	--	--
319S	23.75	ABANDONED	
320	19.86	--	--
323S	23.43	DESTROYED	
340	18.84	DESTROYED	
341M	19.23	9.91	8.32
341B	19.47	6.88	12.59
342M	20.69	11.00	9.69
342B	20.16	7.87	12.81

INFERRED GROUNDWATER CONTOURS 10/01/03 - 10/08/03

SCALE: 1"=200'

Figure 2
Water Quality Monitoring Site Plan

Hartford Landfill
180 Leibert Road
Hartford, Connecticut

SCALE: 1"=200'

0 1HEHES

SHEET

APPENDIX A - Permits

LF0000014 — **Discharge of Leachate to Ground Water**
(Dated February 6, 1998, with Modification Dated May 28, 2002)
23 Page Permit, plus 2 Page Modification

SP0001412 — **Pretreatment Permit for Discharges to the Sanitary Sewer**
(Dated October 17, 2007)
8 Page Permit

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

I CERTIFY THAT THIS DOCUMENT IS A TRUE COPY OF THE ORIGINAL.
Pamela DiBurney
NAME
Processing Technician
TITLE
DEPARTMENT OF ENVIRONMENTAL PROTECTION, BUREAU OF WATER MANAGEMENT

Connecticut Resources Recovery Authority
179 Allyn Street
Hartford, Connecticut 06103

Attention: Robert Wright
Acting President

Re: Facility ID: 064-072
City of Hartford
Connecticut River Watershed

This permit is issued in accordance with Section 22a-430 of Chapter 446k, Connecticut General Statutes, and regulations adopted thereunder, as amended.

Your applications for a permit submitted by Fuss & O'Neill, Inc. on November 2, 1988, October 1, 1990, and as revised through April 15, 1994 by Fuss & O'Neill and Wehran Engineering Corp ("the application"); supporting documents, addenda, letters and plates identified in Appendix A of this permit; and compliance monitoring plan approved by the Commissioner of Environmental Protection (hereinafter "the Commissioner") on January 26, 1998, have been reviewed by the Connecticut Department of Environmental Protection.

The Commissioner has found that the proposed system to treat the discharge to ground water of leachate from an existing 86-acre, unlined solid waste disposal area, a 17-acre, Phase I, lined ash residue disposal area, and a 15-acre, Phase II, lined ash residue disposal area, if the liner and collection system fails, ("the Hartford Landfill"), located on Liebert Road, Hartford, will protect the waters of the state from pollution. The proposed system includes the construction of a slurry wall and ground water flow control system for the existing unlined solid waste disposal area and the Phase I lined ash residue area.

The Commissioner, acting under Section 22a-430, hereby permits the Connecticut Resources Recovery Authority (hereinafter "the permittee") to discharge leachate from the 86-acre, unlined solid waste disposal area, and the 17-acre, Phase I, lined ash residue disposal area of the Hartford Landfill at Liebert Road, Hartford, Connecticut, to the ground waters of the state in accordance with the following conditions:

1) Discharge Serial No. 001

Description:	Leachate from Municipal Solid Waste and Municipal Solid Waste Ash Residue (Discharge code 305002e)
Discharge Location:	Ground waters in the watershed of the Connecticut River Basin Code 4000.

Disposal Area Design Size: 86 acres, unlined, municipal solid waste
32 acres, lined, municipal solid waste ash residue

2) The Hartford Landfill shall be operated and maintained in accordance with the permit to operate a solid waste disposal area No. 064-4(L) permit modification issued on November 8, 1996, and additional supporting documents as approved.

3) The surface and groundwaters shall be monitored as follows:

(A) Surface Water Quality Monitoring

(i) Locations - Surface water quality monitoring shall be conducted at the following locations as shown on Figure 2, entitled "Compliance Monitoring Location Plan, CRRA - Hartford Landfill, July 1997 Environmental Monitoring Event, Leibert Road, Hartford, Connecticut", prepared by HRP Associates, and approved by the Commissioner on January 26, 1998.

(a) Connecticut River Transects: Three monitoring locations shall be established on each transect. Monitoring locations shall be located approximately 50 feet apart along a line extending from the western bank of the river perpendicular to the direction of flow, with the westernmost location approximately 50 feet from the western shoreline.

Transect T-1, 1200 feet upstream of confluence with Meadow Brook

Locations: S-1W
S-1C
S-1E

Transect T-2, adjacent to location of monitoring well MW-101

Locations: S-2W
S-2C
S-2E

Transect T-3, adjacent to location of monitoring well MW-104

Locations: S-3W
S-3C
S-3E

(b) Meadow Brook Transects: One monitoring location shall be established on each transect. Monitoring locations shall be established near the center of the flow channel.

Transect T-4, adjacent to monitoring well MW-307

Location: S-4

Transect T-5, adjacent to monitoring well MW-341

Location: S-5

Transect T-6, mouth of Meadow Brook

Location: S-6

(c) Deckers Brook Transect: One monitoring location shall be established on each transect. Monitoring locations shall be established near the center of the flow channel.

Transect T-7, mouth of Deckers Brook

Location: S-7

(ii) Sampling Procedures --

(a) All samples shall be collected from each surface water monitoring location in accordance with the plan entitled "Compliance Monitoring Plan, Hartford Landfill", received on December 10, 1997 and revisions received on December 18, 1997, January 6, 1998 and January 23, 1998, and prepared by CRRA and approved by the Commissioner on January 26, 1998.

A discrete grab sample shall be collected at each monitoring location at a depth of one foot below the water surface, at one foot above the bottom sediment, and at mid-depth.

For water depths between three and four feet, two grab samples shall be collected: one at one foot below water surface, and one foot above bottom sediments. For water depths of less than three feet, one grab sample shall be collected at mid-depth.

(b) Grab samples collected at monitoring locations in Transects T-1, T-2 and T-3 listed in paragraph 3(A)(i)(a) above shall be composited prior to analysis as follows:

For monitoring locations established on Transect T-1 and T-3, a vertical composite sample shall be prepared at each monitoring location combining equal volumes of the near

surface, near bottom, and mid-depth grab samples.

For monitoring locations established on Transect T-2, three horizontal composite samples (near surface, near bottom, and mid-depth) shall be prepared by combining equal volumes of all samples collected at similar water depths at monitoring locations S2-W, S2-C, and S2-E.

(c) Grab samples collected at monitoring locations in Transects T-4, T-5, T-6 and T-7 as listed in paragraph 3(A)(i)(b) and 3(A)(i)(c) above shall be composited by combining equal volumes to result in a single vertical composite sample made of the one to three grab samples.

(d) Temperature (00011), pH (00400-012), Specific Conductance (0095-104), dissolved oxygen (00300-019), sample depth, and depth to bottom shall be measured at each sampling location at the time samples are collected in accordance with the schedules required by paragraph 3(A)(iv) or as required by paragraph (E)(vi). Stream flows (00061) shall also be determined at monitoring locations S-6 and S-7 by direct measurement or estimation and for the Connecticut River by gauge reports from the United States Geological Survey. Results shall be reported together with the results of analyses of the samples in accordance with paragraph 3(D).

(iii) Parameters -

(a)

	Parameter	Code No.	EPA Method:Minimum Level
1.	Total Dissolved Solids	(70295-019)	160.1
2.	Total Suspended Solids	(00530-019)	160.2
3.	BOD (5-day)	(00310-019)	405.1
4.	Specific Conductance	(00095-104)	120.1
5.	Chloride	(00940-019)	325.x
6.	Hardness (as $CaCO_3$)	(00900-019)	130.1 or 130.2
7.	pH	(00400-012)	150.1
8.	Ammonia (as N)	(00610-019)	350.2: 100 ppb
9.	Nitrate (as N)	(00620-019)	352.1
10.	Nitrite (as N)	(00615-028)	354.1
11.	Cadmium (Total)	(01027-028)	213.2: 0.5 ppb
12.	Copper (Total)	(01042-028)	220.2: 5 ppb
13.	Copper (Dissolved)	(01040-028)	220.2: 5 ppb
14.	Iron (Total)	(01045-019)	236.2: 5 ppb
15.	Lead (Total)	(01051-028)	239.2: 5 ppb

16.	Lead (Dissolved)	(01049-028)	239.2: 5 ppb
17.	Silver (Total)	(01077-028)	272.2: 1 ppb
18.	Zinc (Total)	(01092-028)	289.2: 10 ppb
19.	Zinc (Dissolved)	(01090-028)	289.2: 10 ppb
20.	Alkalinity	(00410-019)	310.1
21.	COD	(00341-019)	410.x
22.	Sulfate (Total)	(00945-019)	375.x
23.	Orthophosphorus, (Total)	(70507-019)	365.3
24.	Antimony (Total)	(01097-028)	204.2: 10 ppb
25.	Arsenic (Total)	(01002-028)	206.2: 5 ppb
26.	Barium (Total)	(01007-028)	208.2: 10 ppb
27.	Beryllium (Total)	(01012-028)	210.2: 1 ppb
28.	Chromium (Total)	(01034-028)	218.2: 5 ppb
29.	Chromium (Hexavalent)	(01032-028)	218.5: 5 ppb
30.	Cobalt (Total)	(01037-028)	219.2: 5 ppb
31.	Manganese (Total)	(01056-019)	243.2: 1 ppb
32.	Mercury (Total)	(71900-028)	245.1: 0.2 ppb
33.	Nickel (Total)	(01067-028)	249.2: 5 ppb
34.	Selenium (Total)	(01147-028)	270.2: 5 ppb
35.	Thallium (Total)	(01059-028)	279.2: 10 ppb
36.	Vanadium (Total)	(01087-028)	286.2: 10 ppb

x = Any method may be used.

(b) Parameters shall be analyzed in accordance with the specifications of paragraph 3(E) of this permit. Alternative analytical methods which have been approved by the U.S. Environmental Protection Agency in accordance with 40 CFR 136 may be substituted for the methods identified above provided the analysis of these parameters includes appropriate calibration points or check standards which demonstrate that these alternative methods are capable of quantification of the parameter at the concentration present in the sample without sample concentration.

(iv) Schedule --

(a) Surface water quality monitoring locations identified in paragraph 3(A)(i)(a) shall be sampled quarterly during the months of January, April, July, and October.

(b) Surface water quality monitoring locations identified in paragraphs 3(A)(i)(b) and 3(A)(i)(c) shall be sampled quarterly during the months of January, April, July, and October. The frequency of sampling shall be monthly beginning on or before the third year after issuance of this permit, or one year prior to the construction of the ground water flow

control system for phase II of the lined ash residue landfill, whichever is earlier.

(c) Surface water quality monitoring samples collected during the months of January, April, July and October shall be analyzed for the parameters listed in paragraph 3(A)(iii), items 1 through 36 inclusive.

(d) Surface water quality monitoring samples collected during the months of February, March, May, June, August, September, November, and December shall be analyzed for the parameters listed in paragraph 3(A)(iii), items 1 through 19 inclusive.

(B) Ground Water Quality Monitoring

(i) Locations - Ground water quality monitoring shall be conducted at the following locations as shown on Figure 2, entitled "Compliance Monitoring Location Plan, CRRA - Hartford Landfill, July 1997 Environmental Monitoring Event, Leibert Road, Hartford, Connecticut", prepared by HRP Associates, received by the Department on December 10, 1997, and approved by the Commissioner on January 26, 1998.

(a) Compliance Monitoring Wells:

C- 1:MW-340	
C- 2:MW-341M	
C- 3:MW-341B	Proposed bedrock monitoring well
C- 4:MW-342M	
C- 5:MW-342B	Proposed bedrock monitoring well
C- 6:MW-14B	
C- 7:MW-103B	Proposed bedrock well SE of existing landfill
C- 8:MW-7B	Proposed bedrock monitoring well on Southeast corner of existing landfill
C- 9:PZ-AI	Piezometer South of existing landfill
C-10:PZ-AE	Piezometer South of existing landfill
C-11:PZ-BI	Piezometer South of existing landfill
C-12:PZ-BE	Piezometer South of existing landfill
C-13:PZ-CI	Piezometer South of existing landfill
C-14:PZ-CE	Piezometer South of existing landfill
C-15:PZ-DI	Piezometer West of existing landfill
C-16:PZ-DE	Piezometer West of existing landfill
C-17:PZ-EI	Piezometer West of existing landfill
C-18:PZ-EE	Piezometer West of existing landfill
C-19:PZ-FI	Piezometer West of existing landfill
C-20:PZ-FE	Piezometer West of existing landfill
C-21:PZ-GI	Piezometer West of proposed landfill, Phase I

C-22:PZ-GE	Piezometer West of proposed landfill, Phase I
C-23:PZ-HI	Piezometer West of proposed landfill, Phase I
C-24:PZ-HE	Piezometer West of proposed landfill, Phase I
C-25:PZ-II	Piezometer North of proposed landfill, Phase I
C-26:PZ-IE	Piezometer North of proposed landfill, Phase I
C-27:PZ-JI	Piezometer North of proposed landfill, Phase I
C-28:PZ-JE	Piezometer North of proposed landfill, Phase I

(b) Plume Characterization Wells:

W- 1:MW-307M
W- 2:MW-16S
W- 3:MW-16M
W- 4:MW-308M
W- 5:MW-309M
W- 6:MW-15-87
W- 7:MW-14-87
W- 8:MW-311M
W- 9:MW-13
W-10:MW-106
W-11:MW-101
W-12:MW-102
W-13:MW-103
W-14:PZ-AI (also C-9)
W-15:MW-312
W-16:MW-210
W-17:MW-7

(c) The following wells have also been designated as Surface Water Protection Wells:

C- 1:MW-340
W- 1:MW-307M
W- 2:MW-16S
W- 4:MW-308M
W- 5:MW-309M
W- 7:MW-14-87
W- 8:MW-311M
W- 9:MW-13
W-10:MW-106
W-11:MW-101
W-12:MW-102
W-13:MW-103
SW-1:MW-104
SW-2:PZ-AE (also C-10)

(d) The following well has been designated as a dedicated dioxin sampling well:

D-1:MW-DX (stainless steel well located approximately 5 feet from MW-106)

(ii) Parameters -

	Parameter	Code No.	EPA Method : Minimum Level
1.	Total Dissolved Solids	(70295-019)	160.1
2.	Total Suspended Solids	(00530-019)	160.2
3.	Alkalinity	(00410-019)	310.1
4.	COD	(00341-019)	410.x
5.	Iron (Total)	(01045-019)	236.2: 5 ppb
6.	Manganese (Total)	(01056-019)	243.2: 1 ppb
7.	Specific Conductance	(00095-104)	120.1
8.	Nitrate (as N)	(00620-019)	352.1
9.	Chloride	(00940-019)	325.x
10.	Hardness (as $CaCO_3$)	(00900-019)	130.1 or 130.2
11.	pH	(00400-012)	150.1
12.	Ammonia (as N)	(00610-019)	350.2: 100 ppb
13.	Sodium	(00929-019)	
14.	Potassium	(00937-019)	
15.	All inorganics identified in Appendix I of 40 CFR Part 258 of the Federal Register, Vol. 56, No. 196, October 9, 1991, beginning page 51032 using EPA method 6010.		
16.	Volatile Organic Compounds identified in Appendix I of 40 CFR Part 258 of the Federal Register, Vol. 56, No. 196, October 9, 1991, beginning page 51032 using EPA method 8260		
17.	Beginning the first quarter after the Commissioner's approval of the report required under paragraph 3(C)(iv), any supplemental parameters identified in accordance with the requirements of paragraph 3(C).		
18.	Dioxin and Furans		

x = Any method may be used

(iii) Schedule for Ground Water Quality Monitoring - The ground water quality monitoring program shall begin the first scheduled quarterly sampling period after issuance of this permit. The permittee shall certify to the Commissioner that all monitoring wells, piezometers, dedicated sampling devices and associated appurtenances have been installed. Thereafter, with the exception of the piezometers identified in paragraph 3(B)(i)(a) as numbers C- 9 to C-28, the ground water quality monitoring locations in paragraph 3(B)(i) shall be conducted four times per year in accordance with the following schedule unless otherwise specified:

Sampling Periods

January
April
July
October

(a) Each ground water sample collected from the monitoring wells designated in paragraph 3(B)(i)(a) as C-2, C-3, C-4, C-5, C-6, C-7, and C-8 shall be analyzed for the parameters identified in paragraph 3(B)(ii), items 1 through 17.

(b) Each ground water sample collected from the monitoring wells designated in paragraph 3(B)(i)(b) as W-3, W-6, W-14 and W-17 shall be analyzed for the parameters listed in paragraph 3(B)(ii), items 1 through 16.

(c) Each ground water sample collected from the monitoring wells designated in paragraph 3(B)(i)(b) as W-15 and W-16 shall be analyzed for the parameters identified in Appendix II of 40 CFR Part 258 of the Federal Register, Vol. 56, No. 196, October 9, 1991, beginning page 51033, and the parameters listed in paragraph 3(B)(ii), items 1 through 14 for only two consecutive quarterly sampling periods beginning the first scheduled sampling period after issuance of the permit and ending after the second scheduled quarterly sampling period.

(d) Each ground water sample collected from the monitoring wells designated in paragraphs 3(B)(i)(a), and 3(B)(i)(c) as C-1 shall be analyzed for the parameters identified in paragraph 3(B)(ii), items 13, 14, 16 and 17, and the parameters identified in paragraph 3(A)(ii), items 1 through 36, with the exception of item 3.

(e) Each ground water sample collected from the monitoring wells designated in paragraphs 3(B)(i)(b), and 3(B)(i)(c) as W-1, W-2, W-4, W-5, W-7, W-8, W-9, W-10, W-11, W-12, W-13, SW-1, and SW-2, shall be analyzed for the parameters identified in paragraph 3(B)(ii), items 13, 14, and 16, and the parameters identified in paragraph 3(A)(ii), items 1 through 36, with the exception of item 3.

(f) Each groundwater sample collected from the monitoring well designated in paragraph 3(B)(i)(d) as D-1 should be analyzed on an annual basis during the July sampling event for the parameters in paragraph 3(B)(ii), item 18.

(iv) Schedule for Monitoring Piezometers - The ground water monitoring program for the piezometers shall begin 30 days after issuance of the permit. Piezometers identified in paragraph 3(B)(i)(a) as numbers C- 9 to C-28 shall be monitored for ground water

elevations on a monthly basis for a period of a minimum of twelve (12) months after notification in writing to the Commissioner that a state of equilibrium has been reached. Thereafter the monitoring frequency shall be quarterly in accordance with paragraph 3(B)(iii).

(v) Sampling Conditions - Water level elevation (C0137) shall be measured at all ground water monitoring locations in paragraph 3(B)(i) prior to each sample collection and shall be reported together with the results of analyses of the sample in accordance with paragraph 3(D).

The samples shall be collected from each ground water monitoring location in accordance with the plan entitled "Compliance Monitoring Plan, Hartford Landfill", dated December 1997, prepared by CRRA, received on December 10, 1997 and revisions received December 18, 1997, January 6, 1998 and January 23, 1998, and approved by the Commissioner on January 26, 1998.

(C) Supplemental Ground Water Quality Monitoring

(i) Location - Supplemental ground water quality monitoring shall be conducted at the following locations identified in paragraph 3(B)(i).

1. W- 10:MW-106
2. W- 11:MW-101
3. W- 12:MW-102
4. W- 13:MW-103
5. W- 17:MW-7
6. SW- 1:MW-104

(ii) Schedule - Supplemental ground water quality monitoring shall be conducted for two consecutive quarterly sampling periods beginning the first scheduled quarterly sampling period after permit issuance and ending after the second scheduled quarterly sampling period.

(iii) Parameters - Samples collected for supplemental monitoring shall be analyzed for the compounds identified in Appendix II of 40 CFR Part 258 of the Federal Register, Vol. 56, No. 196, October 9, 1991, beginning page 51033.

(iv) Subsequent supplemental monitoring - On or before sixty (60) days after the second supplemental ground water quality monitoring event, the permittee shall submit for the review and approval of the Commissioner a report describing the results of monitoring in conformance with Appendix II of CFR Part 258 of the Federal Register, Vol. 56, No. 196, October 9, 1991 required by this paragraph, and a plan for amending the ground water quality monitoring parameters at the compliance monitoring wells C-1 to C-8 identified in paragraph 3(B)(i)(a), and schedule listed in paragraphs 3(B)(iii)(a) and 3(B)(iii)(d) to include Appendix II compounds detected.

(v) Sampling conditions - The samples shall be collected from each ground water monitoring location identified in paragraph 3(C)(i) in accordance with the plan entitled "Compliance Monitoring Plan, Hartford Landfill", received on December 10, 1997 and revisions received on December 18, 1997, January 6, 1998 and January 23, 1998, prepared by CRRA, and approved by the Commissioner on January 26, 1998.

(D) Reporting

(i) The results of all sampling and analyses required by this permit, unless otherwise specified in writing by the Commissioner, shall be reported in accordance with the following schedule:

Reporting Dates

March 15
June 15
September 15
December 15

(ii) The results of all analyses and measurements required by this permit shall, unless otherwise specified in writing by the Commissioner, be reported by the Permittee to both the Bureau of Waste Management and the Bureau of Water Management (Attention: Landfill Monitoring Coordinator) of the Department of Environmental Protection at 79 Elm Street, Hartford, Connecticut 06106-5127. An additional copy of each report shall be submitted by the Permittee to the Aquatic Toxicology section of the Water Management Bureau.

(iii) The results of all analyses and measurements required by this permit shall also be reported to the Health Officer of the City of Hartford.

(E) Sample Analysis

(i) All sample analyses required by this permit shall be performed by a laboratory certified for such analyses by the Connecticut Department of Public Health and Addiction Services or in advance of any use, a laboratory approved in writing by the Commissioner.

(ii) Analytical results for each parameter shall be reported together with their method detection limits. The value of each parameter shall be reported to the maximum level of accuracy and precision possible. Failure to submit data in accordance with the procedures and protocols set forth in this permit shall constitute a permit violation.

(iii) Analyses required by paragraphs 3(A), 3(B), 5 and 6 shall be performed using

the methods specified unless an alternative method has been specifically approved in writing by the Commissioner for monitoring at this facility. Failure to use the analytical method specified or approved by the Commissioner shall constitute a permit violation.

(iv) Monitoring required by paragraphs 3(A) and 3(B) which specify the use of analytical methods in paragraph 3(A)(iii)(a) must be conducted to achieve the minimum levels for each of the parameters, where identified, unless an alternative method that is capable of achieving the minimum levels has been specifically approved in writing by the Commissioner.

(v) The minimum levels specified in paragraph 3(A)(iii)(a) represent the concentration at which quantification must be achieved and verified during the chemical analyses for these compounds. Analyses for these compounds must include calibration points at least as low as the specified minimum level. Check standards within ten percent of the specified minimum level may be used in lieu of a calibration point equal to the minimum level.

(vi) If any sample analysis indicates that quantification for a particular parameter can not be verified at or below the specified minimum level, a second sample shall be collected and analyzed for that parameter according to the above specified methodology as soon as practicable but no later than thirty (30) days following collection of the sample for which the quantification at or below the minimum level was not verified. The results of the first and subsequent sample analyses shall be submitted to the Commissioner verifying that the appropriate methodology was employed, the minimum level was achieved for quality-control samples and that failure to quantify the parameter at or below the minimum level specified for the analysis was a result of matrix effects which could not be compensated for as part of sample analysis allowed pursuant to 40 CFR Part 136.

(vii) If any three (3) samples collected in a twelve-month period indicate that the specified minimum level was not achieved for a particular parameter when using the specified test methodology, the permittee shall submit a report for the review and approval of the Commissioner which justifies and defines the matrix effect upon analyses for that parameter, identifies the level at which quantification can be verified and recommends modification to the method or an alternative method that is sufficiently sensitive and free of the identified matrix effect.

4. Zone of Influence Compliance Monitoring - The Permittee shall operate and maintain a ground water flow control system in accordance with the compliance monitoring plan entitled "Compliance Monitoring Plan, Hartford Landfill", received on December 10, 1997 and revisions received on December 18, 1997, January 6, 1998 and January 23, 1998, prepared by CRRA, and approved by the Commissioner on January 26, 1998. The Permittee

shall follow the requirements of this section to determine whether the discharge of leachate has exceeded the boundaries of the permitted zone of influence. All sampling shall be conducted in accordance with the compliance monitoring plan.

(A) Background Data Base and Piezometer Monitoring -

(i) Background Data Base - The compliance ground water quality monitoring wells identified in paragraph 3(B)(i)(a) of this permit shall be sampled no less than thirty (30) day intervals for twelve months. Samples shall be analyzed for alkalinity, hardness, ammonia, chlorides, iron, manganese, sodium, potassium, and total dissolved solids. The results of all sampling and analyses during this twelve month period shall be reported in accordance with paragraph 3(D) of this permit. No later than 60 days after the collection of the final sample, a report shall be submitted for the review and approval of the Commissioner describing the results of all sampling and analyses performed required by this paragraph, proposing maximum background levels for all nine parameters, and recommending selection of at least four parameters for the zone of influence compliance monitoring program. These selected parameters will be designated as compliance parameters. The maximum background level is defined as the maximum measured concentration of each compliance parameter at each compliance well during the twelve month monitoring period.

(ii) Piezometer Monitoring - No later than 30 days after permit issuance, the permittee shall submit for the Commissioner's review and written approval a report describing the performance of the ground water flow control system, the difference in ground water elevations measured at each piezometer pair, and proposing the recommended minimum differential of ground water elevations at each piezometer pair location and a schedule for attaining the minimum differential. The minimum differential is defined as the minimum difference in ground water elevations established at each piezometer pair between the inside and outside of the ground water flow control system to assure that the zone of influence will not extend beyond the possession of the permittee.

(B) Exceedance -

(i) Any analytical result from any sample obtained from the compliance wells for each of the four compliance parameters which exceeds the maximum background level for that parameter as defined in paragraph 4(A)(i) shall constitute an exceedance.

(ii) Ground water elevations which are not maintained at the minimum differential at any piezometer pair as defined in paragraph 4(A)(ii) shall constitute an exceedance.

(C) Confirmed Exceedance -

(i) Any well for which an exceedance occurs shall be resampled within forty-five (45) days of the sampling event which established the exceedance and shall be analyzed for the parameter(s) causing the exceedance. If the second result is found to exceed the maximum background level for the same parameter(s), such result will constitute a confirmed exceedance. If the second for the parameter(s) causing an exceedance does not exceed the maximum background level for that parameter, the zone of influence compliance monitoring program shall resume its normal quarterly schedule. If the next quarterly sampling result is found to exceed the maximum background level for the same parameter(s) at the same compliance well, such result will constitute a confirmed exceedance. The permittee shall assure that the results of all sampling necessary to confirm an exceedance is received from the laboratory no more than 30 days from the date of sample collection.

(ii) Any piezometer pair for which an exceedance occurs shall be resampled within fourteen (14) days of the sampling event which established the exceedance. If the second result is found not meeting the minimum differential, such result shall constitute a confirmed exceedance. If the second result is found to meet the minimum differential, the monitoring program shall resume its normal monitoring schedule. If the next monthly sampling result is found not meeting the minimum differential, such result shall constitute a confirmed exceedance.

(D) Within 7 days of becoming aware of an occurrence of a confirmed exceedance as defined in paragraph 4(C), the permittee shall notify the Commissioner in writing and within 60 days shall submit a report for the Commissioner's review and approval which explains the source and cause of the confirmed exceedance and provides a description of any extenuating circumstances and recommends steps to be taken to prevent such exceedances from recurring.

5. On a monthly basis the permittee shall conduct an inspection of the perimeter and side slopes of the existing 86-acre, unlined solid waste disposal area, and the 17-acre, Phase I ash residue disposal area ("the landfills"), the banks of surface waters, and the wetlands adjacent to the landfills to identify the presence of any leachate seeps or iron oxide precipitation. All persistent leachate seeps identified shall be sampled and analyzed for the parameters identified in paragraph 3(B)(ii), items 1 through 16. Persistent leachate seeps are defined as active discharges which have been identified at any one location in three consecutive inspection periods. The permittee shall, in accordance with the reporting schedule in paragraph 3(D) submit for the review and approval of the Commissioner a report which includes a map drawn to a scale of one inch equal to 200 feet showing the presence and location of all leachate seeps or iron oxide precipitation, describes their chemical composition, any sampling results, and the discharge rate, and which includes a plan for the

remediation of such seeps or iron oxide precipitation and a schedule for carrying out the remediation plan. The permittee shall conduct the remediation plan in accordance with the schedule approved by the Commissioner in writing.

6. In 1998, 2000, and 2002, during the months of July and August, a habitat assessment shall be conducted in accordance with the surface water and ground water monitoring plan entitled "Compliance Monitoring Plan, Hartford Landfill", received on December 10, 1997 and revisions received on December 18, 1997, January 6, 1998 and January 23, 1998, prepared by CRRA, and approved by the Commissioner on January 26, 1998. The habitat assessment shall include but not be limited to the following: at each surface water monitoring location identified in paragraph 3(A)(i), a description of physical characteristics and water quality; chemical analyses of sediment samples collected; and a survey of stream bank and submerged aquatic vegetation in and along that portion of Meadow Brook east of the railroad right of way, and a schedule for reporting the results of such assessment to the Commissioner. Sediment samples shall be analyzed for the following parameters:

    Arsenic (Total)
    Cadmium (Total)
    Chromium (Total)
    Copper (Total)
    Iron (Total)
    Lead (Total)
    Mercury (Total)
    Nickel (Total)
    Silver (Total)
    Zinc (Total)
    Percent Moisture
    Particle Size
    Total Organic Carbon
    Total Polyaromatic Hydrocarbons
    Total Polychlorinated Biphenyls
    Acid Volatile Sulfides

    Metals, with the exception of mercury, shall be analyzed using graphite furnace atomic absorption spectrophotometry. Mercury shall be analyzed using the cold vapor method.

    Report shall be submitted to the Aquatic Toxicity section of the Bureau of Water Management of the Department of Environmental Protection.

7. On or before January 1, 1999 and annually thereafter, a summary report of the monitoring and inspection program required by this permit shall be submitted for the Commissioner's review and written approval. The report shall include but not be limited to a) a map depicting all ground water and surface water monitoring locations, ground water withdrawal locations, and the locations of the collection, treatment, and conveyance of stormwater, leachate, and gas condensate; b) an evaluation of surface water and ground water quality,

and leachate quality and quantity, including graphical representation(s) of monitoring results; c) the condition of all monitoring wells and the need for repair or replacement of any wells; d) an evaluation of the extent and potential extent of the leachate discharge to ground water and whether any impact on the surface water quality of the Connecticut River, Meadow Brook or any other surface waters was detected or could reasonably be expected to occur; and e) an evaluation of the performance of the ground water flow control system and its ability to maintain possession of the zone of influence. The second annual report shall specifically include a summary of all surface and ground water monitoring results to date. The permittee may submit a written request for the Commissioner's review and approval a modification of the surface water and ground water quality monitoring program as warranted by the data collected and reported pursuant to the requirements of this permit.

8. For ground water, the zone of influence of the discharge from the Hartford Landfill, which is hereby permitted, shall not extend beyond property owned by the permittee or onto property whereby the right of possession of the zone of influence was not acquired by easement as approved by the Commissioner. The instrument establishing any easement shall, at a minimum, provide the following: (i) the permittee has the right to discharge pollutants to the ground water within the zone of influence; (ii) the permittee has the exclusive right to withdraw ground water from within the zone of influence; and (iii) the Municipality has the right to access the area of easement for the purposes of characterizing, monitoring, and remediating the ground water within the zone of influence. All such instruments establishing the right of possession shall be recorded on the land records of the Municipality.

   The zone of influence of the discharge is defined as the area of soil and ground water within which the treatment of the leachate discharge by soils and mixing of leachate with ground water occurs and could reasonably be expected to occur and, therefore, within which some degradation of ground water quality is anticipated to occur.

The permittee shall pay the annual compliance determination fee as set forth in the Regulations of Connecticut State Agencies including but not limited to Section 22a-430-7.

This permit is issued under Section 22a-430 of the Connecticut General Statutes and shall expire on February 6, 2028 .

The Commissioner reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under federal or state law. This permit as modified or reissued under this paragraph may also contain any other requirements of federal or state law then applicable.

This permit shall be subject to the following sections of the Regulations of Connecticut State

Agencies which are hereby incorporated into this permit:

Section 22a-430-3 General Conditions

(a)Definitions
(b)General
(c)Inspection and Entry
(d)Effect of a Permit
(e)Duty
(f)Proper Operation and Maintenance
(g)Sludge Disposal
(h)Duty to Mitigate
(i)Facility Modifications; Notification
(j)Monitoring, Records and Reporting Requirements
(k)Bypass
(l)Conditions Applicable to POTWs
(m)Effluent Limitation Violations (Upsets)
(n)Enforcement
(o)Resource Conservation
(p)Spill Prevention and Control
(q)Instrumentation, Alarms, Flow Recorders
(r)Equalization

22a-430-4 Procedures and Criteria

(a)Duty to Apply
(b)Duty to Reapply
(c)Application Requirements
(d)Preliminary Review
(e)Tentative Determination
(f)Draft Permits, Fact Sheets
(g)Public Notice, Notice of Hearing
(h)Public Comments
(i)Final Determination
(j)Public Hearings
(k)Submission of Plans and Specifications. Approval.
(l)Establishing Effluent Limitations and Conditions
(m)Case by Case Determinations
(n)Permit issuance or renewal
(o)Permit Transfer
(p)Permit revocation, denial or modification
(q)Variances
(r)Secondary Treatment Requirements
(s)Treatment Requirements for Metals and Cyanide
(t)Discharges to POTWs - Prohibitions

Your attention is especially drawn to the notification requirements of subsection (i)(2), (i)(3), (j)(6), (j)(9)(C), (j)(11)(C), (D), (E), and (F), (k)(3) and (4) and (l)(2) of Section 22a-430-3.

Entered as a Permit of the Commissioner of the Department of Environmental Protection on the 6th day of February, 1998.

Arthur J. Rocque, Jr.
Commissioner

PAMS Application No. 19950983
Application Nos. 88-357 & 90-496

Permit No. LF0000014

APPENDIX A

The Application

Proof of Publication provided by the Hartford Courant dated March 10, 1994, APP EX 1.

Application Summary Supplement Regarding the Permit Application Documents for the Proposed North Meadows Ash Landfill Expansion at the Hartford Landfill and DEP Comments. Dated March, 1994, revised to April 13, 1994 (Wehran Engineering Corporation, 3" 3-Ring Binder), APP EX 2.

Exhibit B: Development\Design Report Ash Monocells and Revised Operational and Management Plan. Dated May 1987, Rev. August, 1990 and August, 1993 (F&O, 20 pg - Bound), APP EX 4.

Exhibit C: Ash Leachate Treatability Review for CRRA for the Hartford Landfill Ash Residue Disposal Facility, Dated August, 1990, Rev. June 1993 (F&O, 1" - Bound), APP EX 5.

Exhibit D: Hydrogeological Investigation of the Hartford Landfill and Proposed Residue Disposal Site, Dated July 1990, as Ex. f, Rev. September, 1993 (F&O, 4" 3-Ring Binder), APP EX 6.

Exhibit F: SPDES Application for the Discharge of Leachate from the Existing and Proposed Landfill to Groundwater for Discharge to the MDC Sewer System, Hartford Landfill (Wehran, 1" - bound), APP EX 8.

Exhibit G(1): Stormwater Pollution Prevention Plan Hartford Landfill, Liebert Road, Hartford, CT Dated August, 1990 as NPDES Application, Rev. Aug. 1993, Rev. March, 1994 (Anchor, ½" - bound), APP EX 9.

Exhibit G(2): Stormwater Drainage and Design Computations - Hartford Landfill Phase 1 and 2, Liebert Road, Hartford, CT, Proposed Horizontal Expansion, Dated November, 1989 Stormwater Management Plan Ex. J., Rev. August 1993 (F&O 1" - bound), APP EX 10.

Exhibit I: Proposed Horizontal Expansion, Phase I and Phase II Hartford Landfill Drawings Dated June, 1990 as Ex. H Rev. August, 1993 (F&O, 21 - 30"x42" Sheets), APP EX 12.

Potentiometric Surface Contour Maps, 1":100' scale plans dated April, 1994 (F&O, 4 plates, 4A-4D), APP EX 13.

Groundwater Reclassification Request, Letter to Robert Smith (DEP) from Christopher Recchia (CRRA), dated March 18, 1994 (CRRA, 6 pages), APP EX 14.

1989 Annual Groundwater Summary for the Hartford Landfill by F&O, dated June, 1990, APP EX 18.

1990 Annual Groundwater Summary for the Hartford Landfill by F&O, dated June, 1991, APP EX 19.

1991 Annual Groundwater Summary for the Hartford Landfill by F&O, dated May, 1992, APP EX 20.

1992 Annual Groundwater Summary for the Hartford Landfill by F&O, dated May, 1993, APP EX 21.

NPDES (Sic SPDES) Permit Application for the Mid-Connecticut [Hartford] Landfill by F&O, dated October, 1988, APP EX 22a.

Reapplication for Permit DEP/WPC 064-072 for the Mid-Connecticut [Hartford] Landfill by F&O, dated March, 1989, APP EX 22b.

Supplement to the Discharge Permit Reapplication for the Mid-Connecticut Project [Hartford Landfill] by F&O, dated July, 1990, APP EX 22c.

Hydrogeologic Investigation for the Proposed Residue Disposal Site by F&O, dated July 1990, APP EX 23a.

Hydrogeologic Investigation for the Proposed Residue Disposal Site by F&O, dated July 1990. Appendices A-P, Plates 1-8, APP EX 23b.

Additional Submittals

Lease Agreement Amendment with the City of Hartford, dated December 29, 1995, includes drawings "Survey Showing Land Leased by CRRA ... Sheets 1& 2" by Fuss & O'Neill, revised November 21, 1995.

Letter from CRRA to CTDEP, Re: Amendment to Lease Agreement with City of Hartford, Hartford Landfill, dated June 18, 1997.

"Project Manual Contract Documents for Hartford Landfill - Groundwater Flow Control System, CRRA Contract No. 974120" prepared by EMCON for CRRA, dated February 14, 1997.

Incorporates the following documents:

"Technical Specification, Groundwater Collection and Pumping System at the Hartford Landfill" prepared by EMCON for CRRA, dated October 1996 with cover letter dated November 15, 1996.

"Operations and Maintenance Plan for the Groundwater Collection and Pumping System - Hartford Landfill - Hartford, Connecticut" prepared by EMCON for CRRA dated December 3, 1996.

"Engineering Design Report for the Groundwater Collection and Pumping System - Hartford Landfill - Hartford, Connecticut" prepared by EMCON for CRRA dated December 3, 1996.

"Connecticut Resource Recovery Authority, Hartford Landfill, Construction Plans for the Groundwater Collection System" prepared by EMCON, dated November 1996, revised January 1997.

"Project Manual Contract Documents for Hartford Landfill - Groundwater Collection and Pumping System, CRRA Contract No. 974117" prepared by EMCON for CRRA, dated January 30, 1997.

"Connecticut Resources Recovery Authority, Hartford Landfill, Preliminary Design Plans for the Groundwater Flow Control System" prepared by EMCON for CRRA, dated February 1997.

Operations and Maintenance Plan Revisions - Mixed Waste Landfill, dated December 16, 1996, includes Closure of Interim Ash Area and Program of Leachate Outbreaks & Seeps, dated November 1996.

Incorporates the following document:

"Summary of Proposed Program and Past Practices Associated with Inspections, Monitoring and Control of Leachate Outbreaks and Seeps at the Hartford Landfill"[2] prepared by CRRA, dated November 1996.

Letter from Jim Law, Dept. of the Army, New England Division, Corps of Engineers, to Frank Venile, Greater Hartford Flood Control Commission, dated March 13, 1997.

Letter from CRRA to CTDEP, Re: Groundwater Flow Control System, dated March 27, 1997. (Revision to "Project Manual Contract Documents for Hartford Landfill - Groundwater Collection and Pumping System, CRRA Contract No. 974120" dated February 14, 1997.)

Letter from CRRA to CTDEP Re: Groundwater Flow Control System, Hartford Landfill, supplemental Information to letter dated March 27, 1997, dated April 24, 1997. (Revision to "Project Manual Contract Documents for Hartford Landfill - Groundwater Collection and Pumping System, CRRA Contract No. 974120" dated February 14, 1997.)

"Cutoff Wall - Site Plan, Groundwater Flow Control System, Hartford Landfill, Connecticut Resources Recovery Authority, Hartford, Connecticut" prepared by Woodward-Clyde Consultants, dated May 2, 1997. (Revision to "Project Manual Contract Documents for Hartford Landfill - Groundwater Collection and Pumping System, CRRA Contract No. 974120" dated February 14, 1997.)

"Construction Certification Report - Groundwater Flow Control System (including slurry wall) - Hartford Landfill", Volumes 1 and 2, prepared by EMCON for CRRA, dated November 1997.

Includes the following document as Appendix I of Volume 1:

"72 Hour Aquifer Pump Test, Groundwater Flow Modeling and Groundwater Control Alternatives for the Hartford Landfill" by Environmental Risk Limited dated November 1997.

"Addendum to the Operations and Maintenance Plan - Groundwater Control System - Hartford Landfill" Environmental Risk Limited dated November 1997. (Also located in Appendix F of letter dated November 24, 1997.

Letter from CRRA to Oswald Inglese, CTDEP, Re: Renewal of Groundwater Discharge Permit No. LF0000014, Hartford Landfill (Groundwater Flow Control System (GFCS)), dated November 24, 1997.

"Compliance Monitoring Plan, Hartford Landfill", received Decmeber 10, 1997 and revisions received on December 18, 1997, January 6, 1998, and January 23, 1998 and prepared by CRRA.

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PRETREATMENT PERMIT

issued to

Connecticut Resources Recovery Authority (CRRA)
100 Constitution Plaza, 6th Floor
Hartford, CT 06103-1722

Location Address:
180 Leibert Road
Hartford

Facility ID: 064-072 **Permit ID:** SP0001412 **Permit Expires:** October [illegible]

SECTION 1: GENERAL PROVISIONS

(A) This permit is reissued in accordance with section 22a-430 of Chapter 446k, Connecticut General Statutes ("CGS"), and Regulations of Connecticut State Agencies ("RCSA") adopted thereunder, as amended, and a modified Memorandum of Agreement (MOA) dated June 3, 1981, by the Administrator of the United States Environmental Protection Agency which authorizes the State of Connecticut to administer a Pretreatment Program pursuant to 40 CFR Part 403.

(B) Connecticut Resources Recovery Authority (CRRA), ("Permittee"), shall comply with all conditions of this permit including the following sections of the RCSA which have been adopted pursuant to section 22a-430 of the CGS and are hereby incorporated into this permit. Your attention is especially drawn to the notification requirements of subsection (i)(2), (i)(3), (j)(1), (j)(6), (j)(8), (j)(9)(C), (j)(11)(C), (D), (E), and (F), (k)(3) and (4) and (l)(2) of section 22a-430-3.

Section 22a-430-3 General Conditions

(a) Definitions
(b) General
(c) Inspection and Entry
(d) Effect of a Permit
(e) Duty
(f) Proper Operation and Maintenance
(g) Sludge Disposal
(h) Duty to Mitigate
(i) Facility Modifications; Notification
(j) Monitoring, Records and Reporting Requirements
(k) Bypass
(l) Conditions Applicable to POTWs
(m) Effluent Limitation Violations (Upsets)
(n) Enforcement
(o) Resource Conservation
(p) Spill Prevention and Control
(q) Instrumentation, Alarms, Flow Recorders
(r) Equalization

Section 22a-430-4 Procedures and Criteria

(a) Duty to Apply
(b) Duty to Reapply
(c) Application Requirements
(d) Preliminary Review
(e) Tentative Determination
(f) Draft Permits, Fact Sheets
(g) Public Notice, Notice of Hearing
(h) Public Comments
(i) Final Determination
(j) Public Hearings
(k) Submission of Plans and Specifications. Approval.
(l) Establishing Effluent Limitations and Conditions

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(m) Case by Case Determinations
(n) Permit issuance or renewal
(o) Permit Transfer
(p) Permit revocation, denial or modification
(q) Variances
(r) Secondary Treatment Requirements
(s) Treatment Requirements for Metals and Cyanide
(t) Discharges to POTWs - Prohibitions

(C) Violations of any of the terms, conditions, or limitations contained in this permit may subject the Permittee to enforcement action, including but not limited to, seeking penalties, injunctions and/or forfeitures pursuant to applicable sections of the CGS and RCSA. Specifically, civil penalties of up to twenty-five thousand dollars may be assessed per violation per day.

(D) Any false statement in any information submitted pursuant to this permit may be punishable as a criminal offense under section 22a-438 or 22a-131a of the CGS or in accordance with section 22a-6, under section 53a-157b of the CGS.

(E) The authorization to discharge under this permit may not be transferred without prior written approval of the Commissioner of Environmental Protection ("the Commissioner"). To request such approval, the Permittee and proposed transferee shall register such proposed transfer with the Commissioner at least 30 days prior to the transferee becoming legally responsible for creating or maintaining any discharge which is the subject of the permit transfer. Failure by the transferee to obtain the Commissioner's approval prior to commencing such discharge(s) may subject the transferee to enforcement action for discharging without a permit pursuant to applicable sections of the CGS and RCSA.

(F) Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

(G) An annual fee shall be paid for each year this permit is in effect as set forth in section 22a-430-7 of the Regulations of Connecticut State Agencies.

SECTION 2: DEFINITIONS

(A) The definitions of the terms used in this permit shall be the same as the definitions contained in section 22a-423 of the CGS and section 22a-430-3(a) and 22a-430-6 of the RCSA.

(B) In addition to the above the following definitions shall apply to this permit:

"----" in the limits column on the monitoring table means a limit is not specified but a value must be reported on the DMR.

"Average Monthly Limit" means the maximum allowable "Average Monthly Concentration" as defined in section 22a-430-3(a) of the RCSA when expressed as a concentration (e.g. mg/l); otherwise, it means "Average Monthly Discharge Limitation" as defined in section 22a-430-3(a) of the RCSA.

"Daily Concentration" means the concentration of a substance as measured in a daily composite sample, or the arithmetic average of all grab sample results defining a grab sample average.

"Daily Quantity" means the quantity of waste generated during an operating day.

"Instantaneous Limit" means the highest allowable concentration of a substance as measured by a grab sample, or the highest allowable measurement of a parameter as obtained through instantaneous monitoring.

"Maximum Daily Limit" means the maximum allowable "Daily Concentration" (defined above) when expressed as a concentration (e.g. mg/l); otherwise, it means the maximum allowable "Daily Quantity" as defined above unless it is expressed as a flow quantity. If expressed as a flow quantity it means "Maximum Daily Flow" as defined in section 22a-430-3(a) of the RCSA.

"NA" as a Monitoring Table abbreviation means "not applicable".

"NR" as a Monitoring Table abbreviation means "not required".

"Quarterly", in the context of a sampling frequency, means sampling is required in the months of January, April, July, and October.

"Range During Month" or "RDM", as a sample type, means the lowest and the highest values of all of the monitoring data for the reporting month.

SECTION 3: COMMISSIONER'S DECISION

(A) The Commissioner has made a final determination and found that the continuance of the existing system to treat the discharge will protect the waters of the state from pollution. The Commissioner's decision is based on Application No. 200203214 for permit reissuance, and modification, received on July 31, 2002 and the administrative record established in the processing of that application.

(B) The Commissioner hereby authorizes the Permittee to discharge in accordance with the provisions of this permit, the above referenced application, and all approvals issued by the Commissioner or the Commissioner's authorized agent for the discharges and/or activities authorized by, or associated with, this permit.

(C) The Commissioner reserves the right to make appropriate revisions to the permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions that may be authorized under the Federal Clean Water Act or the Connecticut General Statutes or regulations adopted thereunder, as amended. The permit as modified or renewed under this paragraph may also contain any other requirements of the Federal Clean Water Act or Connecticut General Statutes or regulations adopted thereunder which are then applicable.

SECTION 4: EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

(A) The discharges shall not exceed and shall otherwise conform to specific terms and conditions listed below. The discharges are restricted by, and shall be monitored in accordance with, the tables below.

Table A

Discharge Serial Number: 001-A | **Monitoring Location: 1**

Wastewater Description: Ash Leachate

Monitoring Location Description: in effluent pipe after pH adjustment

Discharge is to: The MDC Hartford Sewage Treatment Facility (Facility ID. 064-001) via its conveyance system.

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING		
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency[2]	Sample Type or measurement to be reported
Flow, Instantaneous	gpm	NA	NA	NR	NA	-----	Monthly	Grab
Flow, Maximum Daily[1]	gpd	NA	190,000	Daily/Monthly	Daily Flow	NA	NR	NA
pH, Continuous	S.U.	NA	NA	NR	NA	6-10	Monthly	RDM

Footnotes:

[1] For this parameter the Permittee shall maintain at the facility a record of the Total Daily Flow for each day of discharge and shall report the Maximum Daily Flow for each month and the instantaneous flow at the time of sample collection.

[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

Table _

Discharge Serial Number: 001-A | **Monitoring Location: G**

Wastewater Description: Ash Leachate

Monitoring Location Description: influent to pH adjustment tank

Discharge is to: The MDC Hartford Sewage Treatment Facility (Facility ID. 064-001) via its conveyance system.

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING		
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [1]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency[1]	Sample Type or measurement to be reported
Alkalinity	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Aluminum, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Arsenic, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Barium, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Cadmium, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Chloride	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
COD	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Conductivity	umho/cm	NA	NA	NR	NA	-----	Quarterly	Grab
Copper, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Copper, Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Cyanide, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Hydrocarbon, Total Volatile (Method 8260 plus 2-Chloroethyl Vinyl Ether, Chloromethyl Methyl Ether, 1-Chlorohexane, Trans-1-3-Dichloropropene, and Trichlorofluoromethane	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Iron, Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Iron, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Lead, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Manganese, Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Mercury, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Nickel, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Nitrogen, Ammonia	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Nitrogen, Nitrate	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Potassium	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Sodium	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Solids, Total Suspended	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Solids. Total Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab

Footnotes:

[1] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

Table

Discharge Serial Number: 001-B | **Monitoring Location: 1**

Wastewater Description: Municipal Solid Waste Leachate (Plume Control)

Monitoring Location Description: at manhole prior to mixing with DSN001-A (Ash Leachate)

Discharge is to: The MDC Hartford Sewage Treatment Facility (Facility ID. 064-001) via its conveyance system.

PARAMETER	UNITS	FLOW/TIME BASED MONITORING				INSTANTANEOUS MONITORING		
		Average Monthly Limit	Maximum Daily Limit	Sample/Reporting Frequency [2]	Sample Type or Measurement to be reported	Instantaneous limit or required range	Sample/ Reporting Frequency[2]	Sample Type or measurement to be reported
Alkalinity	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Aluminum, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Arsenic, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Barium, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Cadmium, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Chloride	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
COD	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Conductivity	umho/cm	NA	NA	NR	NA	-----	Quarterly	Grab
Copper, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Copper, Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Cyanide, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Flow, Instantaneous[1]	gpm	NA	NA	NR	NA	-----	Monthly	Grab
Flow, Maximum Daily[1]	gpd	NA	173,000	Daily/Monthly	Daily Flow	NA	NR	Grab
Hydrocarbon, Total Volatile (Method 8260 plus 2-Chloroethyl Vinyl Ether, Chloromethyl Methyl Ether, 1-Chloro -hexane, Trans-1-3-Dichloropropene, and Trichlorofluoromethane)	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Iron, Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Iron, Total	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Lead, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Manganese, Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Mercury, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Nickel, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Nitrogen, Ammonia	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
Nitrogen, Nitrate	mg/l	NA	NA	NR	NA	-----	Monthly	Grab
pH, Continuous	S.U.	NA	NA	NR	NA	-----	Monthly	RDM
Potassium	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Sodium	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Solids, Total Suspended	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Solids. Total Dissolved	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab
Zinc, Total	mg/l	NA	NA	NR	NA	-----	Quarterly	Grab

Footnotes:

[1] For this parameter the Permittee shall maintain at the facility a record of the Total Daily Flow for each day of discharge and shall report the Maximum Daily Flow for each month and the instantaneous flow at the time of sample collection.

[2] The first entry in this column is the 'Sample Frequency'. If this entry is not followed by a 'Reporting Frequency' and the 'Sample Frequency' is more frequent than monthly then the 'Reporting Frequency' is monthly. If the 'Sample frequency' is specified as monthly, or less frequent, then the 'Reporting Frequency' is the same as the 'Sample Frequency'.

(B) All samples shall be comprised of only those wastewaters described in this schedule; therefore, samples shall be taken prior to combination with wastewaters of any other type and after all approved treatment units, if applicable. All samples taken shall be representative of the discharge during standard operating conditions.

(C) In cases where limits and sample type are specified but sampling is not required, the limits specified shall apply to all samples which may be collected and analyzed by, the Department of Environmental Protection personnel, the Permittee, or other parties.

(D) The limits imposed on the discharges listed in this permit take effect on the issuance date of this permit, hence any sample taken after this date which, upon analysis, shows an exceedance of permit limits will be considered non-compliance.

The monitoring requirements of this permit begin on the date of issuance of this permit if the issuance date is on or before the 12th day of a month. For permits issued on or after the 13th day of a month, monitoring requirements begin the 1st day of the following month.

SECTION 5: SAMPLE COLLECTION, HANDLING AND ANALYTICAL TECHNIQUES AND REPORTING REQUIREMENTS

(A) Chemical analyses to determine compliance with effluent limits and conditions established in this permit shall employ methods approved by the Environmental Protection Agency pursuant to 40 CFR 136 unless an alternative method has been approved in writing in accordance with 40 CFR 136.4.

(B) All metals analyses identified in this permit shall refer to analyses for Total Recoverable Metal as defined in 40 CFR136 unless otherwise specified.

(C) The results of chemical analysis required above shall be entered on the Discharge Monitoring Report (DMR), provided by this office, and reported to the Bureau of Materials Management and Compliance Assurance at the following address. The report shall also include a detailed explanation of any violations of the limitations specified. The DMR shall be received at this address by the last day of the month following the month in which samples are taken.

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

(D) If this permit requires monitoring of a discharge on a calendar basis (e.g. Monthly, quarterly, etc.) but a discharge has not occurred within the frequency of sampling specified in the permit, the Permittee must submit the DMR as scheduled, indicating "NO DISCHARGE". For those permittees whose required monitoring is discharge dependent (e.g. per batch), the minimum reporting frequency is monthly. Therefore, if there is no discharge during a calendar month for a batch discharge, a DMR must be submitted indicating such by the end of the following month.

(E) Copies of all DMRs shall be submitted concurrently to the local Water Pollution Control Authority(ies) ("WPCA") involved in the treatment and collection of the permitted discharge.

SECTION 6: RECORDING AND REPORTING OF VIOLATIONS, ADDITIONAL TESTING REQUIREMENTS

(A) If any sample analysis indicates that an effluent limitation specified in Section 4 of this permit has been exceeded, a second sample of the effluent shall be collected and analyzed for the parameter(s) in question and the results reported to the Bureau of Materials Management and Compliance Assurance (Attn: DMR Processing) within 30 days of the exceedance.

(B) The Permittee shall immediately notify the Bureau of Materials Management and Compliance Assurance and the local WPCA of all discharges that could cause problems to the Publicly Owned Treatment Works ("POTW"), including but not limited to slug loadings of pollutants which may cause a violation of the POTW's NPDES permit, or which may inhibit or disrupt the POTW, its treatment processes or operations, or its sludge processes, use or disposal.

(C) In addition to the notification requirements specified in Section 1B of this permit, if any sampling and analysis of the discharge performed by the Permittee indicates a violation of limits specified in Section 4 of this permit, the Permittee shall notify the Bureau of Materials Management and Compliance Assurance within 24 hours of becoming aware of the violation.

SECTION 7: COMPLIANCE CONDITIONS

The Commissioner may provide public notification, in a newspaper of general circulation in the area of the respective POTW, of permittees that at any time in the previous twelve months were in significant noncompliance with the provisions of this permit. For the purposes of this provision, a permittee is in significant noncompliance if its violation(s) meet(s) one or more of the following criteria:

- **Chronic violations:** Those in which sixty-six percent or more of all measurements taken during a six-month period exceed the Average Monthly or Maximum Daily Limit(s) for the same pollutant parameter.
- **Technical Review Criteria violations:** Those in which 33% or more of all of the measurements for each pollutant parameter taken during a six-month period equal or exceed the average or maximum daily limits multiplied by (1.4 for BOD, TSS, oil and grease) or (1.2 for all other pollutants except pH).
- **Compliance Schedule:** Failure to meet within 90 days after the schedule date, a compliance schedule milestone contained in or linked to a respective permit.
- **Noncompliance Reporting:** Failure to accurately report noncompliance in accordance with provisions identified in Section 6 of this permit.
- **Discretionary:** Any other violation of an effluent limit that the Department determines has caused, alone or in combination with other discharges, a violation of the POTW's NPDES permit, inhibition or disruption of the POTW, its treatment processes or operations, or its sludge processes, use or disposal.
- **Imminent Endangerment:** Any discharge of pollutant(s) that has caused imminent endangerment to human health, welfare or to the environment.

This permit is hereby issued on 10/17/07.

Gina McCarthy
Commissioner

GM/GLL

cc: MDC Hartford POTW

CERTIFIED TO BE A TRUE COPY
Connecticut Department of
Environmental Protection

NAME: Theresa Iacone
TITLE: Processing Tech.

APPENDIX B

SPECIFICATIONS FOR PERFORMING DIKE MONITORING SURVEY: HARTFORD LANDFILL

SPECIFICATIONS FOR PERFORMING DIKE MONITORING SURVEY HARTFORD LANDFILL

PREPARED FOR

CONNECTICUT RESOURCES RECOVERY AUTHORITY

PREPARED BY
CONKLIN & SOROKA, INC.
1484 HIGHLAND AVENUE, UNIT 4B
CHESHIRE. CT 06410

FEBRUARY 2001

Specifications for Performing
Dike Monitor Survey

The purpose of these specifications is to establish methods and procedures to run the horizontal and vertical control of the monitoring monuments along the dike to the east of the Hartford Landfill.

The field methods and procedures are developed such that the values obtained are based upon the most effective use of today's equipment and software.

— HORIZONTAL CONTROL —

The field angles and distances will be measured with a total station that measures angles to 3 seconds and distances with a standard mean error of 5 mm ± 5 ppm or less.. All angles are to be measured twice in the direct and reverse positions, with an angular closure of 2 seconds. All distances are to be measured twice with the total station in the direct and reverse position. The mean average of the measured distances should not exceed .01 of a foot.

The horizontal control to be held consists of 4 random monuments on the northbound lane of Interstate 91 and 4 random points, 3 located on Jennings Road and one located on Weston Street (see Attachment "A" for general monument locations) and Attachment "B" for ties and coordinates to the control monuments.

The monitoring monuments are concrete monuments with metal caps located on the dike just to the east of the chain link fence around the landfill. All monitoring monuments are to be occupied and incorporated into the balancing of the traverse.

The traverse is to be balanced utilizing a least squares program with the following estimated error parameters.

	Est. Error
Control monuments	0.005
Distances	0.002
Angles	4.0 seconds
Set-up error	0.003

The coordinates provided are based upon the North American Datum of 1983 projected onto the Connecticut Coordinate System. The bases for the coordinates are Random Monuments A-4485; A-4486; A-4491 and A-4492 along the east side of Interstate 91.

The adjustment of the horizontal traverse should pass at the 95% significance level.

The traverse should also meet the Horizontal Accuracy Class of an A-1 Survey 1:10,000 as outlined in the current Standards for Surveys and Maps.

— VERTICAL CONTROL —

The elevations will be run trigonometrically utilizing a Total Station. Changes will be noted in the direct and reverse positions. Elevations will be referenced to temporary benchmark MH-X with an elevation of 49.492 and BM CHD with an elevation of 32.490. See Attachment "A" for monument locations.

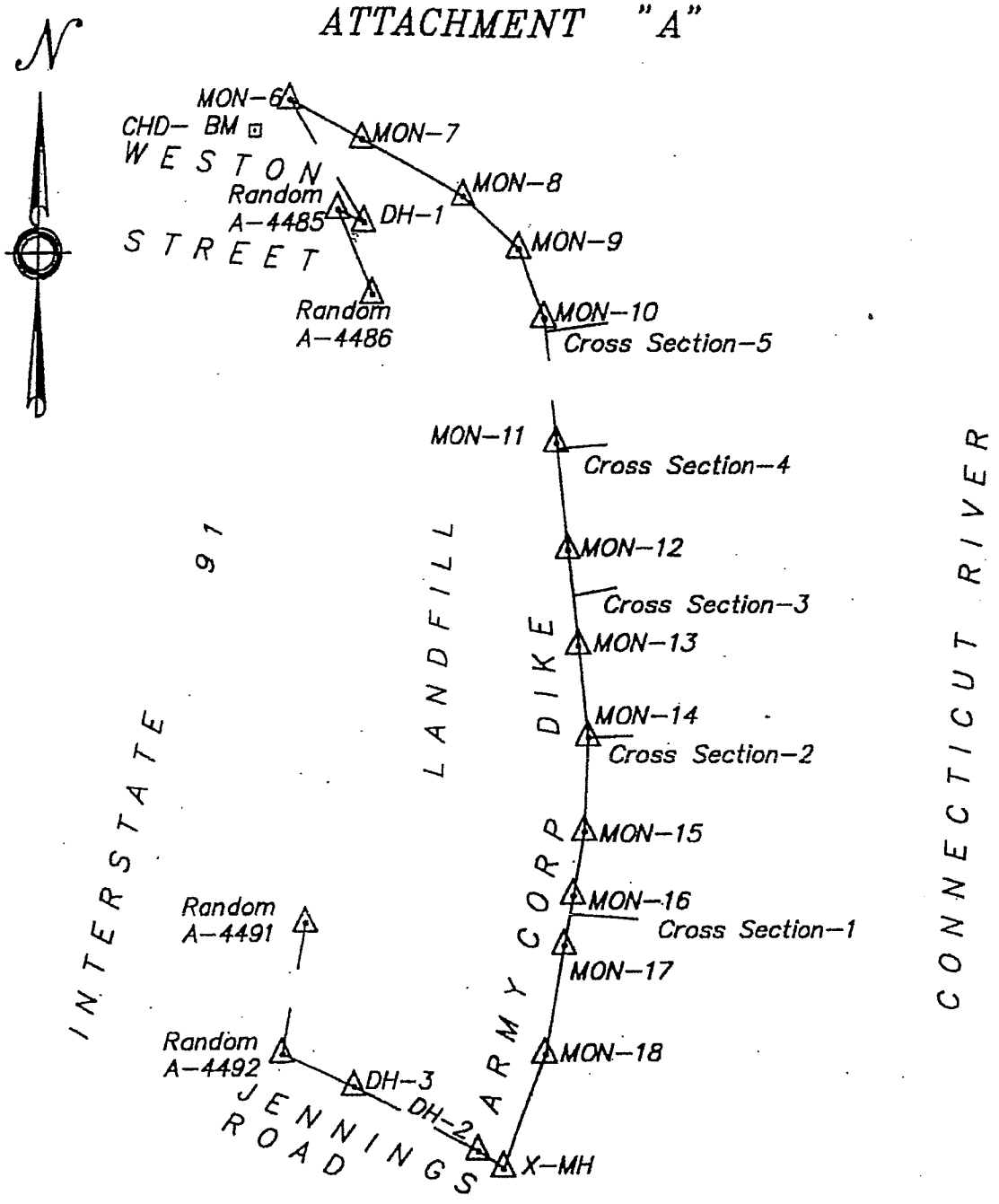
All monitoring monuments are to be held as turn points in the level run. The average change in elevation will be used for balancing in the level run.

The allowable error for each set up shall be the square root of (distance in feet x .00063)] and the allowable error for the total level run shall be .035 (square root of level run in miles), which meets the vertical accuracy of a Class V-2 level loop greater than one mile.

The level run and the traverse shall be run separately from each other.

The accuracies stated above were compiled from Sections 20-300b-1 through 20-300b-20 of the Regulations of Connecticut State Agencies "Minimum Standards for Surveys and Maps in the State of Connecticut" as endorsed by the Connecticut Association of Land Surveyors, Inc., on September 26, 1996.

ATTACHMENT "A"



CONKLIN & SOROKA, INC.

1484 HIGHLAND AVENUE
CHESHIRE, CONNECTICUT 06410
(203) 272-1135

32 WASHINGTON STREET
MIDDLETOWN, CONNECTICUT 06457
(860) 346-2801

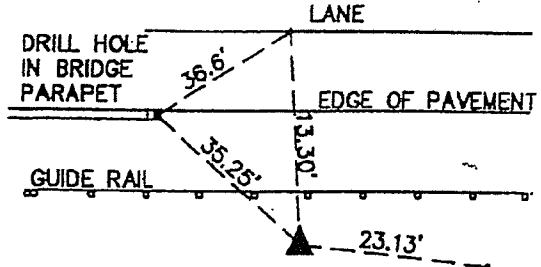
CONSULTING ENGINEERS LAND SURVEYORS LAND PLANNERS

MONITORING WELL & CROSS SECTION LOCATONS
AT THE
HARTFORD LANDFILL
PREPARED FOR
CONNECTICUT RESOURCE RECOVERY AUTHORITY

DATE 10/2/00 SCALE 1"=1000'	FIELD TC FB. NO. 325 COMPS JW	DRN. JW CKD.	CADD INFO. DISK NO. FILE 94-106Q	DISK NO. 1087 JOB NO. 6	PROJECT NO. 94-106Q

ATTACHMENT "B"

A-4485



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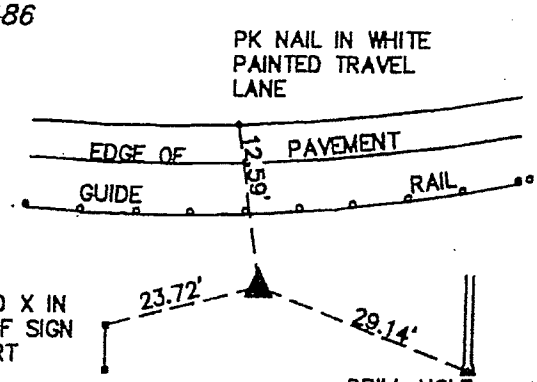
A-4486



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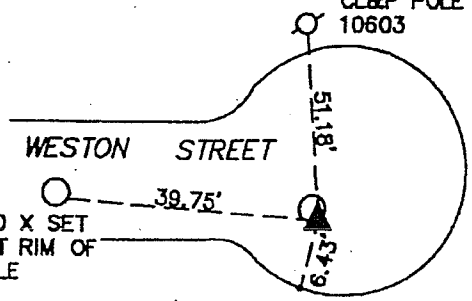

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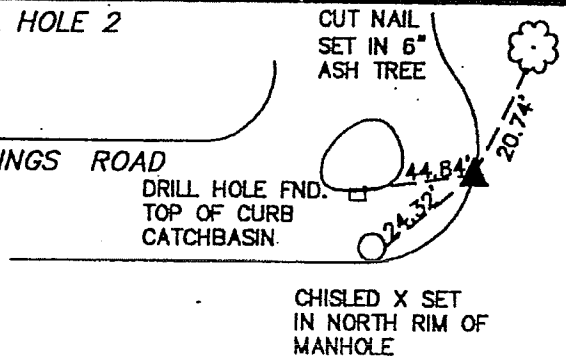

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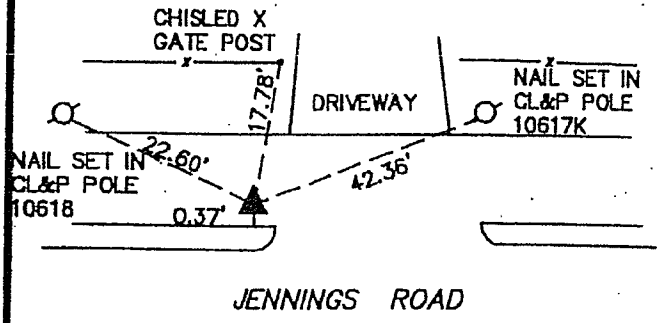

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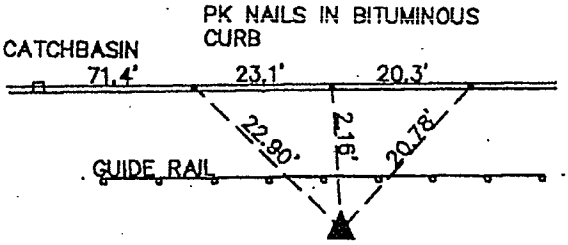

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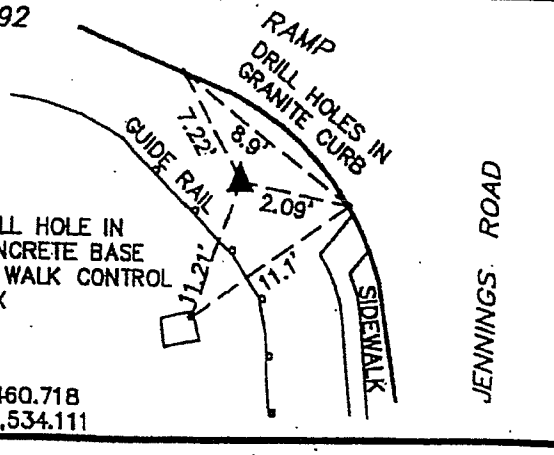

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