DAMES & MOORE

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100% FINAL DESIGN SUBMITTAL
FORMER JUNKER LANDFILL
TOWN OF HUDSON, ST. CROIX COUNTY, WISCONSIN
for
THE LANDFILL REMEDIATION TRUST

April 25, 1997

Note: This report is accompanied by a set of plans entitled "LFG Migration Control Project". These documents are interrelated and are intended to be used and reviewed together.

Dames & Moore Project No. 33178-002

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1.0 INTRODUCTION

The former Junker Sanitary Landfill began operation in 1972, and functioned as a disposal facility under several different management operations until 1987 when it was abandoned. Consequently, the WDNR constructed a clay cap and initiated post-closure care of the site. In the early 1990's, the Agency installed an active gas collection and leachate removal system because of off-site detections of methane. In 1991, the WDNR established a Special Well Construction Area (SWCA) to control private well development in the areas affected by the landfill and a separate industrial facility. The WDNR then considered scoring the site for listing on the National Priorities List. As a result, several potentially responsible parties (PRPs) that disposed of waste at the site performed a remedial investigation/feasibility study (RI/FS) in 1995-1996. This work identified groundwater contamination in monitoring wells and private wells downgradient from the landfill, and gas migration beyond the limits of waste. Subsequently, a Consent Decree for the performance of a remedial design/remedial action (RD/RA) was adopted in July 1996, followed by a Record of Decision (ROD) on August 20, 1996.

The former Junker Sanitary Landfill RD/RA project addresses groundwater contamination, landfill gas movement away from the landfill, and water supply cleanup for impacted and potentially impacted private drinking water wells in accordance with the ROD. The ROD specifies that the following remedial actions occur:

- continued maintenance of the existing landfill cover system and perimeter control including repair to existing subsidence areas;
- continued operation and maintenance of the existing landfill gas and leachate extraction systems;
- creation of deed restrictions on the landfill property;
- extension of the existing landfill cover system over an area of uncovered waste, or excavation and relocation of this waste on-site in a previously capped area;
- reconstruction of the south perimeter ditch and extension of the existing landfill cover system to the south over an area of presumed surface water infiltration;

- installation and maintenance of individual point-of-entry granulated activated carbon water supply treatment units to all households and businesses in the area impacted by the Junker Landfill;
- upgrading of the existing gas extraction system;
- long-term monitoring of groundwater, leachate, condensate, and landfill gas;
- supplemental studies of groundwater quality, landfill seeps, and internal landfill leachate quantities and flow properties; and
- implementation of any additional remedial actions that are found to be necessary by the additional studies of groundwater quality, landfill seeps, and internal landfill leachate quantities and flow properties.

The remedial activities will be completed in accordance with the General Solid Waste Management Requirements and the Investigation and Remediation of Environmental Contamination Requirements as provided in Chapters NR 500 and NR 700 of the Wisconsin Administrative Code (WAC). Chapter NR 504 provides landfill performance and design criteria, NR 514 provides requirements for landfill closure plans; and NR 516 provides landfill construction documentation criteria. Chapter NR 716 provides site investigation criteria, NR 718 specifies requirements for management of solid wastes excavated during response actions, NR 724 provides remedial and interim action design, implementation, operation, maintenance and monitoring requirements and NR 726 provides case closure requirements.

The Junker RD/RA project plans including project schedule, pre-design investigative activities, granular activated carbon (GAC) filter system installation plan, investigative waste plan, and community relations plan was submitted to the WDNR August 29, 1996. The project schedule included progress submittal dates for the remedial design and progress meetings with the WDNR to assure consistency in the remedial design.

2.0 REMEDIAL ACTIONS

2.1 EXCAVATION OF UNCAPPED WASTE

Approximately 1,500 cubic yards of waste located in the uncapped areas on the north side of the landfill will be excavated and consolidated in the previously capped area. The waste will initially be placed in areas where settlement has occurred. Any remaining waste will be placed along the central ridge of the landfill to promote positive surface water drainage toward the perimeter of the landfill. Waste excavated in excess of the estimated 1,500 cubic yards will be placed along the central ridge of the landfill surface which can accommodate up to 3,000 cubic yards.

Prior to waste consolidation, the existing cover system in the settlement areas and along the ridge of the landfill will be stripped, segregated by the material type from each layer (grading layer, clay layer, rooting zone layer, and topsoil) and stockpiled separately. The cover system will be replaced when waste placement is completed in the respective settlement areas and along the ridge. At no time will waste remain exposed to the elements at the end of the work day. It is anticipated that borrow clay will be necessary to maintain the two-foot thickness of the clay layer since it will not be possible to completely segregate the materials. For additional discussion of the bid documents for this activity, refer to Section 4.0. The bid documents are located in Appendix A.

2.2 UPGRADING EXISTING GAS EXTRACTION SYSTEM

Review of the volatile organic compound (VOC) and landfill gas migration data shows the necessity to install two additional gas extraction wells within the area of methane migration (north of GEW-8 and GEW-9) and one additional gas extraction well within the area of highest VOC concentrations (north of GEW-13 and GEW-12). The three additional gas extraction wells will minimize off-site migration of landfill gases and remove VOCs from the landfill, reducing the likelihood of VOCs contaminating the local groundwater supply. In addition, leachate extraction well LEW-1 will be connected to the gas extraction system and be utilized for leachate extraction. Three inch diameter lateral pipes will connect the new wells to the gas header pipe. The laterals are positioned to provide well connections with the shortest lengths of lateral pipe.

Five gas probes were installed along Alexander Road in October 1996 to monitor the migration of landfill gases along the southern property boundary . Methane measurements in the probes along

the south boundary are shown in Table 2.1. The results show a decrease in methane concentrations at several wells since the gas probes were first installed. This is likely due to changes in the operation of the gas extraction system. These changes include both the new Landtec wellhead assemblies which allow more accurate control of the flow conditions at each well and changes in the flow rates at the perimeter wells to contain the migration of landfill gases.

As mentioned previously, one gas extraction well will be placed in areas of high VOC concentrations to assist with the removal of VOCs from the landfill. The analytical data for the first round of VOC gas sampling indicate that one VOC "hotspot" is present in the area of gas extraction wells GEW-11, GEW-12, GEW-13, and GEW-14. The results of the VOC data are detailed in Table 2.2. Historically, GEW-11 has operated continuously, while GEW-12 and GEW-13 were in operation every other month and GEW-14 has remained off since April 1996. The continuous operation of wells GEW-11, -12, -13, and -14 is possible because the new Landtec wellhead assemblies were installed in November 1996. The continuous operation of the four existing wells combined with the installation of the new gas extraction well will assist with VOC removal.

Finally, leachate removal from the landfill is a consideration for the placement of additional gas extraction wells. To develop accurate hydraulic characteristics of the landfill needed for extraction well design, a pump test was performed at the site during November 1996. A six-inch pumping well (LEW-1) was installed at the base of the waste in the center of the saturated refuse area, approximately midway between GEW-7, -8, -9, and -10. A two-inch observation well was also installed about 18 feet from the pumping well. The location of the observation well was chosen based upon the saturated leachate thickness of 18 feet encountered in the pumping well. Leachate level data collected monthly during most of 1996 from extraction wells GEW-7 through GEW-10 indicates consistent head values varying from less than five feet (GEW-10) to approximately 10 feet (GEW-7). The 18 feet of saturated thickness encountered in the pumping well likely represents the greatest leachate depth at the site.

A downhole submersible pump with throttling capability was used for the test. Discharged water was collected in a small tank mounted on an all-terrain vehicle. Drawdown at the pumping well and at the observation well was measured using a Hermit 1000 data logger. The test was repeated three times, twice at a discharge of 1.0 gpm and once at a discharge at 0.1 gpm. The first test was truncated because of pump clogging. The second test, maintained at 1.0 gpm, evacuated the well storage (with no measurable drawdown in the observation well) in about 20 minutes. The final test,

maintained at 0.1 gpm, evacuated the well storage in about two hours, again with no measurable drawdown in the observation well.

Although no drawdown occurred at the observation well during each test, the total drawdown-recovery cycle time at the pumping well was more than three times longer for a similar volume of discharge during the last test, compared to the second test. This indicates that the rapid drawdown measured in the pumping well with the higher discharge volume (1.0 gpm) resulted in delayed yield from the filter pack, causing rapid recovery. Consequently, the third test is more reliable to evaluate hydraulic conductivity, K, using the early time recovery data. A value of $K = 1.5 \times 10^{-5}$ cm/sec (3×10^{-5} ft/min) was computed for this data, using the method of Bouwer and Rice by the Aqtesolv program by Geraghty and Miller. Pump test data is included in Appendix C.

Each of the pump tests performed at the site, including previous tests performed in gas extraction wells GEW-7, -8, -9 and LEW-1 were transient and necessarily utilized transient analysis techniques to determine K. These earlier tests yielded K values ranging from 1.6×10^{-4} cm/sec (GEW-8) to 3.6×10^{-2} cm/sec (GEW-9). Although insufficient information is available to evaluate the earlier data, the leachate extraction system will be designed based upon the lowest yielding well. This is because the pumps proposed for installation in the proposed gas wells (where low permeability conditions are anticipated), will be float activated.

From the third (final) pump test performed in November 1996, approximately 8 gallons/cycle were discharged. Hydraulic conductivity was determined from a total cycle time of 177 minutes. Consequently, approximately 64 gallons per day will be discharged from this well. Applying a total saturated thickness of 18 feet to this discharge yields 3.5 gallons/day/ft of drawdown. The proposed design specifies that two new extraction wells will be installed in the leachate mound area. Assuming that both wells yield 18 feet of saturated thickness, summing the total saturated thickness of the proposed and existing wells including LEW-1 which will be added to the gas extraction system for leachate pumping only, yields 84 total feet of saturated screen length. At 3.5 gallons/day/ft of drawdown, a total discharge of 294 gallons/day can be expected to be removed from the system. This translates to approximately 2,058 gallons every week, or 107,000 gallons/year. (Operations costs for the leachate disposal system have assumed leachate removal from the tank every two weeks. Because the existing tank has a capacity of 4,000 gallons, cost estimates provided in Table 5-1 are based on a limit of 2,000 gallons every week. It is assumed that actual leachate

production will diminish over time. The tank will be set to shut off the leachate extraction system when full.)

The two new wells placed for containment of landfill gas migration will also be designed to pump leachate. Each well will utilize an Anchor piston pump Model 101 set at a discharge of 0.1 gpm. These pumps are manufactured specifically for leachate operation. The wellhead configuration will be designed to house the piston pumps and operate primarily as gas extraction wells. (See detail 2 on Plan Sheet 10 for the proposed gas wells and detail 3 on Plan Sheet 10 for LEW-1). The Anchor pumps will be operated individually by low and high liquid-level electrodes. Control mechanisms directly wired into each pump will allow independent operation.

The existing gas extraction wells will utilize the existing pumps, Grundfos Model 10S03-6, with an operating range of 5-14 gpm. The control mechanism for the Grundfos pumps will be a Coyote Controller. The system will be timed to operate in accordance with the well yield of the lowest permeability well(s). The Coyote Controller detects changes in amperage, and will turn the pumps off as the amperage drops off when the well goes dry. After a timed period it will turn the pumps back on. The timed period can be determined from pump test data.

The pumping system will be tied into the gas extraction system shutdown conditions. In the event of a gas extraction system failure or if the level of the condensate tank activates the high level shutoff, the entire system will be shutdown. To conform with this design, electrical conduit will be installed from the control box on the landfill, located in the vicinity of GEW-7 and GEW-10, to the control panel at the blower building.

2.3 RECONSTRUCTION OF THE SOUTH PERIMETER DITCH

The results of the clay cap investigation along the south perimeter ditch indicate that approximately 600 cubic yards of clay are missing from this area, having been removed for placement of the gas system header pipe. The clay cap will be replaced with clay from an approved borrow source. Regrading of the south perimeter ditch will permit adequate drainage to the onsite detention ponds. The design allows a slope of 0.5%, 0.7% or 1.2% along the entire length of the ditch. It is designed as a 2 feet deep, 4-feet wide trapezoidal ditch, located six to ten feet from Alexander Road, with 3:1 side slopes. This design allows one foot freeboard. With this design, the two manholes in the ditch are bypassed. The cap design will consist of two feet of clay and two feet of rooting soils/topsoil as

indicated on Plan Sheet 8 of the Drawings. Clay was chosen as the barrier layer material in the south ditch in lieu of a geomembrane because a clay borrow source was also needed for the relocation of uncapped waste. Replacement of the clay and regrading the ditch will minimize potential infiltration in this area.

2.4 EXISTING COVER SYSTEM MAINTENANCE

Short Elliott Hendrickson (SEH) currently monitors the condition of the clay cap during weekly site visits and monthly site walks. The cap is monitored for signs of erosion, settlement, leachate seepage, burrowing, or other disturbances. No new settlement areas have been noted. Dames & Moore monitors the site monthly for leachate seeps. No seeps were detected during the site walks, although areas of trampled grass and moist conditions were noted on the side slope nearest the northeast detention pond. The most recent seep detection occurred the week of March 11, when SEH personnel noted a seepage near the northeast detention pond that appeared to be water, not leachate. No sample was collected at this time. This seep will be investigated by Dames & Moore personnel in April 1997. If future seeps are detected, a sample will be collected according to surface water sampling techniques and analyzed for semi-volatile organic comopunds (SVOCs) and Resource Conservation Recovery Act (RCRA) metals. The monitoring of the conditions of the cap will continue to be part of the Operation, Maintenance, & Monitoring Plan (OM&M Plan) for the site.

2.5 ABANDONMENT OF THE PASSIVE GAS VENTING SYSTEM

Since the existing passive gas venting system may be a source for infiltration of oxygen into the landfill, the passive system will be abandoned. System abandonment will consist of excavating the cover soils (including the clay layer) to expose the vent riser pipes, cutting off the vent riser pipe below the cover soils, capping the remaining riser pipe, and replacing and compacting the cover soils. The removed vent pipe will be salvaged by the Contractor or properly disposed of in designated areas within the capped landfill.

2.6 REPAIR OF GROUNDWATER MONITORING WELL MW-4

Groundwater monitoring well MW-4 has a cracked riser pipe near the landfill surface. The well will be repaired by exposing the damaged section of pipe, cutting the pipe to remove the cracked section, and reconnecting the riser pipe with a PVC coupling.

2.7 INVESTIGATION OF EXISTING LATERAL GAS EXTRACTION SYSTEM PIPING AND ADDITION OF VACUUM MONITORING POINTS

The existing lateral piping in the area of saturated waste will be inspected in areas of known or suspected settlement. Approximately 425 feet of the lateral piping in the areas of IB-1, IB-4, GEW-9, GEW-20, GEW-21 and the header crown near GEW-7 will be exposed and surveyed to determine current pipe elevations and slopes. The current elevations and slopes will be compared with those on the Record Drawings dated October 1993. Piping elevations and slopes will be reviewed on a case-by-case basis. If significant settlement, as determined by the Engineer, has occurred along the length of pipe, it will be reset and rebed as required to bring it within the construction tolerances listed in the Specifications. Four vacuum monitoring points will be added along the excavated lengths of lateral piping to assist with defining future liquid blockage areas within the landfill. Vacuum monitoring points will be placed at each end of settlement area IB-4 and at each end near settlement area IB-6.

2.8 OPERATION AND MAINTENANCE OF LANDFILL GAS AND LEACHATE EXTRACTION SYSTEMS

SEH currently operates and maintains the existing landfill gas and leachate extraction system. Initial efforts included operating the system regressively to lower oxygen levels and bring methane concentrations back to acceptable levels. For several months, only extraction wells GEW-7, GEW-8, GEW-9, GEW-10 and GEW-11 operated continuously. Gas extraction wells GEW-1, GEW-14, GEW-15, GEW-16, GEW-17 and GEW-18 have not operated since April 1996 while the remaining wells were turned off and on, depending on oxygen levels in the extracted landfill gas. (Note that GEW-16 is outside the limits of waste and therefore is not considered an operable well). New Landtec wellhead assemblies, permitting finer tuning of gas flow rates, were installed on twelve of the gas extraction wells (GEW-2 through GEW-13) during November 1996.

Current operation of the extraction wells involves maintaining flow through the wells with the Landtec Accuflo wellhead assemblies. All of the gas extraction wells with the new wellhead assemblies are operating, except GEW-6 because the lateral piping froze. The remaining gas extraction wells, GEW-1 and GEW-14 through GEW-18, have frozen butterfly valves. These wells will also have the new wellhead assemblies installed during Spring of 1997. The perimeter wells GEW-8 and GEW-9 have operated at consistent levels since the gas probe installations while total

gas flow at GEW-12 has doubled since October. This increase in flow, combined with the more precise control obtained with the new wellhead assemblies may explain the reduction of methane and VOC concentrations observed in several of the gas probes along the southern boundary of the landfill.

The leachate monitoring system currently consists of three leachate head wells and seventeen gas extraction wells. The leachate levels in these wells are monitored on a monthly basis. Historically, the highest leachate levels have been measured in gas extraction wells GEW-7, -8, -9 and -10 with little or no leachate measured in the remaining wells. Gas extraction wells GEW-7, -8, -9 and -10 have been modified with Landtec Accuflo wellheads that are capable of pumping both leachate and landfill gases. The connection of these four wells to the header pipe will facilitate removal of leachate from the landfill in areas where the observed leachate thickness is greatest. In addition, two gas extraction wells (GEW-20 and -21) will be installed in the vicinity of wells GEW-7, -8, -9 and -10 that will also have the capability to pump leachate through the main header pipe, as mentioned in Section 2.2. Additional information about the operation and maintenance activities at the landfill is located in the OM&M Plan.

2.9 REMEDIATION OF DRINKING WATER SUPPLIES

Landfill gas source removal and minimization of infiltration are two important features of the remedial action. The gas removal option was discussed in Section 2.2 and minimizing infiltration was discussed in Sections 2.1 and 2.3. Removing landfill gas and minimizing infiltration will reduce the likelihood that additional contaminants will enter the water supply. However, the existing off-site groundwater conditions require immediate measures to protect the health and welfare of the local residents. Therefore, the installation of point-of-entry granular activated carbon (GAC) filter systems is being implemented for residences and businesses within Sections 13, 14, 15, 22, 23, and 24 of the SWCA. The groundwater sampling of the private wells within the SWCA has been completed and all analytical data received. The results were communicated to the homeowners. Included with the laboratory results were two request forms for the GAC filter system installation. The homeowner WDNR form was submitted with the laboratory data in addition to another WDNR form that was completed by an agent of the Landfill Remediation Trust. These completed forms and data were sent to Mr. Bob Schaefer at WDNR-Water Supply. The general approval by the Department of Commerce for the JL-100 and JL-300 units was granted on January 7, 1997. Wells which contained high levels of iron are being provided with iron pre-filters to prevent clogging of the GAC system.

The Trust will provide the iron pre-filters, but maintenance will be the responsibility of the residents, as the frequency of maintenance required will vary according to usage.

The current SWCA boundaries were reviewed to determine if additional sampling was necessary to define the extent of the Junker Landfill plume. Figure 2.1 shows the TCE concentrations as measured in private wells for the Junker Landfill area. The PCE plume is contained within the boundaries of the TCE plume and PCE concentrations are not shown. There are several homes located on the edge of the plume near the landfill or near the Norflex facility well where VOCs were detected. Due to their close proximity to the other VOC detect wells, it is recommended that wells at the following locations be sampled and analyzed for VOCs:

875 Jane Circle	876 Jane Circle
860 Young Road	721 Norflex Drive

If sample analyses indicate that these wells are impacted by the Junker Landfill plume, additional sampling may be required. Any impacted wells will be included in the water replacement (GAC installation) component of the remedy.

The groundwater flow pattern near the Junker Landfill has been documented by Wenck to follow a northwesterly path. Groundwater elevations collected by SEH in 1996 support this finding.

2.10 IMPLEMENTATION OF ON-SITE INSTITUTIONAL CONTROLS

Institutional controls at the former Junker landfill site include obtaining a temporary injunction allowing the Trust access to the Landfill and preventing others from tampering with the work at the site. This is the first step in obtaining a deed restriction which will prevent future development of the landfill. This is necessary to avoid damage to the clay cap and gas extraction or leachate collection systems. A hearing was held in St. Croix County District Court on September 25, 1996 for these access restrictions.

The Trust is currently notified of new wells constructed within the SWCA via the well variance program maintained by the WDNR. Dames & Moore personnel are copied on all variances granted in the Hudson, WI area. The Trust contacts well owners and schedules an initial well sampling. This sampling is communicated to the well owner and used to determine the size of the filter the well

owner requires. The owner is offered that filter, installed and maintained by the Trust. If the owner accepts the offer of a filter, an application is filed with the WDNR-Water Supply. Once approval of the filter system is received, Culligan contacts the well owner to schedule the filter installation. The first influent/effluent sampling is conducted within 2 weeks of the carbon filter installation.

If the owner declines the offer of a filter system, they are notified of the intent to file a deed affidavit on their property. This affidavit will inform prospective buyers of the property of the opportunity to have a carbon filter system installed and maintained by the Trust.

Table 2.1
Methane, Carbon Dioxide and Oxygen Levels in Gas Monitoring Probes
Former Junker Landfill, Town of Hudson, St. Croix County, WI

Probe Location	Methane, % Volume					Carbon Dioxide, % Volume					Oxygen, % Volume					Balance Gases, % Volume					Static Pressure, inches water				
	10/29	11/6	12/18	1/22	2/20	10/29	11/6	12/18	1/22	2/20	10/29	11/6	12/18	1/22	2/20	10/29	11/6	12/18	1/22	2/20	10/29	11/6	12/18	1/22	2/20
GMW-1A	NA	0.0	0.0	0.0	0.0	NA	6.9	0.0	0.2	7.2	NA	14.9	20.6	20.2	13.9	NA	78.2	79.4	79.6	78.9	NA	1.3	0.06	0.26	0.14
GMW-1B	NA	0.0	0.0	0.0	0.0	NA	8.1	6.8	2.0	2.2	NA	0.0	12.9	18.6	18.2	NA	91.9	80.3	79.4	79.6	NA	1.2	0.05	0.30	0.00
GMW-2A	NA	47.3	38.3	41.5	33.1	NA	33.2	33.1	34.5	33.0	NA	2.6	0.5	0.0	0.0	NA	17.0	28.1	24.0	33.9	NA	1.2	0.07	0.27	0.09
GMW-2B	NA	40.2	46.0	40.1	55.5	NA	29.6	33.0	31.3	42.2	NA	2.7	3.5	4.3	0.0	NA	27.5	17.5	24.3	2.3	NA	1.1	0.02	0.31	0.20
GMW-3	NA	0.0	0.0	0.0	0.0	NA	6.7	0.0	5.6	5.1	NA	101	21.3	16.0	16.7	NA	93.3	78.7	78.4	78.2	NA	0.9	0.06	0.17	0.10
GMW-4A	NA	0.0	0.0	0.0	0.0	NA	1.4	1.3	0.0	2.5	NA	18.9	17.3	20.3	17.2	NA	79.4	81.4	79.7	80.3	NA	0.8	0.01	0.21	0.12
GMW-4B	NA	0.0	0.0	0.0	0.0	NA	2.8	0.9	1.0	1.2	NA	17.6	18.4	18.9	19.5	NA	79.6	80.7	80.1	79.3	NA	0.8	0.01	0.14	0.06
GMW-5S	9.9	9.2	2.2	3.6	0.1	21.1	19.5	9.8	11.6	2.4	0.0	0.2	8.6	7.1	18.1	79.0	71.7	79.4	77.7	79.4	0.4	0.9	0.01	0.16	0.06
GMW-5I	10.1	6.8	7.8	1.8	10.4	18.0	18.8	16.2	11.2	21.8	5.0	0.7	3.2	5.9	0.0	76.9	73.7	72.8	81.1	67.8	0.72	1.0	0.01	0.32	0.10
GMW-5D	6.1	13.3	2.9	0.3	9.5	19.1	21.5	5.7	0.9	15.5	0.2	0.0	14.4	19.3	4.5	74.6	65.2	77.0	79.5	70.5	0.72	1.1	0.01	0.28	0.12
GMW-6S	47.6	41.5	12.0	12.5	16.0	31.2	27.6	22.3	9.8	23.0	0.0	0.0	0.0	12.8	0.0	21.2	30.9	65.7	64.9	61.0	0.11	0.8	0.01	0.07	0.00
GMW-6I	57.7	22.3	39.2	14.0	49.0	38.6	15.7	24.6	10.5	34.0	0.0	7.6	1.9	12.1	0.0	3.7	54.4	34.3	63.4	17.0	0.35	1.0	0.08	0.21	0.15
GMW-6D	34.8	0.8	30.1	28.5	8.3	33.2	2.2	27.0	23.2	8.0	0.0	19.1	1.0	2.5	15.2	32.0	77.9	41.9	45.8	68.5	0.5	1.1	0.06	0.28	0.08
GMW-7	NA	4.5	6.6	11.7	6.7	NA	20.6	21.7	12.8	23.4	NA	0.3	0.0	9.2	0.0	NA	74.7	71.7	66.3	69.9	NA	0.8	0.02	0.24	0.07
GMW-8S	0.0	0.0	0.0	0.2	0.0	8.0	4.2	1.8	1.2	1.2	11.3	17.1	17.8	19.2	19.8	80.7	78.7	80.4	79.4	79.0	0.02	0.5	0.01	0.04	0.02
GMW-8I	0.0	0.0	0.0	0.0	0.0	10.8	14.0	0.8	0.4	0.4	7.1	4.1	19.0	19.8	20.3	82.1	81.9	80.2	79.8	79.3	-0.24	0.6	0.01	0.06	0.01
GMW-8D	0.0	0.0	0.0	0.1	0.0	19.5	1.3	8.4	6.2	1.3	3.5	19.3	10.5	11.2	19.3	77.0	79.3	81.1	82.5	79.4	0.3	0.9	0.3	0.30	0.08
GMW-9	1.8	1.1	0.6	0.0	0.0	5.7	6.0	6.0	1.2	3.5	2.0	2.3	0.7	18.2	14.0	90.5	90.6	92.7	80.6	82.5	0.7	0.8	0.10	0.47	0.16
GMW-10	1.1	0.4	0.0	0.0	0.1	1.1	6.6	0.3	0.0	5.9	6.8	1.1	19.7	20.1	3.7	91.0	91.9	80.0	79.9	90.3	0.94	0.8	0.01	0.67	0.17

Notes:

NA: Data were not available. Data were gathered for the newly installed gas probes, GMW-5 through GMW-10 by SEH, Inc. at the request of the WDNR. Values for GMW-7 were not obtained as the installation was not complete at the time of data collection.

Table 2.2
VOC Gas Extraction Well Sampling Results
Concentration as Parts per Billion by Volume (*ppbv*)
Former Junker Landfill, Town of Hudson, St. Croix County, WI
September 30, 1996

Chemical	Fld Blk	GEW-1	G0EW-2	GEW-3	GEW-4	GEW-5	GEW-6	GEW-7	GEW-8	GEW-9	GEW-10	GEW-11	GEW-12	GEW-13	GEW-14	GEW-15	GEW-17	GEW-18
Vinyl Chloride	<2	1200	490	120	5700	910	160	950	970	800 810	1400	3400	5500	7500	11000	6800 7900	1000	870
Methylene Chloride	<2	<230	<180	<72	<81	<72	270	<170	<87	<180 <180	<170	<350	2600	2800	<600	<90 <72	<75	<230
1,1-DCA	<2	<230	<180	<72	<81	<72	47	<170	<87	<180 <180	<170	<350	210	540	<600	<90 <72	<75	<230
cis-1,2-DCE	<2	<230	<180	<72	2400	79	66	<170	<87	<180 <180	<170	<350	2400	4000	2200	690 700	<75	<230
TCE	<2	<230	<180	<72	160	<72	79	<170	<87	<180 <180	<170	<350	2400	1000	<600	<90 <72	<75	<230
PCE	<2	<230	<180	<72	220	<72	500	<170	<87	210 <180	<170	<350	5300	2100	<600	<90 <72	<75	<230
Chloro Ethane	<4	2400	<360	<140	<160	380	110	<350	180	<360 <360	<340	<700	<350	<360	<1200	330 370	290	1900
Benzene	<2	960	510	<72	350	240	74	230	300	240 <180	220	540	710	900	1200	100 96	240	310
Chloro benzene	<2	<230	<180	<72	110	<72	<35	<170	140	<180 <180	<170	<350	<170	<360	<600	<90 <72	<75	<230
Ethyl Benzene	<2	42000	2800	2700	3700	4000	1100	3300	4700	7800 8500	5200	20000	11000	5000	8200	1400 1600	2900	7100
1,3,5-Trimethyl benzene	<2	990	230	260	340	540	250	740	710	470 470	780	900	490	350	<600	180 230	260	880
1,2,4-Trimethyl benzene	<2	2000	380	700	700	1100	490	1200	1400	1100 1200	1600	1800	1300	880	830	290 360	540	1700

Table 2.2
VOC Gas Extraction Well Sampling Results
Concentration as Parts per Billion by Volume (*ppbv*)
Former Junker Landfill, Town of Hudson, St. Croix County, WI
September 30, 1996

Chemical	Fld Blk	GEW-1	G0EW-2	GEW-3	GEW-4	GEW-5	GEW-6	GEW-7	GEW-8	GEW-9	GEW-10	GEW-11	GEW-12	GEW-13	GEW-14	GEW-15	GEW-17	GEW-18
Toluene	<2	9900	2600	94	7300	960	2300	1900	2900	7500 6600	2400	19000	36000	29000	57000	740 720	3000	6000
4-Ethyl toluene	<2	1500	240	330	710	940	480	1200	1400	1200 1000	1600	1700	1200	730	<600	290 390	480	1800
Total Xylenes	<2	190000	21000	5400	11000	8500	3700	14000	12000	25000 25000	15000	62000	36000	16000	27000	4000 4600	11000	30000
Styrene	<2	<230	<180	<72	<81	<72	<35	<170	<87	<180 <180	<170	<350	<170	<180	<600	<90 <72	<75	<230
Acetone	<10	<1100	<900	<360	<410	<360	220	<870	<440	<900 <900	<840	<1700	3600	2800	<3000	500 540	<370	<1100
2-Propanol	<20	<2300	<1800	<720	<810	<720	<350	<1700	<870	<1800 <1800	<1700	<3500	4000	<1800	<6000	<900 <720	<750	<2300
2-Butanone	<10	<1100	<900	<360	<410	<360	580	<870	<440	<900 <900	<840	<1700	4100	3200	<3000	1900 2000	860	<1100
Hexane	<10	1400	920	<360	780	920	750	1100	990	<900 <900	<840	<1700	<870	2100	<3000	1600 1600	710	<1100
Cyclo hexane	<10	<1100	<900	<360	430	560	1000	1000	750	<900 <900	<840	<1700	<870	1600	<3000	1700 1800	460	<1100
Tetrahydro furan	<10	14000	3800	450	610	1300	1700	1300	1400	6900 6700	3100	3300	3100	5000	<3000	3500 3600	3800	<1100
Heptane	<10	7000	3600	550	1600	1400	2800	3900	2000	<900 <900	1700	2400	1900	3800	5200	2600 2800	2900	5000
Freon 11	<2	<230	<180	<72	350	<72	<35	<170	170	2500 2400	<170	<350	660	340	<600	<90 <72	<75	<230
Freon 12	<2	<230	<180	<72	410	380	41	<170	180	<180 <180	190	440	860	2800	710	<90 <72	<75	<230

LEGEND:

- DEEP AQUIFER WELL (NON-DETECT)
- NON-DETECT
- BELOW ES
- ABOVE ES
- SPECIAL WELL CONSTRUCTION AREA (SWCA)
- RESIDENTIAL LOT - NO WELL
- MONITOR WELL MW-15B
- WENK MONITOR WELL WW-16
- NOR-LAKE MONITOR WELL NLMW-13

Road
Todd La.
Granada Rd.
Mc Cutcheon Road
Bakken La.
Holden Lane
Alexander
Moonbeam Rd.
100th Ave.
TROOP HOUSE
DAY CAMP
Glow Rd.
Johnny Cake Ln.
Ben Jamin La.
Schommer Dr.
Norflex Dr.
Trail
Kelly Road
Badlands
Mustang Dr.
Stagecoach Trail
Wagon Wheel Dr.
Chippewa Path
Yellowstone Trail
Hutton Rd.
Young Rd.
Daisy Ln.
Wildwood Dr.
Red Oak Dr.
Pollard Rd.
MW-15B
NLMW-13
WW-16
WW-13
MW-11
MW-3
MW-4
MW-5
MW-6
MW-7
MW-9
15
14
13
22
23
24
21
12
A
J

JUNKER LANDFILL

NORTH

DO NOT SCALE

FORMER JUNKER LANDFILL
TOWN OF HUDSON, WISCONSIN

FIGURE 2-1
TCE CONCENTRATIONS IN WELLS

DAMES & MOORE

DATE: MARCH 1997

PROJ. No.: 33178-002

3.0 PROJECT CONSTRUCTION AND OPERATION SCHEDULE

Figure 3.1 shows the schedule that has been and will continue to be implemented for the remainder of the project.

The construction schedule will begin with a public bid of the project for a period of approximately three weeks during May 1997. The first phase of construction for installation of the gas extraction wells and supporting header pipe will begin in June 1997; excavation of the uncapped waste will begin after the wells and lateral pipe are installed in late June 1997; the reconstruction of the south perimeter ditch will begin in July 1997, providing location of future wells and pipe laterals do not interfere with waste placement.

Figure 3.1: PROJECT SCHEDULE
Junker Sanitary Landfill
Remedial Design and Remedial Action

TASK (Week Ending)	1996 8/2	8/9	8/16	8/23	8/30	9/6	9/13	9/20	9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20	12/27	1997 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Task 1-RD/RA Plans																																		
1/A-Description & Qualification of Personnel																																		
1/B- Schedule for Completion of Tasks																																		
1/C-Pre-Design Investigative Work Plan - Draft/Final																																		
1/C - Pre-Design Investigation Activites																																		
1. Radius of influence-gas extraction system																																		
2a. Groundwater VOC sampling @ Town Hall																																		
2b. VOC & Inorganic sampling of groundwater in SWCA																																		
3. VOCs measurements at gas extraction wells & probes																																		
4. Evaluate Seeps																																		
5. Define extent of clay																																		
6. Survey of landfill area																																		
7. Install gas probes @ N,E,& S boundary																																		
8. Excavate refuse N of landfill & regrade subsidence areas **																																		
9. Leachate Mound Analysis (well installation & pumping test)																																		
10. Obtain Access Agreements																																		
1/D-Investigative Waste Plan																																		
1/E-Draft/Final Community Relations Plan																																		
Install GAC filters																																		
GAC System Sampling															x								+											
Task 2-Remedial Design																																		
2/A-Health & Safety Plan																																		
2/B-Quality Assurance Project Plan																																		
2/C-Design Plans																																		
1. Construction & Operation Schedule																																		
2. Draft Design, Plans & Specs																											○	●						
3. Operation & Maintenance Plan																																		
4. Draft Design, Cost Estimate																																		
5. Construction Quality AssurancePlan																																		
2/D-Monitoring Program Plan																																		
2/E-Design Phases (see 2/C)																																		
2/F-Additional Studies																																		
2/G-Progress Meetings																																		
Task 3 - Remedy Construction																																		
1. Preconstruction Meeting																																		
2. Prefinal Inspection																																		
3. Final Inspection																																		
Task 4 - Progress Reports																																		
Task 5-Constr Completion Report																																		
1. Draft Construction Completion Report																																		
2. Final Construction Completion Report																																		
Task 6-Remedy Documentation																																		
1. Draft Completion Remedy Report																																	⊠	
2. Final Completion Remedy Report																																	⊠	

Target initiation of activity

Target completion of activity

x Initial GAC sampling of effluent will occur within 15 working days of installation
\+ Annual sampling of GAC systems hereafter
○ Bid Documents
● Bidding (assumes 3 week bid period)
⊠ Due 14 years after construction completion document
** Assumes survey (I/C 6.) is complete within specified time, and no weather delays occurs.

4.0 BIDDING DOCUMENTS

The proposed bidding documents are set up as a third party contract, meaning that the Contractor will contract directly with the Landfill Remediation Trust. These documents have been developed for the Design Engineer to provide construction oversight on behalf of the Client, but with no contractual relationship with the Contractor.

4.1 CONSTRUCTION SPECIFICATIONS

Technical specifications are prepared according to the Construction Specifications Institute (CSI) format, which is a standardized format used by a large percentage of consultants, contractors and governmental agencies. The technical specifications include the information required for a contractor to excavate the uncapped waste and place under the cap in subsidence areas; addition of gas extraction wells and associated piping; and reconstruction of the south perimeter ditch as this work is planned for one contract. The specifications developed for the Junker Landfill are included with this design submittal in Appendix A.

4.2 CONSTRUCTION DRAWINGS

The construction drawings in conjunction with technical specifications will illustrate the technical information required for a contractor to excavate the uncapped waste and place it under the cap, install additional landfill gas extraction wells, and reconstruct the south perimeter ditch at the Junker Landfill. The drawings developed for the Junker Landfill are included with this design submittal.

4.3 ADDITIONAL WASTE CUTTINGS

Drummed cuttings from the leachate pumping and monitoring well installation will be placed into the areas planned for placement of the excavated waste. Cuttings generated by the new gas extraction well installations and trench spoils from the placement of the header pipe extensions will be also disposed in this area. The volume of waste that will be generated with these activities is estimated to be 640 cubic yards, based on the installation of the leachate pumping and extraction wells, three gas extraction wells and 460 feet of lateral pipe.

5.0 PROJECT COST ESTIMATE

At this phase of the design plan, the quoted cost for the leachate pumps and the gas extraction wells and wellhead assemblies have been included in the project cost estimate. The estimate includes work associated with placing the uncapped waste beneath the existing cover and regrading subsidence areas, regrading and capping the south perimeter ditch, adding three gas extraction wells to assist with removal of methane, VOCs and leachate, installation of the granular activated carbon filters in the private homes, and O&M of the gas extraction system and granular activated carbon systems in the private homes. The cost estimate is detailed in Table 5.1. Additional cost estimate details are included in Appendix D.

The WDNR and a group of PRPs recently agreed to a funding arrangement for capital and operating expenses for implementing remedial activities along with an annuity for the subsequent 25 year long-term care period. The agreement was predicated on including a 25 percent contingency on capital and operating costs until the time that the first $3 million are expended. Subsequently, the remaining costs would include a 35 percent contingency through the remaining years of the long-term care period. The costs in Appendix D include projected, discounted (at 2% and 5% annual returns) as well as undiscounted annual cost requirements incorporating these contingencies.

Table 5.1 : Former Junker Sanitary Landfill
Remedial Action Cost Evaluation - Including Annual O&M Costs

Remedial Action: *Excavation of Uncapped Waste; Reconstructing the South Perimeter Ditch; Upgrading Existing Gas Extraction System; Remediation of Drinking Water Supplies; Implementing On-Site Institutional Controls; Existing Cover System Maintenance Operation & Maintenance of Landfill Gas & Leachate Extraction Systems; and Long-Term Monitoring Program*

TASK	QTY	UNIT	RATE	AMOUNT
CAPITAL COSTS - EXCAVATION OF UNCAPPED WASTE				
Mobilization/Demobilization	1	L.S.	$10,000.00	$10,000
Clearing & Grubbing	2.1	AC	$2,000.00	$4,200
Existing Cover Soil Stripping & Segregated Stockpiling	17,000	C.Y.	$3.00	$51,000
Waste Handling	1,500	C.Y.	$5.00	$7,500
Borrow Site Topsoil Stripping	300	C.Y.	$3.00	$900
Clean Borrow Soil Excavation, Import & Placement	1,500	C.Y.	$7.00	$10,500
Low Permeability Soil Excavation, Import & Placement	1,700	C.Y.	$9.00	$15,300
Borrow Site Restoration	0.4	AC	$4,000.00	$1,600
Silt Fence	230	L.F.	$2.00	$500
On-Site Clay Replacement	5,100	C.Y.	$3.00	$15,300
On-Site Root Zone Soil Placement	8,500	C.Y.	$2.00	$17,000
Existing Topsoil (6")	1,700	C.Y.	$2.00	$3,400
Seeding Mix No. 20	280	LBS	$3.75	$1,100
Fertilizer	6.5	CWT	$85.00	$600
Mulch	10,200	SY	$0.10	$1,000
Topographic Surveys	1	L.S.	$10,000.00	$10,000
Contingencies (25%)				$37,500
Subtotal:				$187,400
CAPITAL COSTS - RECONSTRUCTION OF THE SOUTH PERIMETER DITCH				
Clearing & Grubbing	0.7	AC	$2,000.00	$1,400
Topsoil Stripping & Stockpiling	570	C.Y.	$3.00	$1,700
Excavate Existing Soil to Clay Subgrade	1,500	C.Y.	$2.00	$3,000
Low Permeability Soil Excavation, Import & Placement	600	C.Y.	$11.00	$6,600
Ditch Excavation	640	C.Y.	$3.00	$1,900
Silt Fence	1,230	L.F.	$2.00	$2,500
Root Zone Soil Placement	2,600	C.Y.	$2.00	$5,200
Topsoil (6")	570	C.Y.	$2.00	$1,100
Erosion Mat	1,350	S.Y.	$1.10	$1,500
Seeding Mix No. 20	100	LBS	$3.75	$400
Fertilizer	2	CWT	$85.00	$200
Mulch	3,425	SY	$0.10	$300
Topographic Surveys	1	L.S.	$5,000.00	$5,000
Contingencies (25%)				$7,700
Subtotal:				$38,500

Table 5.1 : Former Junker Sanitary Landfill
Remedial Action Cost Evaluation - Including Annual O&M Costs

Remedial Action: *Excavation of Uncapped Waste; Reconstructing the South Perimeter Ditch; Upgrading Existing Gas Extraction System; Remediation of Drinking Water Supplies; Implementing On-Site Institutional Controls; Existing Cover System Maintenance Operation & Maintenance of Landfill Gas & Leachate Extraction Systems; and Long-Term Monitoring Program*

TASK	QTY	UNIT	RATE	AMOUNT
CAPITAL COSTS - GAS SYSTEM Modifications (Assumes 3 new gas extraction wells)				
Gas Extraction Wells	210	V.F.	$110.00	$23,100
Wellhead Assemblies	3	EA	$3,000.00	$9,000
Gas Header Pipe	460	L.F.	$20.00	$9,200
Gas Header Valve Assemblies	3	EA	$3,000.00	$9,000
Drip Traps	3	EA	$2,500.00	$7,500
Leachate Pumps & Controls	3	EA	$5,900.00	$17,700
Protective Structures Around Wellheads	3	EA	$1,200.00	$3,600
Abandon Passive Gas Venting System	14	VENTS	$100.00	$1,400
Repair Groundwater Monitoring Well MW-4	1	EA	$500.00	$500
Electrical Conduit for Condensate Tank Level Control	1,000	L.F.	$2.00	$2,000
Contingencies (25%)				$20,800
Subtotal:				$103,800
CAPITAL COSTS - REMEDIATION OF DRINKING WATER SUPPLIES				
Installation of JL-100 GAC Filter Systems	71	EA	$1,054.00	$74,800
Installation of JL-300 GAC Filter Systems	21	EA	$1,752.00	$36,800
Pipe Installation	92	L.F.	$286.00	$26,300
Installation of WDNR Approved Pre-Filters	92	EA	$139.00	$12,800
Contingencies (25%)				$37,700
Subtotal:				$188,400
CAPITAL COSTS - IMPLEMENTING ON-SITE INSTITUTIONAL CONTROLS				
Obtaining a Deed Restriction - Groundwater	1	L.S.	$31,800.00	$31,800
Obtaining a Deed Restriction - Water Supplies	1	L.S.		$0
Contingencies (25%)				$8,000
Subtotal:				$39,800
Subtotal of Capital Costs				$557,900
Planning & Permitting (10%)				$55,800
Pre-Design Activities and Engineering Design				$250,000
Construction Oversight (20%)				$111,600
TOTAL CAPITAL COSTS				$975,300

Table 5.1 : Former Junker Sanitary Landfill
Remedial Action Cost Evaluation - Including Annual O&M Costs

Remedial Action: *Excavation of Uncapped Waste; Reconstructing the South Perimeter Ditch; Upgrading Existing Gas Extraction System; Remediation of Drinking Water Supplies; Implementing On-Site Institutional Controls; Existing Cover System Maintenance Operation & Maintenance of Landfill Gas & Leachate Extraction Systems; and Long-Term Monitoring Program*

TASK	QTY	UNIT	RATE	AMOUNT
LONG-TERM OPERATION & MAINTENANCE -Cost per Year				
Assumes a 25% Contingency				
MAINTENANCE OF DRINKING WATER SUPPLY FILTER SYSTEMS - Annual				
Maintenance of JL-100 GAC Filter Systems	71	EA	$228.00	$16,200
Maintenance of JL-300 GAC Filter Systems	21	EA	$447.00	$9,400
Contingencies (25%)				$6,400
Annual Subtotal:				$32,000
PRIVATE WELL SAMPLING - Cost per Sampling Round				
Assumes semi-annual sampling				
Personnel Field Time	80	Hrs	$65.00	$5,200
Personnel Expenses	10	Days	$125.00	$1,300
Laboratory Analytical Services (VOCs)	160	Samples	$150.00	$24,000
Report Preparation	16	Hrs	$65.00	$1,000
Clerical and Accounting	8	Hrs	$45.00	$400
Contingencies (25%)				$8,000
Annual Subtotal:				$39,900
CLAY CAP MONITORING - Cost per Event				
Mowing/Inspection	1	Sum/Year	$3,000.00	$3,000
Contingencies (25%)				$800
Annual Subtotal:				$3,800
GAS EXTRACTION SYSTEM MONITORING - Cost per Monitoring Event (weekly)				
Assume personnel conduct weekly visits (40 weekly visits)				
Project Manager	2	Hrs/Event	$75.00	$6,000
Technician	7	Hrs/Event	$43.00	$12,000
Clerical and Accounting	1	Hrs/Event	$38.00	$1,500
Field Equipment/Expenses	1	Day/Event	$280.00	$11,200
Contingencies (25%)				$7,700
Annual Subtotal:				$38,400

Table 5.1 : Former Junker Sanitary Landfill
Remedial Action Cost Evaluation - Including Annual O&M Costs

Remedial Action: *Excavation of Uncapped Waste; Reconstructing the South Perimeter Ditch; Upgrading Existing Gas Extraction System; Remediation of Drinking Water Supplies; Implementing On-Site Institutional Controls; Existing Cover System Maintenance Operation & Maintenance of Landfill Gas & Leachate Extraction Systems; and Long-Term Monitoring Program*

TASK	QTY	UNIT	RATE	AMOUNT
GAS EXTRACTION SYSTEM MONITORING - Cost per Monitoring Event (monthly/quarterly)				
Assume personnel conduct monthly or quarterly visits and prepare reports (12 events)				
Senior Project Manager	1	Hr/Event	$90.00	$1,100
Project Manager	10	Hrs/Event	$75.00	$9,000
Technician	37	Hrs/Event	$43.00	$19,100
Clerical and Accounting	4	Hrs/Event	$38.00	$1,800
Laboratory Analytical Services (TO-14)	1	Samples/Event	$375.00	$1,500
Laboratory Analytical Services (16 wells plus 2 duplicates)	18	Samples/Event	$145.00	$10,400
Laboratory Analytical Services (condensate tank sample)	1	Samples/Event	$105.00	$400
Field Equipment/Expenses	1	Day/Event	$910.00	$10,900
Utilities/Miscellaneous Parts and Service (annual)	1	L.S.	$3,000.00	$3,000
Contingencies (25%)				$14,300
Annual Subtotal:				$71,500
LEACHATE DISPOSAL - Assume 2,000 gallon disposal every 2 weeks				
Disposal Cost	104,000	Gallons	$0.05	$5,200
Transportation Cost	52	Loads	$300.00	$15,600
Contingencies (25%)				$5,200
Annual Subtotal:				$26,000
TOTAL: LONG-TERM O&M - COST / YEAR				**$211,600**

Table 5.1 : Former Junker Sanitary Landfill
Remedial Action Cost Evaluation - Including Annual O&M Costs

Remedial Action: *Excavation of Uncapped Waste; Reconstructing the South Perimeter Ditch; Upgrading Existing Gas Extraction System; Remediation of Drinking Water Supplies; Implementing On-Site Institutional Controls; Existing Cover System Maintenance Operation & Maintenance of Landfill Gas & Leachate Extraction Systems; and Long-Term Monitoring Program*

TASK	QTY	UNIT	RATE	AMOUNT
LONG-TERM OPERATION & MAINTENANCE -Cost per Year				
Assumes a 35% Contingency				
MAINTENANCE OF DRINKING WATER SUPPLY FILTER SYSTEMS - Annual				
Maintenance of JL-100 GAC Filter Systems	71	EA	$228.00	$16,200
Maintenance of JL-300 GAC Filter Systems	21	EA	$447.00	$9,400
Contingencies (35%)				$9,000
Annual Subtotal:				$34,600
PRIVATE WELL SAMPLING - Cost per Sampling Round				
Assumes semi-annual sampling				
Personnel Field Time	80	Hrs	$65.00	$5,200
Personnel Expenses	10	Days	$125.00	$1,300
Laboratory Analytical Services (VOCs)	160	Samples	$150.00	$24,000
Report Preparation	16	Hrs	$65.00	$1,000
Clerical and Accounting	8	Hrs	$45.00	$400
Contingencies (35%)				$11,200
Annual Subtotal:				$43,100
CLAY CAP MONITORING - Cost per Event				
Mowing/Inspection	1	Sum/Year	$3,000.00	$3,000
Contingencies (35%)				$1,100
Annual Subtotal:				$4,100
GAS EXTRACTION SYSTEM MONITORING - Cost per Monitoring Event (weekly)				
Assume personnel conduct weekly visits (40 weekly visits)				
Project Manager	2	Hrs/Event	$75.00	$6,000
Technician	7	Hrs/Event	$43.00	$12,000
Clerical and Accounting	1	Hrs/Event	$38.00	$1,500
Field Equipment/Expenses	1	Day/Event	$280.00	$11,200
Contingencies (35%)				$10,700
Annual Subtotal:				$41,400

Table 5.1 : Former Junker Sanitary Landfill
Remedial Action Cost Evaluation - Including Annual O&M Costs

Remedial Action: *Excavation of Uncapped Waste; Reconstructing the South Perimeter Ditch; Upgrading Existing Gas Extraction System; Remediation of Drinking Water Supplies; Implementing On-Site Institutional Controls; Existing Cover System Maintenance Operation & Maintenance of Landfill Gas & Leachate Extraction Systems; and Long-Term Monitoring Program*

TASK	QTY	UNIT	RATE	AMOUNT
GAS EXTRACTION SYSTEM MONITORING - Cost per Monitoring Event (monthly/quarterly)				
Assume personnel conduct monthly or quarterly visits and prepare reports (12 events)				
Senior Project Manager	1	Hr/Event	$90.00	$1,100
Project Manager	10	Hrs/Event	$75.00	$9,000
Technician	37	Hrs/Event	$43.00	$19,100
Clerical and Accounting	4	Hrs/Event	$38.00	$1,800
Laboratory Analytical Services (TO-14)	1	Samples/Event	$375.00	$1,500
Laboratory Analytical Services (16 wells plus 2 duplicates)	18	Samples/Event	$145.00	$10,400
Laboratory Analytical Services (condensate tank sample)	1	Samples/Event	$105.00	$400
Field Equipment/Expenses	1	Day/Event	$910.00	$10,900
Utilities/Miscellaneous Parts and Service (annual)	1	L.S.	$3,000.00	$3,000
Contingencies (35%)				$20,000
Annual Subtotal:				$77,200
LEACHATE DISPOSAL - Assume 2,000 gallon disposal every 2 weeks				
Disposal Cost	104,000	Gallons	$0.05	$5,200
Transportation Cost	52	Loads	$300.00	$15,600
Contingencies (35%)				$7,300
Annual Subtotal:				$28,100
TOTAL: LONG-TERM O&M - COST / YEAR				**$228,500**

6.0 CONSTRUCTION QUALITY ASSURANCE PLAN

This Construction Quality Assurance Plan (CQAP) outlines the minimum testing, inspection and documentation requirements that shall be followed by the Contractor and any subcontractors to certify that the construction meets the design specifications for the modifications to the landfill cover and gas extraction system at the former Junker Landfill. Appropriate tests, methods, inspection techniques and resulting construction documentation report are outlined within the subsections that follow. This plan has been developed in accordance with the requirements of Wisconsin Administrative Code Chapters NR 512, 516 and 724.

The components of the design modification included in this CQAP are:

- Additional Gas Extraction Well Installation;
- Additional Gas Header Piping Installation;
- Electrical;
- Sub-base Interim Grading;
- Low Permeability Soil Layer;
- Common Borrow Layer;
- Topsoil;
- Seeding and Mulching;
- Temporary Sediment Controls

Also outlined is the appropriate responsibility and authority organization that will be followed during the construction process.

6.1 DEFINITIONS

Construction Quality Assurance Plan (CQAP): The written document describing the required activities of the Construction Contractor.

Contractor or Construction Contractor: General Construction Contractor employed by the Trust to perform the work per the contract documents.

Contractor's Quality Control (CQC) Manager: The representative of the Construction Contractor who is responsible for the overall compliance with the CQAP and the Contract Documents.

Contract Documents: The specifications (technical and contractual) and drawings which describe and specify the requirements of the Junker Landfill project.

Design Engineer: The party responsible for the design and specification preparation for the construction project. (Dames & Moore)

Manufacturer: Party responsible for the manufacturing of the gas system appurtenance and piping to be installed at the site.

Trust: The Landfill Remediation Trust

Trust's Representative: Person(s) designated by the Trust to represent the Trust, provide construction oversight and other activities.

Quality Assurance (QA): The means and actions employed to assure conformity with the design, manufacture, construction and installation with the quality assurance plan.

Site: The area affected by the work delineated on the plans.

Third Party: Those independent from the Trust, Trust's Representative, Designer, Contractor, or Manufacturer.

6.2 RESPONSIBILITY AND AUTHORITY

The organizations and their respective authority and responsibilities involved with the construction of the modifications to the existing cover and landfill gas extraction system at the Junker Landfill are as follows:

Permitting Agency: It is the responsibility of the permitting agency to review and approve this Construction Quality Assurance Plan. The permitting Agency also has the responsibility and authority to review all Construction Quality Assurance (CQA) documentation during and after construction to confirm this CQAP was followed and that the project was constructed as specified in the design. The permitting Agency is the Wisconsin Department of Natural Resources (WDNR).

Trust: The Trust is responsible for the operations of the project. The Trust will be responsible for retaining the engineering, CQA personnel and the Contractor(s) for the construction of the modification to the cover and landfill gas extraction system at the former Junker Landfill.

Engineer: A registered professional engineer (Engineer), registered in the state of Wisconsin, shall be retained by the Trust to document the modifications to the existing cover and gas extraction system at the former Junker landfill. The engineer or qualified technician under the direct supervision of the Engineer shall be present at all times during critical construction activities. The Engineer may be requested to modify the design if unexpected site conditions are encountered or changes in construction methods occur that could adversely affect the performance of the system. The Engineer will have the responsibility of periodic review of CQA documentation, modifying construction activity, and specifying corrective measures in cases where deviation from the specified design or failure to meet design criteria, plans and specifications are detected by CQA personnel. The Engineer shall review all quality control testing performed by the construction Contractor. The Engineer will ultimately be responsible for certification that the landfill cover and gas extraction system is constructed in accordance with design documents. The engineer or designated qualified technician under direct supervision of the Engineer shall be designated the Construction Quality Assurance (CQA) officer.

CQA Personnel: The CQA personnel is the party, independent of the Contractor(s) and Manufacturers, that will be responsible for performing activities specified in this CQAP. The CQA personnel will include at a minimum a CQA Officer and the necessary supporting CQA inspection personnel.

Construction Contractor: The Construction Contractor(s) will be retained by the Trust. It is the responsibility of the Construction Contractor to construct the final cover and gas extraction system in strict accordance with the design plans and specifications, using the necessary construction procedures and techniques. The Construction Contractor will be responsible for all quality control

testing. Testing shall be performed by an independent testing laboratory approved by the CQA Officer. Results of all tests shall be submitted to the CQA officer for review as work progresses.

6.3 PROJECT MEETINGS

Periodic meetings will be held to ensure that all parties involved with the modifications to the landfill cover and gas extraction system are familiar with the design, construction procedures, design changes and the roles and responsibilities of the CQA Officer, the Contractor, the Design Engineer and the Trust's Representative.

6.3.1 Preconstruction QA Meeting

A QA meeting shall be held prior to the commencement of construction activities. Those required to attend include the CQA Officer, the Contractor, the Design Engineer, and the Trust's Representative. The purpose of the meeting is to:

- Familiarize each party with the CQA Plan and its role and authority relative to the design and construction;
- Review lines of authority and communication for each organization;
- Review sampling, testing and inspection protocol;
- Review protocol for handling construction deficiencies, repairs and retesting;
- Review procedures for the location and protection of equipment and construction materials;
- Review construction schedules and deadlines;
- Inspect existing conditions of the Site; and
- Discuss any additional items required in the Contract Documents.

6.3.2 Problems or Work Deficiency Meetings

Special meetings may be held if a problem or deficiency is present or likely to occur. The meeting may be called by any of the parties involved in the site activities. At a minimum, they should be attended by the Construction Contractor, Design Engineer and Trust's Representative. The purpose of the meeting is to define and resolve construction problems or work deficiencies.

6.4 DOCUMENTATION

All documentation shall be prepared in accordance with this CQAP and the Contract Documents. All documentation must be completed in duplicate. Original copies shall be kept by the CQA Officer. A separate copy shall be submitted to the Trust's Representative.

6.4.1 Sample Documentation

All samples shall be labeled with the following information:

- Project name
- Project location
- Sample identification number
- Sample date
- Sampling time
- Sample type (soil, etc.)
- Sampler's name

All samples shall be logged onto a "Sample Log In" sheet. The Log In sheet entries shall include the following information:

- Sample description
- Tests to be performed on the sample
- Plan sheet designations on which the location of the sample is identified.

All applicable sample locations shall be shown on a construction site plan.

6.4.2 Laboratory Test Documentation

At a minimum, the following information shall be given on test result sheets:

- Sample designation
- Date of sampling
- Date of testing
- Initials of technician performing test
- Test results

- Comments.

6.4.3 Density/Moisture Content Documentation

The following information is the minimum that shall be required on the test documentation for the density/moisture content as applicable:

- Test designation
- Test location
- Date
- Calibration and density count
- Calibration moisture content count
- Measured wet density
- Measured dry density
- Optimum dry density
- Optimum moisture content
- Percent compaction
- Test status (pass or fail)
- Depth of measurement
- Test method
- Initials of technician performing test

All sample locations shall be shown on a construction site plan. The test method for the in-place density and moisture content analysis shall be the nuclear method (ASTM 2922).

6.4.4 Inspection Documentation

Visual inspection required for approval of a constructed component of the landfill cap shall be documented by the Contractor. At a minimum, the following information shall be documented:

- Inspector's name
- Date
- Time
- Component inspected
- Deficiencies in construction
- Corrective action taken

- General comments
- Photos taken during inspection.

6.4.5 Daily Logs

The Engineer shall keep a daily journal of the site construction activities. Each daily entry to the journal shall contain the following information:

- Date
- Contractor's name
- Weather conditions
- Construction activities
- List of photographs taken
- List of samples collected
- List of tests performed
- List of test results received
- Record of all forms filled out during the day.

6.4.6 Photographs

Photographs shall be taken to aid in documenting clay placement along the south perimeter ditch, regrading of subsidence areas and installation of additional gas extraction wells, inspections, sampling events and field tests. Photographs shall not be used as sole documentation of activities. The Trust's Representative shall retain all originals and copies.

6.4.7 Construction Plans

Site construction plans shall be utilized to show the locations of samples taken, tests performed, and defects found during construction inspections as specified. The construction plans shall be at an appropriate scale to show the recorded information clearly. Where possible, dimensions to known monuments or coordinates shall be provided. Sample or test locations shall be clearly labeled with the sample or test number.

6.5 SUBGRADE CONSTRUCTION

The subgrade consists of the finished surface of the waste plus additional common borrow to the grades indicated on the cross-sectional plan sheets.

6.5.1 Construction Activities

Activities included as part of subgrade construction include clearing and grubbing of the existing landfill surface; stripping and stockpiling of existing cap materials and topsoil; grading of the subgrade to the lines and grades shown on the cross-sectional plan sheets; replacement of the clay cap in the newly regraded areas to the grades shown on the cross-sectional plan sheets; replacement of the fill soils to the grades shown on the proposed grading and cross-sectional plan sheets; and trenching and backfill for the additional gas extraction wells in accordance with the Design Plans and Construction Specifications.

The subgrade shall be prepared, compacted and proof rolled in accordance with Section 02211of the Construction Specifications before replacement of the cover system. The rolling of the subgrade shall be monitored by the Trust's Representative to ensure that there is no excessive deflection or excessive rebound as the roller passes over the subgrade.

Any subgrade material not meeting the specifications of the design or the CQAP shall be removed and recompacted. The Contractor's surveyor shall verify final subgrade elevations will be measured to a limit of one inch plus or minus of the subgrade elevations shown on the interim grading plan and specified in the Contract documents. The Contractor shall submit to the Trust's Representative the final interim grading plan showing the actual grades and elevations of the subgrade. This plan shall be certified by a Wisconsin Registered Land Surveyor.

CQA personnel will perform visual inspections to determine that there are no moisture seeps and that all soft, organic and otherwise undesirable material are removed; that no protrusions exist that would inhibit the replacement of the low permeability cap; and that no ponding or low areas are present.

The Contractor shall conduct all work necessary for completion of the subgrade. Visual observations shall be documented by CQA personnel on a daily field log and incorporated into the final

documentation report. Prior to the placement of the clay cap, the subgrade will be visually inspected for desiccation, cracks, protrusions, ponding or other features that may inhibit the replacement of the cap. Visual observations and repairs shall be documented by CQA personnel on a daily field log and incorporated in the final construction report.

6.5.2 Certification

Upon inspection and approval of the subgrade, the CQA officer shall prepare a certification report that contains the following information:

- Inspection results
- Deviations of the construction from the Contract Documents
- Record drawings with interim grades and any necessary details
- A notarized statement attesting to the accuracy and completeness of the certification report

6.6 GAS EXTRACTION SYSTEM INSTALLATION AND MODIFICATION TO EXISTING LEACHATE EXTRACTION WELL

There will be three additional gas extraction wells added to the 18 existing wells. The new wells will be installed to depths of 50 to 60 vertical feet below the landfill surface. The gas wells are connected via a six inch HDPE header pipe to the existing blower and will have the capability to pump leachate or landfill gas. In addition, one piston pump will be installed in the existing leachate extraction well, LEW-1.

6.6.1 Pre-Construction Requirements

The manufacturer will provide the Contractor with the design information which include illustrations, specifications and engineering data such as

- Fabrication, assembly, installation and wiring diagrams
- Operation and maintenance manual for the well head assemblies and leachate pumps, including electrical control information.

Conformance testing will be carried out by the manufacturer to demonstrate that the products meet the requirements of the specifications. The Contractor is responsible for the inspection of all

products to ensure that they are free of defects in material and workmanship and verify the compatibility of the products.

The Contractor shall provide the CQA Officer with all conformance testing results, inspection and certified copies of the manufacturer's data. All appropriate data will be included in the final construction documentation report.

6.6.2 Construction Activities

All products will be installed as shown on the Design Plans and as described in Sections 02221, 15675, and 15680 of the construction specifications. The CQA personnel will perform visual inspection to determine that any defective or broken products are removed from the site. If installed, the defective or broken products shall be removed and replaced at the Contractors expense. All inspections made by CQA personnel will be documented on a daily field log and incorporated into the final construction documentation report.

6.6.3 Certification

The Contractor and CQA Officer will make the final inspection to determine that the gas extraction system was installed in accordance with the Design Plans and construction specifications and is in good working condition. The CQA Officer shall prepare a certification report that contains the following information:

- Inspection documentation
- Deviations of the construction from the Contract Documents
- A notarized statement attesting to the accuracy and completeness of the certification report.

6.7 PIPING, VALVES, WELLS AND APPURTENANCES

Piping, valves and appurtenances shall correspond to the installation of all additional items required for the operation of the gas extraction system included in Section 15675, 15677, and 15680 of the construction specifications.

6.7.1 Pre-Construction Requirements

The Contractor is responsible for inspecting all products to ensure that they are free of defects in material and workmanship and verifying the compatibility of the products.

6.7.2 Construction Activities

All products will be installed as shown in the Design Plans and described in Sections 02221 and 15680 of the construction specifications. The Contractor shall provide the services of a competent manufacturers installation specialist if necessary. The specialist shall remain on the job until the competency of the pipe and well crew has been satisfactorily demonstrated.

All gas extraction wells, leachate pumping systems, header pipe trenches, and piping system shall be constructed to the elevations shown on the Design Plans and as described in Sections 02221, 15675, 15677 and 15680 of the construction specifications. The Contractor shall provide personnel knowledgeable in the installation of wells and piping specified in the Design Plans.

The Contractor's surveyor shall verify final elevations of the top of pipe and appurtenances shall be measured to 0.1 inch plus or minus of the elevations shown on the Design Plans.

The CQA personnel will check to verify all piping valves and appurtenances installed are as specified or as approved by the CQA officer. The CQA personnel will perform visual inspections to determine that any defective or broken products are removed from the site. If installed, the defective or broken products shall be removed and replaced at the Contractors expense. Construction activities will be recorded by CQA personnel on a daily field log and will be incorporated into the construction documentation report.

6.7.3 Certification

The Contractor and CQA Officer will make a final inspection to determine that the wells, piping system, valves and appurtenances were installed in accordance with the Design Plans and construction specifications and are in good working condition.

The final inspection shall be documented by the CQA Officer on the daily field log. The CQA Officer shall prepare a certification report that contains the following information:

- Inspection documentation
- Deviations of the construction from the Contract Documents
- A notarized statement attesting to the accuracy and completeness of the certification report.

6.8 LOW PERMEABILITY SOIL LAYER (CLAY CAP)

Immediately above the subgrade and beneath the rooting zone and topsoil shall be a 24-inch layer of compacted low permeability soil.

6.8.1 Pre-Construction Requirements

Soil must be approved in accordance with Wisconsin Administrative Code Chapters NR 504 and 506. Conformance testing will be carried out by the Contractor to demonstrate that the materials meet the requirements on the construction specifications.

6.8.2 Construction Activities

The fine-grained low permeability soil cap installation and testing shall be in accordance with Sections 02211 and 02220 of the construction specifications. These specifications are based, in part, on the requirements in NR 516.

One Modified Proctor moisture-density curve (ASTM D1557) shall be developed for every 300 cubic yards (CY) or less of material placed and for each major soil type utilized. At least five points shall be established on each curve. A representative sample for every 300 CY or less of material placed shall be analyzed for grain size distribution through the No.200 sieve (ASTM D422) and for Atterberg limits (ASTM D4318). If apparent changes in the soil quality are observed during material placement, a one-point Proctor analysis shall be utilized to verify the applicability of previously analyzed moisture density curves.

Dry density and as-placed moisture content shall be measured by the nuclear method (ASTM D2922) on an approximate 100-foot grid pattern for each one-foot thickness of soil restored on the landfill surface. For soil placed along the south perimeter ditch, dry density and as-placed moisture content shall be measured every 20 feet. A minimum of 5 such sets of tests shall be performed. A minimum of 2 density and moisture tests shall be performed to fully define the degree of soil compaction obtained in confined areas where equipment movement is hindered or hand compaction is necessary.

A minimum of one undisturbed sample for every one-foot thickness of fine-grained low permeability material placed shall be retrieved and analyzed for Atterberg limits, grain size passing the No.200 sieve, moisture content and dry density. A laboratory hydraulic conductivity test using the falling head method (ASTM D5084) shall be performed on at least one undisturbed sample.

If the tests indicate that the in-place material does not meet required specifications, the material will be reworked or removed and replaced by the Contractor. Results of the testing will be submitted to the CQA Officer for review as the work progresses. All test results will be included in the final construction documentation report. Test results will be recorded on the appropriate moisture testing performed. Each plan view will also clearly show any areas where removal and/or recompaction of the material was necessary to attain the minimum required specifications.

The Contractor's surveyor shall verify that low permeability soil elevations will be measured to a limit of 0.1 foot plus or minus of the grades required by the design plan. The soil layers shall be protected from rain, drying, desiccation, erosion and freezing by placing the fill and topsoil layers as soon as possible after acceptance.

Any areas that become defective shall be reworked and retested by the Contractor. Observations, repairs and additional tests will be documented and included in the final construction documentation report.

6.8.3 Certification

Upon completion of the low permeability soil layer, the CQA officer shall prepare a certification report that contains the following information:

- Results of all testing

- Deviations of the construction from the Contract Documents
- Record drawings with field test locations and results and any necessary details
- A notarized statement attesting to the accuracy and completeness of the certification report.

6.9 PROTECTIVE COVER AND TOPSOIL PLACEMENT

The final layers of the cover system shall be composed of 36 inches of soil having properties necessary to establish a lush vegetative cover and promote evapotranspiration.

6.9.1 Material Description

The Trust's Representative shall approve the borrow source for the topsoil layer prior to use in construction, if additional material is deemed necessary for completion of the protective cover and topsoil at the site. Approval shall be based on conformance with the Contract Documents.

The Trust's Representative shall inspect the borrow material and topsoil as it is delivered and spread to ensure that it is free of large rocks, branches or any other material that may damage the underlying barrier layer.

The borrow material shall be sampled at a rate of one sample per 1000 CY of soil placed for grain size analysis (ASTM D422) and for Modified Proctor Density (ASTM D1557).

6.9.2 Construction Activities

No common borrow shall be installed until the clay barrier of the final cover has been approved by the Engineer and/or Trust's representative. The Trust's Representative shall monitor placement and compaction of the vegetative layer to ensure that the clay barrier is not damaged.

The Contractor's surveyor shall verify that 30 inches of common borrow and 6 inches of topsoil have been installed to the correct elevations and grades. Thickness tests of the layers shall be performed in a manner that does not harm the clay barrier layer of the cover. The final elevations of the protective cover layer and the topsoil layer will be measured to a limit of 0.1 inch plus or minus of the elevations shown on the Design Plans. The Contractor shall submit verification from a Wisconsin

Registered Surveyor documenting that the proper thicknesses for each layer and correct elevations and grades exist.

6.9.3 Certification

Upon completion of the installation of the common borrow and topsoil layers, the Contractor shall prepare a certification report that contains the following information:

- Results of all testing
- Any deviations of the construction from the approved Contract Documents
- Record drawings with final grades and any necessary detail
- A notarized statement attesting to the accuracy and completeness of the certification report.

6.10 SEEDING AND MULCHING

The final cover and other areas as specified, shall be seeded and mulched to establish a dense vegetative cover.

6.10.1 Material Approval

The CQA Manager and the Trust's Representative shall approve the seed mixes before use. Approval shall be based on conformance with the Contract Documents.

The CQA Manager and the Trust's Representative shall approve the erosion control devices before use. Approval shall be based on conformance with the Contract Documents.

6.10.2 Construction Approval

The Trust's Representative shall inspect the topsoil surface to ensure that it is loose and friable at the time of seeding. The Trust's Representative shall monitor seeding and mulching to ensure that complete and even coverage is provided. The Trust's Representative shall inspect the placement of erosion control devices to ensure that its placement is in accordance with the Contract Documents. The Trust's Representative shall inspect the site once every two weeks until vegetation is firmly

established over the site. Erosion or washout shall be reported to the Trust or Contractor immediately so that the appropriate repairs can be made.

6.10.3 Certification

Upon establishment of dense vegetation over the entire landfill as determined by the Trust's Representative in accordance with the Contract Documents, the CQA Manager shall prepare a report that contains the following information:

- Inspection documentation
- Any deviations of the construction from the Contract Documents
- A notarized statement attesting to the accuracy and completeness of the certification report.

6.11 TEMPORARY SEDIMENT CONTROLS

Temporary controls shall be placed during construction to minimize the transport of sediment by surface water runoff to natural waterways.

6.11.1 Construction Approval

The Trust's Representative shall monitor the installation of silt fencing to ensure it is adequately staked and anchored.

The Trust's Representative shall inspect the temporary erosion control devices after every precipitation event and at least once every two weeks for the duration of the project, to ensure that they are functioning correctly and are not becoming eroded. If problems are discovered, they will be reported to the Trust and Contractor so that corrective measures can be implemented.

APPENDIX A
BID DOCUMENTS - JUNKER LANDFILL PROJECT

BID DOCUMENTS
LANDFILL GAS MIGRATION CONTROL SYSTEM
FORMER JUNKER SANITARY LANDFILL
TOWN OF HUDSON, ST. CROIX COUNTY, WISCONSIN

April 1997

Dames & Moore No. 33178-002

BID DOCUMENTS
LANDFILL GAS MIGRATION CONTROL SYSTEM
FORMER JUNKER SANITARY LANDFILL
TOWN OF HUDSON, ST. CROIX COUNTY, WISCONSIN

TABLE OF CONTENTS

SECTION I

INSTRUCTION TO BIDDERS

I-1 BID PREPARATION

One copy of the Bid shall be submitted in a sealed envelope marked as a Bid Document. The Bid Form shall be typewritten or written in ink. Bids are solicited for the scope of Work in its entirety. All Work is to be performed in accordance with the Contract Documents. Exceptions and/or clarifications shall be covered in a separate letter attached to the basic Bid.

I-2 BID SUBMITTAL

Bidder is solely responsible to ensure that its Bid is submitted to ENGINEER by 4:00 pm on Thursday, May 1, 1997, unless subsequently modified by addenda. Bids will be received at the following address and then privately opened:

DAMES & MOORE
2701 International Lane, Suite 210
Madison, WI 53704

Attention: Julie Hoffman

Bid for Contract No. 33178-002

Landfill Remediation Project
Former Junker Sanitary Landfill
Hudson, WI 54016

To insure against premature opening prior to Bid time, it is requested that the Bid forms and supporting documents be sealed in an inner envelope and clearly marked. Bids received after the Bid closing time may be subject to disqualification.

Faxed bids will not be accepted.

I-3 BIDDER RESPONSIBILITY

Bidder is responsible for making a full examination of the Contract Documents, including all addenda, and for becoming thoroughly familiar with all existing and expected conditions which could affect performance of the Work. Failure to do so will be at the sole risk of Bidder.

Should Bidder find that the Contract Documents contain discrepancies, omissions, unclear or ambiguous language, or should any other questions arise, Bidder shall promptly notify ENGINEER. Such notification shall be confirmed in writing. Should time be insufficient for ENGINEER to provide an answer in the form of an addenda and should Bidder consider the matter important as to have a bearing on its Bid, Bidder shall stipulate it in a letter of clarification submitted with its Bid. The submission of a Bid shall constitute an acknowledgment that the Bidder is aware of the conditions to be encountered at the Site and of the requirements for performing the Work.

I-4 MODIFICATION AND WITHDRAWAL OF PROPOSAL

Bidder may withdraw its Bid up to the time of Bid. Following withdrawal, Bidder may submit a new Bid, as long as it is received prior to the time of Bid. Telecopy Bids will not be considered, but modifications by FAX or in writing will be considered if received prior to the time set for opening. Telephone and/or oral requests to modify a Bid will not be considered. Bids shall be firm for 90 calendar days after the Bid closing date. Negligence or mistakes on the part of the Bidder in preparing its Bid confers no right of withdrawal after the Bid closing time.

I-5 CONTRACT AWARD

Contract will be awarded to the Bidder whose Bid is most advantageous to OWNER with all factors considered. OWNER reserves the right upon its sole discretion and judgment, to reject any or all Bids and to waive any irregularity in the Bids received. Within 10 calendar days of receipt of Contract for execution, the successful Bidder shall execute the Contract and provide the required certificate of insurance, performance and payment bonds, and return these executed documents to the OWNER for review and processing. Failure by Bidder to properly execute the Contract and provide the required certification and bonds as specified shall be considered a breach of Contract by Bidder. OWNER shall then be free to terminate the Contract in accordance with Article GC-32.0, "TERMINATION FOR DEFAULT" or, at OWNER's option, release CONTRACTOR and be free to award the Contract to another Bidder.

I-6 RETURN OF DOCUMENTS

Unsuccessful Bidders shall return all Contract Documents received for bidding purposes to the address given above for receipt of Bids.

I-7 TECHNICAL AND COMMERCIAL QUESTIONS

Questions of a technical and commercial nature may be submitted in writing by mail or telecopy and directed to:

DAMES & MOORE
2701 International Lane, Suite 210
Madison, WI 53704

Attention: Julie Hoffman

(608) 244-1788 (phone)
(608) 244-7823 (fax)

I-8 EXCEPTIONS TO CONTRACT DOCUMENTS

If exceptions are not itemized by Bidder, it is assumed that the Bidder's quotation conforms in all respects with the Contract Drawings and conditions of the Request for Bid.

I-9 BID DOCUMENT SIGNATURES

Bidder will sign Bid documentation on page 2 of Section P-1. Bidder will also initial each page of Section P at the bottom left. Any cross-outs on any of the Section P pages will also be initialed.

P-1 BID LETTER

To: Dames & Moore
2701 International Lane, Suite 210
Madison, WI 53704

For: Landfill Remediation Project
Former Junker Sanitary Landfill
Hudson, Wisconsin 54016

Subject: LFG Migration Control

The undersigned hereby proposes to enter into a Contract for the performance of the Work which will be performed in accordance with the provisions of Contract No. 33178-002. If awarded, said Work will be performed in accordance with the provisions of the Contract as modified by any special provisions or clarifications accompanying this Bid and at the prices set forth for each item herein below:

Bidder's Initials_____

SECTION P

BID

Attached hereto and made a part of the Bid, by reference, are the following documents:

P.1	Bidder's Proposed Key Personnel Listing and Resumes
P.2	Bidder's List of Proposed Subcontractors and Vendors
P.3	Bidder's Proposed Equipment Listing
P.4	Bidder's Experience Documentation

Bid Date: May 1, 1997

_____
Company

_____
Signature*

_____
Type or Print Name

_____
Title

_____
_____
_____
_____
_____
Bidder's Address and Phone Number

_____
Bidder's State of Incorporation

_____
Bidder's Contracting License Number

_____
License Expiration Date

*Evidence of the authority of the person signing in behalf of a corporation, partnership or joint venture shall be attached to this Bid.

Bidder's Initials_____

P.1 KEY PERSONNEL LISTING AND RESUMES

Attached hereto are the key personnel we propose to manage the Work. They include the following:

_____
Project Manager

_____
Project Engineer (if applicable)

_____
Project Business Manager

_____
General Superintendent

Notate who will be the primary contact on-site and in the home office:

* Office Contact
** Site Contact

NOTE 1: If titles shown above are not appropriate, please adjust as needed.

Bidder's Initials_____

P.2 LIST OF PROPOSED SUBCONTRACTORS AND VENDORS

A. If awarded the Contract, Bidder proposes to subcontract the following Work. If no subcontract Work is proposed, Bidder shall so state.

Description of Subcontracted Work	% of Contract	Proposed Subcontract

B. If awarded the Contract, Bidder proposes to purchase major items of equipment and materials from the following Vendors (Suppliers). If none is proposed, Bidder shall so state.

Description of Major Equipment and Materials	% of Contract	Proposed Vendors

NOTE: Use additional sheets if necessary

Bidder's Initials_____

P.3 BIDDER'S PROPOSED EQUIPMENT LISTING

A. The Bidder proposes to use the following equipment for this project:

Description	No. PCS Available	Date Available On-site	Remarks

Bidder's Initials_____

NOTE: Use additional sheets if necessary.

P.4 BIDDER'S EXPERIENCE DOCUMENTATION

Bidder will list below previous experience including at least three references of completed or in-progress projects. Also one reference each of banking, bondings and insurance will be submitted. Bidder is encouraged to attach their formal qualifications and corporate brochures to this Bid.

1.

2.

3.

4.

5.

6.

Bidder's Initials_____

SECTION 1

AGREEMENT

CONTRACT NO. 33178-002

Landfill Remediation Trust, hereinafter called OWNER, and _____, hereinafter called CONTRACTOR, enter into Contract No. 33178-002 with a Contract Price of $_____, and an effective date of _____, 1997.

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

CONTRACTOR, in consideration of the payment to be made by OWNER agrees to perform the Work specified in Contract No. 33178-002 in strict accordance with the Contract Documents and any changes thereto. The Contract Documents include this Agreement and the following listed attachments which are hereby referred to and by reference made a part of the Contract, as fully and completely as if the same were fully set forth herein.

Sections incorporated:

2. SCHEDULE OF CONTRACT PRICES AND PAYMENT
3. BIDDER'S PROPOSED PERFORMANCE SCHEDULE
4. CONTRACT GENERAL CONDITIONS
5. TECHNICAL SPECIFICATIONS
6. DRAWINGS

OWNER in consideration of the Work to be performed by CONTRACTOR in strict accordance with the Contract, agrees to pay CONTRACTOR on the basis of "SCHEDULE OF CONTRACT PRICES AND PAYMENT."

Mutually, the parties agree that this Contract shall be binding upon themselves, and shall inure to the benefit of the successors or assigns of OWNER and the successors, heirs, or legal representatives of CONTRACTOR.

This Agreement comprises a final and complete repository of understandings between the CONTRACTOR and the OWNER. It supersedes all prior or contemporaneous communications, representations, or agreements, whether oral or written, relating to the subject matter of this Agreement. You are advised to read this document thoroughly before accepting it to help assure it accurately conveys meanings and intents. Acceptance of this Agreement as provided signifies that you have read the document thoroughly and have had any questions or concerns completely explained by independent counsel and are satisfied.

OWNER

Landfill Remediation Trust
c/o Dames & Moore
2701 International Lane, Suite 210
Madison, WI 53704

Signature

Title

Date

Attest by

Seal

CONTRACTOR

Firm Name

Address

Signature

Date

Attest by

Seal

SECTION 2

SCHEDULE OF CONTRACT PRICES AND PAYMENTS

Former Junker Landfill

Excavation of Waste, Regrading South Perimeter Ditch, and LFG Migration Control

BID ITEMS

Section	Bid Item	Quantity	Unit Price	Bid Price
01505	1. Mobilization/Demobilization	L.S.		$
01505	1a. Performance & Payment Bond	L.S.		$
02110	2. Site Clearing and Grubbing	2.1 acre	$	$
02110	3. Topsoil Stripping & Stockpiling	1700 cy	$	$
02211	4. Stripping Cover Soils and Clay Cap	15300 cy	$	$
02221	5. Excavation of Waste	1500 cy[A]	$	$
02220	6. Placement of Waste in Subsidence Areas	1500 cy[A]	$	$
02221	7. Backfill Excavated Volume (clean granular fill)	1500 cy[A]	$	$
02221	8. On-site Disposal of Drummed Soils	25 Drums	$	$
02220	8. Replacing and Compacting Clay	5100 cy	$	$
02220	9. Replacing Cover Soils (rooting zone)	8500 cy	$	$
02220	10a. Offsite Borrow Clay	1700 cy	$	$
02920	10b. Replace Salvaged Topsoil	1700 cy	$	$
15680	11. Lateral Pipe Installation	460 lf	$	$
15677	12. Repair of MW-4	L.S.		$
15675	13. LFG Extraction Wells	3 @ 65 vlf ea	$	$
15680	13a. Wellhead Assemblies	3 ea	$	$
15680	13b. Protective Structures Around Wellheads - for Leachate/Gas Wells	2 ea	$	$
15680	13c. Protective Structure Around Wellhead - for Gas Well	1 ea	$	$
15677	13d. Leachate Pumps	3 ea	$	$
15677	13e. Protective Cover on LEW-1	1 ea	$	$
15677	14a. Lateral Pipe Inspection	455 lf	$	$
15677	14b. Vacuum Monitoring Ports	4 ea	$	$
15680	15. Abandon Passive Gas Venting System	L.S.		$
02211	16. Regrading South Perimeter Ditch	L.S.		$
02920	17. Place Imported Topsoil	100 cy	$	$
16010	18. Electrical	L.S.		$
02920	19. Site Cleanup and Restoration	L.S.		$
			CONTRACT AMOUNT:	$

Notes: ^ Waste excavated in quantities greater than shown on Bid Table shall be handled as an Extra.

1. Contract Amount is for convenience of comparing Bids.
2. Quantities shown above are for CONTRACTOR'S convenience only and may not represent actual quantities at the Site.

Bidder's Initials_____

This Section is subject to all terms and conditions here attached.

The undersigned agrees upon receipt of Notice of Acceptance of this Bid to execute a Contract in accordance with this Bid and to furnish Certificate of Insurance and good and sufficient bonds for the faithful performance of the Contract, within 10 calendar days after the forms are presented for signature. It is agreed that the accompanying specimen Agreement form, and referenced attachments, the terms and conditions of which are acceptable, is the form to be used in the preparation of the Contract subject to modification to conform with the special provisions or clarifications accompanying this Bid, if any.

The undersigned certifies that it has examined and is thoroughly familiar with the Site, the conditions under which the Work is to be accomplished and the Contract Documents, including the following addenda:

_____
_____
_____
_____

The undersigned certifies that this Bid will not be withdrawn for 90 calendar days after the Bid closing date.

The undersigned further agrees that, if awarded Contract No. 33178-002, it will commence Work within 5 calendar days following issue of Notice to Proceed. Bidder understands that time is of the essence for this Contract and that it will fully complete the Work within the time limits required by the specified milestone dates.

_____
Company

_____
Signature

Bidder's Initials_____

SECTION 3

BIDDER'S PROPOSED PERFORMANCE SCHEDULE

Attached hereto is Bidder's proposed schedule for performing the Work. The schedule complies with the completion date established by Specification Section 01002, Paragraph 1.11. Variations in compliance, if any, with the above are specifically noted on the submitted schedule.

(Use additional sheets if necessary)

Project Startup	June 15, 1997
Project Substantial Completion	July 15, 1997
Project Final Acceptance	July 30, 1997

Bidder's Initials_____

SECTION 4

CONTRACT GENERAL CONDITIONS

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GC-1.0 DEFINITIONS

Standard terms used throughout this Contract shall have the meanings hereby assigned to them:

1.1 The term "Agreement" shall mean the written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

1.2 The term "Contract" shall mean the Contract entered into by OWNER and CONTRACTOR, including all of the Agreement and other Contract Documents, and any subsequent Contract Change Agreements signed by both OWNER and CONTRACTOR.

1.3 The term "Contract Change Agreement" shall mean the document signed by CONTRACTOR and OWNER to amend the Contract to provide for changes or extra Work.

1.4 "Contract Documents" shall mean the Agreement, Bonds, General Conditions, Special Conditions, Specifications, Drawings, Scope, Schedule of Payment, Performance Schedule, Health and Safety Plan, Waiver of Risk and Release of Liability, and the Final Release and Waiver of Lien as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements.

1.5 The term "CONTRACTOR" shall mean the corporation, company, partnership or individual bound by this signed Contract and who will perform the Work specified in this Contract.

1.6 The term "Contract Price" shall mean the Price, taking effect at the time of execution of the Contract.

1.7 "Defective" is an adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER'S recommendation of final payment (unless responsibility for one protection thereof has been assumed by OWNER at Substantial Completion).

1.8 "CONTRACTOR Submittals" shall mean Shop Drawings, samples, manufacturer's data sheets and all other Submittals required by the Contract Documents to be submitted to the ENGINEER for review.

1.9 "Drawings" shall mean the Drawings which show the character and scope of the Work to be performed and are referred to in the Contract Documents.

1.10 The term "ENGINEER" shall mean DAMES & MOORE, a Delaware Corporation with offices at Madison, Wisconsin.

1.11 The term "Final Acceptance" shall mean written Final Acceptance of the Work issued by OWNER following 100 percent completion of the Work by CONTRACTOR and inspection by OWNER and ENGINEER.

1.12 The term "Final Total Contract Price" shall mean the final total Price paid by OWNER to CONTRACTOR after accounting for the effect of Contract Change Agreements, liquidated damages or Contract assessments, backcharges and changes in estimated quantities.

1.13 The term "Mechanical Acceptance" shall apply to any unit of equipment or separable portion of the Work which, following mechanical checkout, testing, and correction of deficiencies detected during testing is found, in the sole judgment of OWNER to operate in conformance with this Contract.

1.14 The term "OWNER" shall mean Landfill Remediation Trust.

1.15 The term "Project Performance Schedule" (PPS) shall mean the time spans within which OWNER and CONTRACTOR have agreed that the Work is to be commenced, performed and completed, and in the sequences stipulated therein.

1.16 Wherever the term "Resident Project Representative" (RPR) is used within the Contract Documents, it shall mean the duly authorized engineering representative(s) of the ENGINEER or OWNER.

1.17 "Shop Drawings" shall mean all Drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedule, performance charges, instructions, diagrams and other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

1.18 The term "Site" shall mean the land provided by OWNER under, in or through which the Work is to be performed.

1.19 "Special Conditions" - The part of the Contract Documents which amends or supplements these General Conditions.

1.20 "Specifications" those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

1.21 The term "SUBCONTRACTOR" shall mean any person or firm contracting with CONTRACTOR, including his/its employees, agents and representatives to perform Work for CONTRACTOR.

1.22 The term "Work" shall mean the various obligations of performance CONTRACTOR including, but not limited to, providing all materials, supplies, equipment, small tools, supervision, labor, and services, if any, as set forth by the Contract Documents either expressly or implied, or the tangible product to CONTRACTOR'S efforts, as contextually appropriate.

1.23 "Work Directive Change" is a written directive to CONTRACTOR, issued on or after the effective date of the Agreement by OWNER, ordering an addition, deletion or revision in the Work. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Agreement following negotiations by the parties as to its effect.

GC-2.0 ENTIRE AGREEMENT

This Contract sets forth the entire agreement between OWNER and CONTRACTOR and supersedes all prior negotiations, proposals, letters of intent or preliminary Contract drafts. This contract shall be interpreted and construed under the laws of the State of Wisconsin.

GC-3.0 SEVERABILITY

If any portion of the Contract is invalid, illegal or contrary to law, that portion shall be stricken and the remainder of the Contract shall remain unaffected.

GC-4.0 DESIGNATION OF REPRESENTATIVES

CONTRACTOR shall designate in writing a representative having the delegated authority to contractually commit CONTRACTOR on all matters. Said representative shall be on the Site or available at all times when Work is actually in progress. CONTRACTOR'S representative shall communicate on all matters, including all engineering questions, through RPR, who will also be designated in writing.

GC-5.0 INDEPENDENT CONTRACTOR

CONTRACTOR is an independent CONTRACTOR and shall maintain complete control of and responsibility for its employees, agents, methods and operations.

Whenever in the Specifications the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory," or adjectives of like effect or import are used to describe request, requirement, direction, review, or judgment of OWNER, it is intended that such requirement,

3.0 PROJECT CONSTRUCTION AND OPERATION SCHEDULE

Figure 3.1 shows the schedule that has been and will continue to be implemented for the remainder of the project.

The construction schedule will begin with a public bid of the project for a period of approximately three weeks during May 1997. The first phase of construction for installation of the gas extraction wells and supporting header pipe will begin in June 1997; excavation of the uncapped waste will begin after the wells and lateral pipe are installed in late June 1997; the reconstruction of the south perimeter ditch will begin in July 1997, providing location of future wells and pipe laterals do not interfere with waste placement.

direction, review, or judgment will be solely to evaluate the goods and services for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that OWNER shall have authority to supervise or direct any of CONTRACTOR'S operations or activities.

GC-6.0 PERFORMANCE AND PAYMENT BOND (if required)

CONTRACTOR shall furnish performance and/or payment bonds each in the full amount of the Contract, less the bond premium. Bonds shall be furnished within 10 calendar days of receipt of Contract for execution and in any event prior to the start of Work. Bonds shall be in such form and with such sureties as may be acceptable to OWNER.

GC-7.0 NOTICE TO PROCEED

CONTRACTOR shall not commence Work until written Notice to Proceed is issued by OWNER. Following said issue, CONTRACTOR shall commence Work within 5 calendar days. Time is of the essence in the performance of this Contract.

GC-8.0 CONTRACTOR'S RESPONSIBILITY

CONTRACTOR shall have complete responsibility for performance of the Work in accordance with the Contract Documents. This responsibility includes providing all items and services necessary to perform and/or complete the Work even though not specifically mentioned in the Contract but which are necessary to accomplish the Work.

GC-9.0 COMPLIANCE WITH LAWS AND REGULATIONS

CONTRACTOR and its employees shall at all times observe and comply with all applicable laws, regulations, and codes of the United States and of any state or political subdivision having jurisdiction of the place where any Work hereunder is accomplished. All costs of this compliance shall be borne by the CONTRACTOR without additional compensation.

GC-10.0 SEPARATE CONTRACTS

CONTRACTOR may be one of several working at the Site and shall cooperate fully, plan and perform the Work hereunder in a manner that will not interfere with the operations of other CONTRACTORS, ENGINEER, or those of OWNER. OWNER will establish priorities and resolve interferences. No extra compensation will be allowed due to interference between CONTRACTORS.

GC-11.0 SUBCONTRACTS, ASSIGNMENTS AND LIENS

CONTRACTOR shall not subcontract or assign any part of the Work without OWNER'S prior written approval. CONTRACTOR shall promptly pay its bills and employees wages and shall not permit a lien or claim to be attached to the Work or Site. Should any claim or suit for collection be brought by CONTRACTOR'S employees, SUBCONTRACTORS, or Suppliers, CONTRACTOR shall promptly procure a release of the claim or lien and hold OWNER and ENGINEER harmless from all costs and incidental expenses. At OWNER'S option, OWNER shall have the right to discharge such liens and assess all costs against CONTRACTOR to the fullest extent permitted by law. CONTRACTOR hereby waives and releases all liens or rights to any and all liens upon the Work or Site. Further, to the fullest extent provided by law, CONTRACTOR shall require each and every SUBCONTRACTOR to execute a waiver and release of SUBCONTRACTOR'S liens or rights before commencing Work.

GC-12.0 ACCOUNTS AND RECORDS

For any Work performed on a cost-reimbursable basis, CONTRACTOR shall keep full and detailed costs in a form acceptable to OWNER. OWNER shall have full access to audit such records. The records shall be retained for a period of 3 years after Final Acceptance, or for the period required by the Consent Decree or Remedial Action Plan, whichever is longer.

GC-13.0 CONTRACT PAYMENTS

OWNER will make partial payments as the Work progresses. Payment will be made based upon invoices prepared for Work performed during the preceding month, all in accordance to Section 2 of the Contract documents, approved by OWNER, and

submitted on or about the 25th day of each calendar month. OWNER shall have the right to require reasonable backup documentation and lien waivers for the full amount of each invoice as it may deem necessary as a condition of payment. Payment for materials delivered to the Site but not incorporated into the Work will be made at 90 percent of the certified Vendor invoice cost, less retention, unless otherwise specified. Upon payment, title to such materials shall pass to the OWNER. Ten percent retainage will be withheld from each progress payment
based upon the total-to-date earned amount. To the extent approved, payment will be made by OWNER within 30 calendar days after receipt of invoice.

OWNER may withhold payment from CONTRACTOR for any of the following reasons: Defective Work not remedied; backcharges, damage to other CONTRACTORS, ENGINEER, or OWNER; failure to properly make payment to its employees, SUBCONTRACTORS and Suppliers; lack of required invoice support; or for any reason permitted by law or equity. When such conditions are remedied, payment will be made for the amounts withheld.

CONTRACTOR, agrees to accept the Final Total Contract Price as full compensation for all Work embraced in the Contract including all loss, damage and risk of every description associated therewith. Furnishing of a fully executed and acceptable Final Release and Waiver of Lien, Exhibit A, shall be a condition to receiving final payment. No payment, except the final payment, shall be evidence of performance of the Contract either wholly or in part, and no payment, including the final payment, shall be construed to be an acceptance of Defective Work or improper material. The final payment shall not relieve CONTRACTOR from responsibility for the discharge of claims or for making available to OWNER for examination and audit all records pertaining to Work performed on a cost-reimbursable basis. Final payment shall not relieve CONTRACTOR from any obligation which by its nature continues beyond completion of the Work, Final Acceptance or final payment, such as, but not limited to, warranty, indemnity and confidentiality obligations.

GC-14.0 BACKCHARGES

In the event of default or Defective Work or materials which, in the sole judgment of OWNER, CONTRACTOR does not upon written notice, proceed to remedy diligently, or if CONTRACTOR, for any reason other than one for which it is entitled to an extension of time, fails to proceed with the Work as scheduled, OWNER may complete the Work and backcharge the related costs against CONTRACTOR. To the direct costs accumulated, OWNER will add thereto an amount of 5 percent to cover costs of general administration and deduct the total from the next payments due CONTRACTOR, or require payment from CONTRACTOR within 30 days.

GC-15.0 SITE CONDITIONS

CONTRACTOR acknowledges that it has satisfied itself as to the nature and location of Work, the general and local conditions which have a bearing thereon and any other matters which can in any way affect the Work or the cost thereof. CONTRACTOR represents that it has made its own interpretations, deductions and conclusions as to the difficulty and cost of successfully performing and completing the Work.

OWNER and ENGINEER disclaim responsibility for data, documents, Drawings or information of any nature whatsoever provided by OWNER or ENGINEER. The accuracy of such information is not warranted and it is the CONTRACTOR'S responsibility to verify its accuracy.

OWNER and ENGINEER assume no responsibility for Site conditions which differ from those ordinarily encountered or generally recognized as inherent in the Work. CONTRACTOR shall bear full responsibility for determining the Site conditions to be encountered and their effect upon the cost of the Work.

GC-16.0 STANDARDS AND CODES

Wherever references are made in the Contract regarding standards and codes, the current edition or revision on the date of this Contract shall apply, unless otherwise expressly set forth. Reference to such standards and codes will be solely for technical information.

GC-17.0 CONTRACT INTERPRETATION

In case of conflicts, errors, omissions and/or discrepancies among the various Contract Documents, the matter shall be submitted in writing within 5 business days by CONTRACTOR to OWNER for clarification. Likewise, all claims and questions concerning interpretation, clarification, compensation, extension of time or the acceptable fulfillment of this Contract on the part of CONTRACTOR, shall be submitted in writing to OWNER for determination.

CONTRACTOR shall be solely responsible for requesting clarifications, instructions and/or interpretations and shall be solely liable for any cost and expenses arising from its failure to do so.

At all times, CONTRACTOR shall proceed with the Work in accordance with the OWNER'S decisions. CONTRACTOR'S failure to take exception to a decision by OWNER within 14 calendar days after receipt thereof, shall be considered concurrence, constitute a waiver by CONTRACTOR of its rights to further protest, and OWNER'S decision shall become final and binding upon CONTRACTOR.

CONTRACTOR may challenge OWNER'S determination and file a detailed written protest within 14 calendar days of OWNER'S decision. OWNER may reconsider its decision upon such protest. If OWNER'S decision remains unchanged, and CONTRACTOR still protests, OWNER and CONTRACTOR shall endeavor to settle the dispute by mutual agreement, or otherwise, as provided in Article GC-19.0 "DISPUTES AND ARBITRATION," of this Section.

GC-18.0 CHANGES AND EXTRA WORK

OWNER may at any time without invalidating the Contract and without notice to the sureties, if any, make changes and may direct CONTRACTOR to perform extra Work.

If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility.

CONTRACTOR shall not commence any changed Work until directed to do so in writing. Upon such direction, CONTRACTOR shall expeditiously perform the extra Work. If such change involves extra cost or extra time to CONTRACTOR, or adversely affects its Work, CONTRACTOR shall promptly advise OWNER in writing. Advisement shall include an estimate of the effect of the change in time and cost, and shall be submitted prior to beginning the Work or no later than 5 working days after the change and/or extra Work is ordered, whichever is later. In the event OWNER directs CONTRACTOR to maintain the existing performance schedule after receipt of proper request for additional time, CONTRACTOR shall promptly advise OWNER of its plan of acceleration.

The estimate shall be based on meeting all the dates set forth in CONTRACTOR'S current approved construction schedule. Sufficient detail on man-hours, rates, quantities, extensions, etc. shall be given in the estimate to permit thorough analysis.

If notice is not given, it shall be deemed that no additional compensation or other adjustment shall be due to CONTRACTOR. If notice is given, or in the opinion of OWNER, such change involves a reduction in the amount of expense or time to CONTRACTOR, OWNER and CONTRACTOR shall endeavor to agree upon an adjustment to the affected terms of the Contract, including the Contract Price. Changes in the Contract Price will be effective only if made by a Contract Change Agreement signed by OWNER and CONTRACTOR.

If so directed by OWNER, in writing, CONTRACTOR shall proceed with the change or extra Work prior to determining the amount of any price or other required adjustments. Thereafter the parties shall use their best efforts to reach mutual agreement. OWNER may pay CONTRACTOR, without prejudice to any claim by either party, the amount of adjustment which in OWNER'S judgment is based on the facts then known. However, this provision shall not be construed to reduce or limit OWNER'S rights or remedies under this or any other provision, including the right to recover overpayments.

GC-19.0 DISPUTES AND ARBITRATION

Except to the extent any party's rights under an applicable insurance policy would be prejudiced, any unresolved dispute relating to this Contract shall be settled by arbitration. Arbitration shall be in accordance with the Construction Industry Arbitration Rules of

the American Arbitration Association in effect at the time of submittal. The law in the jurisdiction in which the Site is located shall govern. The decision shall be final and binding and shall be rendered in writing. The costs of arbitration shall be apportioned between the parties to the arbitration or against either of them as the arbitrator may decide. Company shall have the right but not the obligation to participate in any arbitration proceeding.

GC-20.0 CONSEQUENTIAL DAMAGES

Under no circumstances shall OWNER or ENGINEER be liable to CONTRACTOR for consequential damages including, but not limited to, loss of use or loss of profit, irrespective of the theory upon which claim is brought, and irrespective of whether resulting from negligence or otherwise.

GC-21.0 ATTORNEY'S FEES

In the event of litigation with CONTRACTOR, OWNER shall be entitled to reasonable attorney's fees in addition to any judgment it receives if it is the prevailing party.

GC-22.0 CONTRACTOR SUBMITTALS

CONTRACTOR Submittals shall include Shop Drawings, samples and all other Submittals required by the Contract Documents. All submissions shall be consistent with the project performance schedule. All CONTRACTOR Submittals shall be accompanied by a representation that CONTRACTOR has fully satisfied all of CONTRACTOR'S responsibilities with respect to the preparation and review of the submission including, without limitation, the checking and verification of all field measurements, and the coordination of each Submittal with all other Submittals and with the requirements of the Work and the Contract Documents. The data shown on the CONTRACTOR Submittals shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable OWNER to review the information for conformance with the OWNER'S design concept and for compliance with the information given in the Contract Documents. CONTRACTOR shall make corrections required by OWNER and shall return corrected or new CONTRACTOR Submittals for review and approval. CONTRACTOR shall direct specific attention in writing to any revisions other than the corrections called for by OWNER on previous CONTRACTOR Submittals.

GC-23.0 OWNER APPROVAL OF SUBMITTALS

OWNER will review and take action on CONTRACTOR Submittals with reasonable promptness. OWNER'S review and approval will be only for conformance with the OWNER'S design concept for the compliance with the information given in the Contract Documents. OWNER'S review and approval shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specified means, method, technique, sequence or procedure of construction is required by the Contract Documents). OWNER'S approval shall in no way relieve the CONTRACTOR from responsibility for errors or omissions in the Submittal. Further, OWNER'S review and approval shall not release CONTRACTOR from responsibility for having complied with all requirements of the Contract Documents, unless CONTRACTOR has given OWNER specific written notice (by specific notation on the Submittal) of any variation in the Submittal from the Contract Documents, and OWNER has specifically approved the variation by notation on the approval of the Submittal.

GC-24.0 CONTRACTOR'S PLANT, EQUIPMENT AND FACILITIES

CONTRACTOR shall provide all plant and equipment required to complete the Work in accordance with the schedule. Prior to proceeding with erection of any temporary facilities, CONTRACTOR shall furnish appropriate Drawings and information and receive OWNER'S approval. Unsatisfactory plant and equipment shall be removed from the Site as directed by the OWNER. Otherwise, CONTRACTOR shall not remove construction plant or equipment from the Site before Final Acceptance of the Work without OWNER'S written approval. OWNER shall not unreasonably withhold approval.

GC-25.0 MAINTENANCE AND PROTECTION OF WORK AND PROPERTY

In addition to the requirements of the Consent Decree and the Remedial Action Plan, CONTRACTOR shall perform all Work in a manner causing the least possible obstruction or damage to public and private roads and properties. CONTRACTOR shall preserve and protect all vegetation on or adjacent to the Site which does not unreasonably interfere with the performance of the Work.

CONTRACTOR shall maintain adequate protection of its Work from damage or loss and shall keep all property of ENGINEER and other CONTRACTORS free from unnecessary obstruction, damage or loss attributable to its operations. Throughout the progress of its Work, CONTRACTOR shall provide and maintain all protective measures required by any applicable regulations and prevailing conditions.

In the event of loss or damage, which arises in whole or in part from CONTRACTOR'S acts or omissions, CONTRACTOR shall be responsible for its repair and shall complete the Work. Such repairs and completion of the Work shall be performed as Work under this Contract without additional compensation.

GC-26.0 TITLE TO MATERIALS FOUND

Except as otherwise provided, the title and right to use or dispose of all materials discovered and developed in the Work by CONTRACTOR are expressly reserved for the OWNER. Neither CONTRACTOR nor any of its employees shall have any right, title or interest in or to any part thereof.

GC-27.0 DELIVERY, UNLOADING AND STORAGE OF COMPANY FURNISHED ITEMS

Upon receipt of OWNER-furnished items, OWNER and CONTRACTOR shall make a joint inspection. CONTRACTOR shall provide a written report to OWNER of any damage found. Except for latent damage, failure to report damage shall constitute acceptance of responsibility for same by CONTRACTOR.

All OWNER-furnished items shall be received, unloaded, stored, if required, removed from storage and installed by CONTRACTOR unless otherwise specified. CONTRACTOR shall have complete care, custody, and control until Final Acceptance by OWNER. Care and protection to prevent degradation or damage during handling, storage and installation shall be the responsibility of the CONTRACTOR.

CONTRACTOR shall maintain complete and accurate records of all permanent materials and plant equipment received, stored and issued for use. Records shall be available for OWNER'S review whenever required.

GC-28.0 DELAYS AND FORCE MAJEURE

CONTRACTOR shall advise OWNER in writing within 3 workings days after experiencing a delay, and thereafter continue to advise OWNER concerning such delay. Without limitation, CONTRACTOR shall not be excused from delay due to any act or omission of CONTRACTOR or which is normally incidental to the Work.

Should either party hereto be delayed in the performance of its obligations hereunder, except for the payment of money due, as a result of a force majeure event, such as fire, strike, accident, unanticipated intervention of governmental authorities or application of law, rule or regulation, unusual weather or other matters beyond the reasonable control of either party, such party shall not be liable for damages to the other party for the delays so caused. However, no such occurrence shall be deemed a force majeure event unless written notice of such event is given within 3 working days after the occurrence. Either party experiencing an event of force majeure shall take every reasonable step to mitigate the effects of such event upon the timely performance of its obligations under the Contract.

For excusable delays for which CONTRACTOR has given notice as provided above, CONTRACTOR'S time for completion shall be extended to the extent of such delay. This shall be CONTRACTOR'S sole remedy for such delay.

GC-29.0 LOSS OR DAMAGE BY ACTIONS OF OTHERS OR UPON OTHERS

CONTRACTOR shall have no claim against OWNER or ENGINEER and OWNER or ENGINEER shall not be liable for damage or loss by reasons of delay, default or act of omission of other CONTRACTORS, SUBCONTRACTORS, or their agents or employees, but nothing herein contained shall limit any rights of CONTRACTOR to recover, therefore, against such other CONTRACTORS, SUBCONTRACTORS, or their agents or employees. If CONTRACTOR, by any default, negligence or misconduct on its part, damages any other CONTRACTOR or SUBCONTRACTOR it hereby agrees to be directly responsible to such other CONTRACTOR or SUBCONTRACTOR for any such damage and to indemnify and hold OWNER and ENGINEER harmless from all such damages.

GC-30.0 WAIVER OF BREACH

None of the conditions of the Contract shall be considered waived by OWNER unless such waiver is given in writing. No such waiver shall be a waiver of any past or future default, breach or modification of any of the conditions of the Contract unless expressly stipulated in such waiver.

Failure by OWNER at any time to enforce or require strict compliance with any terms and conditions of the Contract will not constitute a waiver of or impair the terms and conditions in any way, nor shall such failure affect the right of OWNER to avail itself at any time of remedies it may have for any subsequent breach of terms and conditions by CONTRACTOR.

GC-31.0 SUSPENSION OR TERMINATION FOR CONVENIENCE

OWNER reserves the right to suspend or terminate the Contract at any time for its convenience. Such suspension or termination will be made in writing and may include the whole or any specified part of the Contract.

If the Contract, or a specified part thereof, is suspended for convenience of the OWNER, and such suspension unreasonably delays the progress of the Work and causes additional expenses or loss to CONTRACTOR in the performance of the Work, not due to the fault or negligence of CONTRACTOR, the Contract Price will be subject to adjustment in an amount equal to the actual cost incurred by CONTRACTOR as a result of the suspension. Such costs must be substantiated by written records or otherwise proven to the satisfaction of the OWNER. Further, the time of performance of the Contract will be subject to extension by the actual duration of the suspension plus a reasonable extension of the actual duration of the suspension plus a reasonable additional period for remobilization. The Contract will, accordingly, be amended by a Contract Change Agreement provided, however, that any claim by CONTRACTOR for an adjustment hereunder must be asserted within 30 calendar days after receipt of written notice to resume the Work.

If the Contract, or a specified part thereof, is terminated by convenience of the OWNER, CONTRACTOR will be compensated for the reasonable cost of all Work performed or materials furnished including a reasonable profit on the completed portion of the specified part thereof, but shall receive no profit for unperformed Work. In no event shall the total sum paid CONTRACTOR exceed the current Contract Price.

GC-32.0 TERMINATION FOR DEFAULT

Should CONTRACTOR fail to commence the Work or a portion thereof within the specified time, or to prosecute said Work continuously with sufficient workmen and equipment to insure its completion within the time herein specified or as required by an agreed upon performance schedule, or to perform in a safe manner, or to comply with any provision of this Contract, OWNER may elect to give notice in writing of such default, specifying the same. If CONTRACTOR, within a period of 72 hours after receipt of such notice, shall not proceed in accordance therewith to remedy said default, then OWNER shall have full power and authority, without process of law and without violating this Contract, to take the prosecution of the Work, or a portion thereof, away from the CONTRACTOR and complete it by contracting with other parties, using OWNER'S own forces or using such other measures as in OWNER'S opinion are necessary for its completion, including the use of the equipment, plant and other property of CONTRACTOR which is associated with the Work.

Should CONTRACTOR become insolvent or be placed in liquidation or under judicial management, OWNER may require full and complete assurance that satisfactory performance will continue to be achieved. OWNER shall be the sole judge of satisfactory performance and the adequacy of assurances thereof. Said full and complete assurances shall be provided within 72 hours of written request to CONTRACTOR, unless a longer time is specifically allowed. Should, in OWNER'S sole judgment, the assurances be unsatisfactory, OWNER may, without process of law and without violating this Contract, upon written notice take the prosecution of the Work, or a portion thereof, away from the CONTRACTOR and complete it as in the preceding paragraph.

Upon taking over the Work by OWNER, no further payment will be made to CONTRACTOR until the Work, or portion thereof, is completed or other arrangements satisfactory to OWNER are made. Any monies due or that may become due CONTRACTOR under this Contract may be applied by OWNER to payment for labor, material, equipment, subcontracts, administrative expense and any other costs to OWNER in completing the Work or which result from delays in completing the Work. Associated costs and expenses will be charged in accordance with the provisions described in GC-14.0, Backcharges.

Should the expense incurred by OWNER in taking over and completing the Work, or portion thereof, exceed the sum that would have become payable under the Contract, then CONTRACTOR (and CONTRACTOR'S surety, if applicable) shall be liable to the OWNER for the amount of such excess. Should the expense incurred by OWNER be less than the sums that would have become payable, then CONTRACTOR shall be entitled to a portion of the difference computed as follows. CONTRACTOR shall be entitled to pro-rata compensation for Work already performed not exceeding the reasonable cost of Work done and materials supplied by CONTRACTOR to the time of termination plus an equitable profit on Work completed, not exceeding the amount paid plus the difference noted above. No anticipated profits applicable to the uncompleted portions of the Work will be allowed.

If OWNER should incorrectly terminate this Contract for default or for breach, it shall be deemed to be a termination by OWNER for reasons other than cause, and payment shall be made as in the case of termination for convenience. In no event shall OWNER'S liability or CONTRACTOR'S recovery under this Article exceed the total amount determined by application of ARTICLE GC-31.0, "SUSPENSION OR TERMINATION FOR CONVENIENCE."

GC-33.0 EQUAL EMPLOYMENT REQUIREMENTS

CONTRACTOR shall comply with all applicable provisions of Equal Opportunity Clause 41 CFR 60-1.4 (a) and subsequent amendments, and with all applicable Federal, State, and local Equal Employment Opportunity laws, rules, regulations, and orders.

GC-34.0 LABOR AND PERSONNEL

CONTRACTOR shall employ only competent and skilled personnel to perform the Work and shall be responsible for maintaining harmonious labor relations with its employees. CONTRACTOR shall remove and replace unacceptable personnel determined to be incompetent, dishonest, uncooperative or otherwise objectionable when requested to do so by OWNER.

GC-35.0 PERMITS AND LICENSES

CONTRACTOR shall secure and pay for all licenses and permits (other than those specifically listed in the Special Conditions as provided by OWNER) required in connection with performance of the Work and shall hold OWNER and ENGINEER harmless from any failure to do so.

GC-36.0 TAXES

CONTRACTOR shall pay all taxes, levies, duties and assessments of every nature due in connection with any Work under the Contract and shall make any and all payroll deductions required by law. CONTRACTOR hereby indemnifies and holds OWNER and ENGINEER harmless from any liability on account of any and all such taxes, levies, duties, assessments and deductions.

OWNER may provide sales and/or use tax exemption certificates as are applicable and as OWNER deems necessary.

Wisconsin sales tax is applicable.

GC-37.0 PATENTS

CONTRACTOR shall defend, indemnify and hold OWNER and ENGINEER harmless from liability of any nature or kind, including attorney's fees and cost of settlement, for or on account of the use of any patented or unpatented invention, article, appliance or process furnished or used in, or in connection with the performance of the Work.

GC-38.0 INDEMNIFICATION

To the maximum extent permissible by law, and in addition to all the indemnifications required by the Contract Documents, CONTRACTOR and any such SUBCONTRACTOR shall defend, indemnify and hold OWNER and ENGINEER, including their affiliated entities, officers, employees and agents, harmless from any loss, claim, suit, damage or liability from injury or death of any person, including employees of CONTRACTOR or any such SUBCONTRACTOR, or damage or destruction to any property arising from or in connection with any act or omission of CONTRACTOR or any such SUBCONTRACTOR, his officers, agents or employees, regardless of whether there is concurrent or contributory negligence on the part of the OWNER or ENGINEER. This indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or

benefits payable by or for CONTRACTOR or any such SUBCONTRACTOR or other person or organization under workers' or workmen's, compensation acts, disability benefit acts or other employee benefit acts.

GC-39.0 INSURANCE

CONTRACTOR shall procure and maintain, during the period that this Contract remains in force, insurance coverage with limits of not less than those set forth in this clause. All policies shall name the OWNER and ENGINEER as additional insured and an endorsement shall be provided to the OWNER and ENGINEER prior to start of the Work. CONTRACTOR will require all insurance companies, issuing policies of insurance for CONTRACTOR, to certify to OWNER, prior to commencement of any Work, that such policies have been issued and are currently in effect. Certified copies of insurance policies procured by CONTRACTOR shall be furnished to OWNER within one week of receipt of Notice to Proceed. In the event any Work to be performed under this Contract is further sublet, the CONTRACTOR will require the same insurance coverage, limits and certification from its lower tier SUBCONTRACTORS.

Policies issued for CONTRACTOR shall be endorsed to include, for the benefit of the OWNER and ENGINEER, the following:

a. A 30-day advance written notice in the event of cancellation, non-renewal or material change of any policy.

b. Except as to workers' compensation insurance, the OWNER and ENGINEER shall be an additional insured party.

c. A waiver of subrogation in favor of OWNER and ENGINEER as to workers' compensation insurance.

d. CONTRACTOR'S insurance shall be primary and any insurance maintained by OWNER and ENGINEER shall be considered excess and noncontributory.

e. Cross liability or severability of interest clause (liability policies only).

The minimum coverages and policy limits shall be:

1. Workers compensation on their employees.

2. General liability, auto, and property damage of at least $1,000,000 per occurrence and $2,000,000 aggregate.

3. An umbrella liability policy of at least $2,000,000.

4. Automobile liability insurance covering all owned, non-owned and hired vehicles engaged in or about the work site, with a combined single limit of $1,000,000.

OWNER, by requiring the foregoing minimum insurance coverages, will not be deemed to limit any of the other obligations or liabilities of CONTRACTOR. Deductibles, if any, will be the responsibility of CONTRACTOR to pay.

If and to the extent required by the Special Conditions, the OWNER will provide "all risk" builder's insurance.

GC-40.0 INSPECTION AND REJECTION OF MATERIALS AND WORKMANSHIP

All Work, including materials, workmanship, and places where performance shall take place, shall be subject to inspection and tests by OWNER at any reasonable time. Failure to inspect, test, discover defects or to object thereto, shall not prejudice or operate as a release or waiver of the rights of OWNER, including the right to inspect or reject at a later time, nor shall it release CONTRACTOR from complying fully with the Contract requirements.

GC-41.0 USE OF FACILITIES PRIOR TO COMPLETION OF THE WORK

OWNER may take possession and use the Work or any part thereof whenever it is in OWNER'S best interests. However, if such use increases the cost or delays completion of the Work, CONTRACTOR shall be entitled to extra compensation or an extension of time,

or both. Use of the Work, or part thereof, shall in no case be construed as constituting acceptance. Prior to Final Acceptance all necessary repair or adjustment, not due to OWNER'S usage, shall be made by and at the expense of CONTRACTOR.

GC-42.0 TESTING AND STARTUP

Unless otherwise provided by this Contract, CONTRACTOR shall perform all required testing and demonstrate that all systems and equipment function in accordance with their intent and the requirements of the Contract. Testing and startup shall be performed in the presence of OWNER'S designated representatives if requested. All results shall be recorded by CONTRACTOR and submitted for the record.

GC-43.0 WARRANTIES

CONTRACTOR warrants that its Work complies with the requirements of the Contract, is free of defects and is of the highest quality workmanship for 12 months after Final Acceptance, or any longer period when covered elsewhere in the Contract Documents. Should any defect appear, CONTRACTOR shall promptly and diligently complete repair of the defect as required by OWNER. Such repair shall be performed at no additional compensation to the CONTRACTOR.

GC-44.0 CLEANUP

CONTRACTOR shall keep its Work areas in a neat, clean and safe condition at all times. Upon completion of the Work, or any separable portion thereof, CONTRACTOR shall remove and satisfactorily dispose of all plant, equipment, buildings, unused materials and rubbish and shall leave the associated area in a neat, clean and safe condition. Should CONTRACTOR fail to comply, OWNER reserves the right, upon 24 hours notice, to cleanup the area at CONTRACTOR'S expense, in accordance with the Provisions of GC-14.0 "BACKCHARGES."

GC-45.0 FINAL ACCEPTANCE

When CONTRACTOR deems the Work finally complete, CONTRACTOR shall give OWNER notice thereof in writing. Within 14 calendar days after receipt of such notice, OWNER will determine if the Work has been completed according to the terms of the Contract and, if so, will notify CONTRACTOR in writing of acceptance thereof. If the Work is incomplete, OWNER will notify CONTRACTOR of the defects and/or omissions, and CONTRACTOR shall repeat the procedure stated herein until the Work has been completed and accepted.

Final Acceptance of the Work will be confirmed by Letter of Acceptance issued by OWNER promptly after being satisfied that all requirements of the Contract have been met, including delivery of marked-up prints to be utilized in development of As-built Drawings, Submittals of special warranties, spare parts lists, operating procedures and other specified documentation and presentation of a complete and executed Final Release and Waiver of Lien, Exhibit A. OWNER will provide also and/or use tax exemption certificates as are applicable and as OWNER deems necessary.

SECTION 5

ADMINISTRATIVE SPECIFICATIONS

Section 01000 - General Specifications

Section 01002 - Specific Conditions

Section 01400 - Quality Control

Section 01505 - Mobilization, Demobilization and Decontamination

Section 01530 - Health and Safety Considerations

Section 01568 - Erosion and Sediment Control

Section 01700 - Contract Closeout

SECTION 6

TECHNICAL SPECIFICATIONS

Section 02110 - Site Clearing, Grubbing and Stripping/Stockpiling Topsoil

Section 02211 - General Site Grading

Section 02220 - Replacement of Landfill Cap

Section 02221 - Earthwork

Section 02920 - Site Cleanup and Restoration

Section 15675 - Gas Extraction Wells

Section 15677 - Leachate Extraction Units and System Inspections or Modifications

Section 15680 - Gas Extraction System

Section 16010 - General Electrical Requirements

SECTION 01000

GENERAL SPECIFICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Definitions.

B. Abbreviations.

C. Handling, Distribution, and Storage of Materials.

D. Samples and Inspection of Materials.

E. Occupying Private Land.

F. Interference with and Protection of Streets.

G. Safety.

H. Complaints.

I. Lines, Grades, and Measurements.

J. Work to Conform.

K. Precautions during Adverse Weather.

L. Electrical Energy.

M. Measurement and Payment.

N. Submittals.

O. Health and Safety Considerations.

P. Interpretation of Plans and Specifications.

Q. Guarantee Warranty.

1.2 DEFINITIONS

Wherever the words defined in this Section or pronouns used in their stead occur in the Contract Documents, they shall have the meanings herein given.

A. OWNER is the Landfill Remediation Trust.

B. CLIENT is the Landfill Remediation Trust.

C. ENGINEER is Dames & Moore, 2701 International Lane, Suite 210, Madison, Wisconsin 53704.

D. As Directed, As Required, etc.

Wherever in the Contract Documents, or on the Plans, the words "as directed", "as ordered", "as requested", "as required", "as permitted", or words of like import are used, it shall be understood that the direction, order, request, requirement, or permission of the ENGINEER is intended. Similarly, the words "approved", "acceptable", "suitable", "satisfactory", and words of like import shall mean approved by, acceptable to, suitable to, or satisfactory to the ENGINEER.

E. Where "as shown", "as indicated", "as detailed" or words of similar import are used in the Specifications, it shall be understood that reference to the Contract Plans is made unless stated otherwise. The Plans are the property of the OWNER and shall not be used for any purpose other than that contemplated by this Specification.

F. Elevation.

The figures given on the Plans or in the other Contract Documents after the word "elevation" or abbreviation of it shall mean the distance in feet above the datum, Mean Sea Level (MSL), adopted by the ENGINEER.

G. Earth.

The word "earth", wherever used as the name of an excavated material or material to be excavated, shall mean all kinds of material other than rock.

1.3 ABBREVIATIONS

Where any of the following abbreviations are used in the Contract Documents, they shall have the meaning set forth opposite each.

ANSI	American National Standard Institute
ASTM	American Society for Testing and Materials
EPA	Environmental Protection Agency
Fed.Spec.	Federal Specifications issued by the Federal Supply Service of the General Services Administration, Washington, D.C.
ILHR	Industry, Labor and Human Relations (Wis. Adm. Code)
PECFA	Petroleum Environmental Cleanup Fund
NEC	National Electrical Code; latest edition
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
WDNR	Wisconsin Department of Natural Resources
Wis. Adm. Code	Wisconsin Administrative Code
WDOT	Wisconsin Department of Transportation

1.4 HANDLING, DISTRIBUTION, AND STORAGE OF MATERIALS

A. CONTRACTOR shall handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished by him, until the final completion and acceptance of the Work.

B. Storage and demurrage charges by transportation companies and Vendors shall be borne by the CONTRACTOR.

C. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Materials and equipment shall be kept

neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants, and occupants. CONTRACTOR shall secure at his sole expense permission from proper parties for the use of land necessary to stockpile excavated materials or store equipment, should existing right-of-ways, etc., not be available for this purpose.

1.5 SAMPLES AND INSPECTION OF MATERIALS

A. Unless otherwise expressly provided on the Plans or in any of the other Contract Documents, only new materials and equipment shall be incorporated in the Work. All materials and equipment furnished by the CONTRACTOR to be incorporated in the Work shall be subject to the inspection of the ENGINEER. No material shall be processed or fabricated for the Work or delivered to the Work Site without prior concurrence of the ENGINEER.

B. Facilities and labor for the storage, handling, and inspection of all materials and equipment shall be furnished by the CONTRACTOR. Defective materials and equipment shall be removed immediately from the Site of the Work.

C. If the ENGINEER so requires, either prior to or after commencement of the Work, the CONTRACTOR shall submit samples of materials for such special tests as the ENGINEER deems necessary to demonstrate that they conform to the Specifications. Such samples shall be furnished, taken, stored, packed, and shipped by the CONTRACTOR as directed.

D. All samples shall be packed so as to reach their destination in good condition, and shall be labeled to indicate the materials represented, the name of the building or Work and location for which the material is intended, and the name of the CONTRACTOR submitting the sample. To ensure consideration of samples, the CONTRACTOR shall notify the ENGINEER by letter that the samples have been shipped and shall properly describe the samples in the letter. The letter of notification shall be sent separate from and should not be enclosed with the samples.

E. CONTRACTOR shall submit data and samples, or place his orders, sufficiently early to permit consideration, inspection and testing before the materials and equipment are needed for incorporation in the Work. The consequences of his failure to do so shall be the CONTRACTOR's sole responsibility.

1.6 OCCUPYING PRIVATE LAND

A. CONTRACTOR shall not (except after written consent from the proper parties) enter or occupy with men, tools, materials, or equipment, any land outside road

rights-of-way, utility easements, or the designated property of the OWNER. CONTRACTOR shall secure at his sole expense any temporary access or construction easements necessary to conduct the Work in a timely manner in accordance with the project schedule. The CONTRACTOR shall be solely responsible for securing the proper permit for Work within road right-of-ways. A copy of the signed written consent shall be submitted to the ENGINEER.

1.7 INTERFERENCE WITH AND PROTECTION OF STREETS

A. CONTRACTOR shall not close or obstruct any portion of a street, road, or private way without obtaining permits from the proper authorities. If any street, road or private way shall be rendered unsafe by the CONTRACTOR's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.

B. Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the CONTRACTOR, who shall assume and have full responsibility for the adequacy and safety of provisions made therefor.

C. The CONTRACTOR shall, at least 48 hours in advance, notify the Town of Hudson Chairperson in writing, with a copy to the ENGINEER, if the closure of a street or road is necessary. Said closures shall be in compliance with an approved Maintenance of Traffic Plan and the proposed construction schedule.

D. All Work shall be so conducted as to cause a minimum of inconvenience to pedestrian and vehicular traffic and to private and public properties adjacent to the Work. It shall be the duty of the CONTRACTOR to maintain crossings, walks, sidewalks, and other roadways open to the traffic and in a satisfactory condition, to keep all fire hydrants, water valves, fire alarm boxes, and letter boxes accessible for use. Wherever it is necessary to maintain pedestrian traffic over open trenches, a timber bridge conforming to requirements of the Department of Labor, OSHA Standards shall be provided.

1.8 SAFETY

A. CONTRACTOR shall take all necessary precautions and provide all necessary safeguards to prevent personal injury and property damage. CONTRACTOR shall provide protection for all persons including but not limited to his employees and employees of other CONTRACTORS or SUBCONTRACTORS; members of the public; and employees, agents, and representatives of the CLIENT, the ENGINEER, and regulatory agencies that may be on or about the Work. CONTRACTOR shall provide protection for all public and private property

including but not limited to structures, pipes, and utilities, above and below ground.

B. CONTRACTOR shall provide and maintain all necessary safety equipment such as fences, barriers, signs, lights, walkways, guards and fire prevention and fire-fighting equipment and shall take such other action as is required to fulfill his obligations under this Subsection.

C. CONTRACTOR shall comply with all applicable Federal, State and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property.

D. CONTRACTOR shall designate a responsible member of his organization at the Site whose duty shall be the prevention of accidents. This responsible person shall have the authority to take immediate action to correct unsafe or hazardous conditions and to enforce safety precautions and programs.

E. If serious injury or damage occurs, the accident shall be reported immediately by telephone or messenger to the ENGINEER and to appropriate local authorities. In addition, the CONTRACTOR must promptly report in writing to the ENGINEER all accidents occurring in connection with the Work, giving full details, names, and statements of witnesses.

F. If a claim is made by anyone against the CONTRACTOR or any SUBCONTRACTOR resulting from an accident, CONTRACTOR shall promptly report the facts in writing to the ENGINEER, giving full details of the claim, including investigation and restitution.

G. CONTRACTOR shall execute all Work in a fire-safe manner. He shall supply and maintain on the Site adequate fire-fighting equipment capable of extinguishing incipient fires. CONTRACTOR shall comply with applicable fire-prevention laws. Where these laws do not apply, applicable parts of the NFPA No. 241 shall be followed.

1.9 COMPLAINTS

A. All complaints received by the CONTRACTOR shall be reported to the ENGINEER no later than the working day following receipt thereof. Such reports shall include the name, address, date and time received, date and time of action complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Each complaint shall be assigned a separate number, and all complaints shall be numbered consecutively in order of receipt. In the event more than one complaint is received from the

same complainant, each latter complaint shall show all previous complaint numbers registered by the same complainant.

B. When settlement of a claim is made, the ENGINEER shall be furnished with a copy of the release of claim by the claimant. No settlement shall be made unless such settlement also releases ENGINEER and CLIENT.

1.10 LINES, GRADES, AND MEASUREMENTS

A. CONTRACTOR shall verify existing Site grades to be substantially consistent with grades shown on the Plans before commencing Work, and shall report any significant conflict in grades to the ENGINEER before proceeding.

B. CONTRACTOR shall establish all lines, elevations, reference marks, batter boards, etc., needed by the CONTRACTOR during the progress of the Work, and from time to time shall verify such marks by instrument or other appropriate means. ENGINEER will provide locations of extraction wells.

C. CONTRACTOR shall carefully preserve existing bench marks, reference points, targets and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.

D. ENGINEER shall be permitted at all times to check the lines, elevations, reference marks, batter boards, etc., set by the CONTRACTOR, who shall correct any errors in lines, elevations, reference marks, batter boards, etc., disclosed by such check. Such a check shall not construed to be an approval of the CONTRACTOR's Work and shall not relieve or diminish in any way the responsibility of the CONTRACTOR for the accurate and satisfactory construction and completion of the entire Work.

E. CONTRACTOR shall make all measurements and check all dimensions necessary for the proper construction of the Work called for by the Plans and Specifications. During the prosecution of the Work, he shall make all necessary measurements to prevent misfitting in said Work, and he shall be responsible therefore, for the accurate construction of the entire Work.

1.11 WORK TO CONFORM

A. CONTRACTOR shall provide adequate and satisfactory supervision, sufficient equipment and workmen at the job to carry on the Work at a rate of speed satisfactory to the CLIENT.

B. CONTRACTOR shall proceed with the Work in a manner that Work being performed by others shall not be interfered with, interrupted or delayed.

C. During its progress and on its completion, the Work shall conform truly to the lines, levels, and grades indicated on the Drawings or given by the ENGINEER and shall be built in a thoroughly substantial and workmanlike manner, in strict accordance with the Plans, Specifications, and other Contract Documents and the directions given from time to time by the ENGINEER.

D. All Work done without instructions having been given therefore by the ENGINEER, without proper lines or levels, or performed during the absence of the ENGINEER, will not be estimated or paid for except when such Work is authorized by the ENGINEER in writing. Work so done may be ordered uncovered or taken down, removed, and replaced at the CONTRACTOR's expense.

1.12 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather and against the possibility thereof, CONTRACTOR shall take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.

1.13 ELECTRICAL ENERGY

A. CONTRACTOR shall make all necessary applications and arrangements and pay all fees and charges for electric energy for the power and light necessary for the proper completion of the Work and during its entire progress. CONTRACTOR shall provide and pay for all temporary wiring, switches, connections, and meters.

B. CONTRACTOR shall provide sufficient electric lighting so that all Work may be done in a workmanlike manner when there is not sufficient daylight.

1.14 MEASUREMENT AND PAYMENT

A. Measurement for payment shall be based upon completed Work performed in strict accordance with the Plans and the payment schedule of the Bid.

B. The quantities and measurements indicated in the Bid are for bidding and Contract purposes only. The quantities and measurements supplied or placed in the Work and verified by the ENGINEER shall determine payment.

C. If the actual Work requires more or fewer quantities than those quantities indicated, CONTRACTOR shall provide the required quantities at the unit prices contracted.

D. When unit quantities stipulated in the Bid are increased in excess of 125 percent or decreased below 75 percent of the original Contract quantity, the ENGINEER will review the unit price to determine if a new unit price shall be negotiated. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original Contract item quantity, or in case of a decrease below 75 percent, to the actual amount of Work performed. The basis for the adjustment shall be negotiated. If a basis cannot be agreed upon, then an adjustment will be made either for or against the CONTRACTOR in such amount as the ENGINEER may determine to be fair and equitable.

E. CONTRACTOR shall submit an application for monthly payment to the ENGINEER for review and approval upon partial completion of the project before the CONTRACTOR will be compensated for the Work performed during that period. The application shall invoice Work completed as detailed in the CONTRACTOR's proposal. Final payment in full will be made when Work is completed to the satisfaction of the CLIENT and ENGINEER, when it has been shown that the CONTRACTOR has discharged all obligations of this Contract, and when all punch list items have been corrected.

1.15 SUBMITTALS

A. CONTRACTOR shall schedule submittals to expedite the project, and deliver to the ENGINEER at the appropriate business address. Coordinate submission of related items.

B. CONTRACTOR shall identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.

C. CONTRACTOR shall revise and resubmit submittals as required.

D. CONTRACTOR shall submit initial progress schedule to ENGINEER within 7 days after date of award of Contract.

E. Within 7 days after date of award of Contract, CONTRACTOR shall submit any changes to the complete list of all products proposed for use, with name of manufacturer, trade name, and model number of each product.

F. CONTRACTOR shall provide Shop Drawings, as defined in the Contract clauses, and as specified in individual Work Sections including, but not necessarily limited to electrical details, fabrication and erection/installation drawings, scheduling information, setting diagrams, actual shopwork manufacturing instruction, and coordination drawings, as applicable to the Work.

G. CONTRACTOR shall provide product data including standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, manufacturer's printed statements of compliance and applicability, catalog cuts, product photographs, production or quality control inspection and test reports and certifications, and product warranties.

H. The review and approval of Shop Drawings, samples or catalog data by the ENGINEER will not relieve the CONTRACTOR/Vendor from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the CONTRACTOR/Vendor and the ENGINEER will have no responsibility therefor.

I. No portion of the Work requiring Shop Drawings, working drawings, samples, or catalog data shall be started nor shall any materials be fabricated, installed or used on this Site prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved Shop Drawings and data shall be at the CONTRACTOR'S risk. Neither the CLIENT nor the ENGINEER will be liable for any expense or delay due to corrections of remedies required to accomplish conformity.

1.16 HEALTH AND SAFETY CONSIDERATIONS

A. CONTRACTOR acknowledges that the project Site involves materials which have been alleged to be hazardous. CONTRACTOR shall conduct all operations under the Contract in a manner to avoid risk of bodily harm to persons or damage to property and in full compliance with OSHA, MSHA, OWNER and ENGINEER requirements, and any and all other applicable legal requirements. Further, CONTRACTOR shall continuously inspect its Work, materials and equipment to identify any unsafe conditions and shall promptly take action to correct any condition which presents such a risk.

B. CONTRACTOR represents and warrants that it is fully qualified and knowledgeable with respect to all health and safety requirements relating to the Work and that as an independent contractor, CONTRACTOR shall be solely responsible for compliance with those requirements.

C. CONTRACTOR shall prepare a written Health and Safety Plan and submit it to Dames & Moore a minimum of two (2) working days prior to the start of any field activity.

D. CONTRACTOR shall comply with all applicable OSHA regulations. The CONTRACTOR's Health and Safety Plan does not supersede or in any way relieve the CONTRACTOR of obligations under any applicable OSHA regulations including 29 CFR 1910: Occupational Safety and Health Standards and 29 CFR 1926: Health and Safety Regulations for Construction.

E. CONTRACTOR shall do all work necessary to protect persons from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalks or walkways, and trenches or excavations in roadways. Barricades, lanterns, and proper signs shall be furnished as necessary to insure safety.

F. The performance of all Work and all completed construction, particularly with respect to ladders, platforms structure openings, scaffolding, shoring, lagging, and machinery guards, shall be in accordance with the requirements of applicable governing safety authorities.

G. During progress of the Work, CONTRACTOR shall at all times maintain satisfactory temporary chain link fencing, solid fencing, railing, barricades, or steel plates, as applicable, at all openings, obstructions, or other hazards in roadways, sidewalks, floors, roofs, walkways, and the like. All barriers shall have adequate warning lights required for public safety.

1.19 INTERPRETATION OF PLANS AND SPECIFICATIONS

A. Should errors appear in the Drawings or in the work done by others affecting this work, the CONTRACTOR shall immediately notify the ENGINEER, who will issue instructions as to procedure. If the CONTRACTOR proceeds with the work so affected with the instruction from the ENGINEER, he shall remove the incorrect work or make necessary corrections to comply with the ENGINEER's instructions at no cost. This included typographical errors in the Specifications and notational errors on the Drawings where doubtful of interpretation.

1.20 GUARANTEE WARRANTY

A. The CONTRACTOR shall and hereby does warrant and guarantee that all work executed under this Contract will be free from defects of materials and workmanship for a period of one (1) year from the date of final acceptance of the project; except that certain specific items of work may require a guarantee or

warranty for a greater period of time where hereinafter specified; the CONTRACTOR further agrees to repair or replace, at his own expense, all such defective work and repair or replace, at his own expense, all such defective work and all other damaged thereby, which becomes defective during the term of the above-mentioned guarantees and warranties.

B. The CONTRACTOR further agrees that with 10 calendar days after being notified in writing by the CLIENT of any work not in accordance with the requirements of the Contract, or any defects in the work, he will commence and prosecute with due diligence all work necessary to fulfill the terms of this guarantee, and to complete the work within a reasonable period of time; and in the event he fails to so comply, he does hereby authorize the CLIENT to proceed to have such work done at the CONTRACTOR's expense, and he will pay the cost thereof upon demand, the CLIENT shall be entitled to all costs, including reasonable attorney's fees incurred upon the CONTRACTOR's refusal to pay the above costs.

C. Notwithstanding the foregoing Subsection (B), in the event of an emergency constituting an immediate hazard to the health or safety of the OWNER's employees or property, the OWNER may undertake, at the CONTRACTOR's expense, without prior notice, all work necessary to correct such hazardous conditions when it was caused by work of the CONTRACTOR not being in accordance with the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01002

SPECIFIC CONDITIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Nature of Conditions.

B. Site Description.

C. Description of Work.

D. Utilities.

E. Site Cleanup.

F. Finishing of Site and Storage Areas.

G. Permits.

H. Taxes.

I. Scheduling.

J. Emergency Phone Numbers.

1.2 NATURE OF CONDITIONS

A. The following conditions are a supplement to the General Conditions of the project and detail specific additional requirements and responsibilities of the CONTRACTOR during execution of the Work.

1.3 SITE DESCRIPTION

A. The Work on this project is located at the closed Junker Sanitary Landfill, located in the SE¼ of the SE¼ of Section 13, T29N, R19W, Town of Hudson, St. Croix County, Wisconsin.

B. The Site was formerly operated as a solid waste landfill from 1972 to 1987. The site was closed in 1987, after which time it was covered, regraded, capped and had an active gas extraction system installed.

C. Site investigation results indicate that two areas along the north and northwest boundary of the landfill contain uncapped waste. In addition, several areas along the landfill surface have subsided. Because of the potential for production of leachate and contamination of groundwater, the WDNR recommends relocating the waste within the capped area and regrading the subsidence areas to minimize potential infiltration sources.

D. Additional site investigations have shown that the ditch along Alexander Road is deficient in compacted clay. In addition, the ditch is not properly graded, allowing water to pond in several areas. The WDNR recommends placing clay in the deficient areas and regrading the ditch to permit drainage to either of two detention ponds located at the site.

E. Landfill gases are migrating beyond the limits of the waste along the southern boundary of the landfill. In addition, hotspots of VOC gases have been identified within the landfill as well as an area of leachate in the southeast corner of the landfill. The WDNR recommends placing additional gas extraction wells to maximize removal of VOCs and prevent the migration of landfill gases which are a potential threat to dwellings south of the landfill. In addition, the gas extraction wells will have pumps installed to assist with removal of leachate.

1.4 DESCRIPTION OF WORK

A. Briefly and without force and effect on the Contract Documents, the Work associated with this project can be summarized as follows:

1. Install 3 additional gas extraction wells at locations shown on the Plans.

   a) Each well shall consist of 6-inch diameter Schedule 80 PVC pipe. Slotted well pipe shall be factory-slotted screen with slot size 0.040 inch.

   b) The two wells installed in the southeast corner of the landfill shall have the wellhead fitted with a manufactured assembly containing a flow control valve, and a sample port for measuring vacuum, flow and gas composition, a pitless adapter to allow leachate pumping, and leachate pumps, as shown on the design plans.

c) The lateral connecting the extraction wellhead to the lateral/header pipe shall consist of a short section of flexible pipe and 3-inch diameter HDPE pipe.

d) The lateral connecting the pumping wells to the lateral/header pipe shall consist of a short section of one-inch double-walled pipe (when above ground) and 3-inch diameter HDPE pipe below ground.

e) Waste cuttings produced from well installation activities shall be incorporated in the designated spoils area on-site (the location to be determined by ENGINEER).

2. Install 3-inch diameter HDPE header pipe; connect to the existing lateral/header pipe and the lateral at each extraction well.

a) The gas conveyance piping shall be installed in a trench excavated into the existing cover and the buried waste. This conveyance piping shall be connected to the existing gas conveyance piping by installing a tee and butt fuse welding the header pipe to this tee.

b) Handle excavated waste by incorporating it in the designated spoils area on-site.

c) The trench shall be backfilled with appropriate material.

d) The clay cap shall be restored.

3. Inspect existing laterals identified on the plan sheets; survey elevations at designated locations and determine existing slope of laterals.

a) The existing lateral piping shall be excavated and surveyed at the points shown on the plan sheets.

b) The record elevations shall be compared to existing elevations. Resetting of the laterals shall establish pipe at record elevations.

c) Rebed the pipe to provide sound base for laterals, as necessary.

d) Add vacuum monitoring and access ports at the locations shown on the plan sheets.

4. Excavate the waste, approximately 1500 cy, from the north-northwest boundary of the landfill and use it to regrade the subsidence areas.

a. Strip off cover soils in locations designated by ENGINEER as subsidence areas.

b. Place excavated waste to re-establish final waste grades in the subsidence areas.

c. Replace clay cap and compact.

d. Replace remaining cover soils and compact.

e. Restore vegetation.

5. Backfill excavated waste area, approximately 1500 cy, with acceptable borrow soils. Restore gravel road.

6. Replace clay barrier layer along the south perimeter ditch and regrade the ditch to allow drainage to the on-site detention ponds.

7. Abandon existing passive gas vent system.

a) Remove passive vents to below the clay layer.

b) Place passive gas vents and associated piping in designated spoils area on landfill.

8. Site Restoration: Proper off-site disposal of concrete, drummed liquids, empty drums, debris, landscaping, etc. as necessary.

B. CONTRACTOR shall not start Work prior to meeting with the ENGINEER.

C. CONTRACTOR shall perform the Work complete, in place, and shall include repairs, replacement, and restoration required as a result of damages caused during this construction.

D. Furnish and install all materials, equipment, and labor which is necessary for the proper completion of the Work, whether specifically indicated in the Contract Documents or not, and at no additional cost to the OWNER or ENGINEER.

1.5 UTILITIES

A. Information shown on the Plans as to the location of existing utilities has been prepared from the most reliable data available to the ENGINEER. This information is not guaranteed, however, and it shall be the CONTRACTOR's

responsibility to determine the location, character, and depth of any existing utilities.

B. CONTRACTOR shall be responsible for locating all utilities and obstructions prior to beginning Work. This shall include notification to the "Digger's Hotline" and meeting at the Site with utility representatives to verify locations. Any discrepancies or differences found shall be brought to the attention of the ENGINEER and OWNER in order that necessary changes may be made to permit installation of any new pipe.

C. CONTRACTOR shall be responsible for and correct all damage (at his sole expense) to any pavement, landscaping, fences, buildings, telephone or other cables, overhead and under ground electric power lines water mains, sanitary sewers, or their structures which he may damage as a result of his construction, whether or not the item is shown on the Plans.

1.6 SITE CLEANUP

A. During the Work, the construction areas shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. Upon completion of the Work, the CONTRACTOR shall hand-rake and drag all former grassed and planted areas, leaving all disturbed areas free from rocks, gravel, clay, or any other foreign material. The finished surface shall conform to the original surface, and shall be free-draining and free from holes, ruts, rough spots, or other surface features detrimental to a seeded area.

1.7 FINISHING OF SITE AND STORAGE AREAS

A. Upon completion of the project, all areas used by the CONTRACTOR shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the adjoining property.

B. The Site shall be returned to pre-construction conditions; similar grades shall be achieved and similar surficial materials shall be placed.

1.8 PERMITS

A. CONTRACTOR shall secure at his sole expense any permits and licenses necessary for the prosecution of the Work. These permits and licenses shall include, but not be limited to, building permits, refuse and debris disposal permits,

tree removal permits, etc. CONTRACTOR shall furthermore be responsible for all costs and expenses associated with compliance with the terms and conditions of said permits and/or licenses.

1.9 TAXES

A. CONTRACTOR shall pay all applicable local, State and Federal taxes, consumers use and other similar taxes required by law to complete the Work.

1.10 SCHEDULING

This Article specifies requirements and procedures in construction schedules and reports for planning, coordinating, executing, and monitoring the progress of the Work. CONTRACTOR shall schedule the Work such that delays in receiving equipment do not cause unnecessary delays in the overall progress of the Work. All Work shall be substantially completed by July 15, 1997. All Work shall be completed and ready for final payment by July 30, 1997. If these dates are unattainable, the CONTRACTOR shall notify the ENGINEER of the reason, and propose a revised schedule.

A. Submittals

1. The following submittals shall be provided with the Bid:

a) Construction schedule.

B. Construction Schedule Updates

1. If actual progress is observed to deviate from the construction schedule by more than one (1) week, the CONTRACTOR shall update and submit a revised construction schedule to ENGINEER. In the case of Work that is behind schedule, the CONTRACTOR shall submit to ENGINEER, a written plan and revised schedule for completing the Work within the Contract Time.

2. If the CONTRACTOR desires to make any changes in the construction schedule, he shall submit requested revisions to ENGINEER including a description of the logic for rescheduling the Work and method of maintaining adherence to intermediate milestones and contractual completion dates. Contract Time extensions and schedule revisions shall be incorporated into an updated construction schedule in a timely manner, reflecting affects on the Contract Time for completion.

1.11 EMERGENCY PHONE NUMBERS

A. Prior to starting construction, the CONTRACTOR shall supply the ENGINEER and OWNER with phone numbers of personnel who will be "on call" 24 hours per day.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Work.

B. Field Tests.

C. Submittals During Construction.

D. Submittal Requirements.

E. ENGINEER's Action.

F. As-Built (Record) Plans.

G. Operations and Maintenance Manual.

1.2 DESCRIPTION OF WORK

A. Submittals containing materials and equipment associated with the Project shall be handled by the CONTRACTOR as specified herein in order to assure that the intent of the Specifications is met and that the equipment will function effectively and properly.

1.3 FIELD TESTS

A. The CONTRACTOR will be responsible for in-place soil compaction testing, if required by the ENGINEER. In the event of failure, retesting and replacement of material shall be at the CONTRACTOR's expense.

B. Submit testing reports, including laboratory analysis of results (and recommendations where applicable) in duplicate to ENGINEER. Submit copies directly to governing authorities where required or requested.

C. CONTRACTOR shall be responsible for maintaining separation of cover soil materials when pulling back the cap on the landfill subsidence areas. Separate areas shall be designated for topsoil, rooting soil and clay cap materials. The clay cap material shall not be contaminated with either topsoil or rooting soil materials.

Need for additional clay borrow material shall be determined during the site activity. The CONTRACTOR shall have previously identified an approved clay borrow site in conformance with s. NR 512, Wisconsin Administrative Code.

1.4 SUBMITTALS DURING CONSTRUCTION

A. Submittal Procedures

1. Coordination: Coordinate the preparation and processing of Submittals with the performance of the Work. Coordinate each separate Submittal with other Submittals and related activities such as testing, purchasing, fabrication, delivery, and similar activities that require sequential activity.

   Coordinate the Submittal of different units of interrelated Work so that one Submittal will not be delayed by the ENGINEER's need to review a related Submittal. The ENGINEER reserves the right to withhold action on any Submittal requiring coordination with other Submittals until related Submittals are forthcoming.

2. Coordination of Submittal Times: Prepare and transmit each Submittal to the ENGINEER sufficiently in advance of the scheduled performance of related Work and other applicable activities. Transmit different kinds of Submittals for the same unit of Work so that processing will not be delayed by the ENGINEER's need to review Submittals concurrently for coordination.

3. Review Time: Allow sufficient time so that the installation will not be delayed as a result of the time required to properly process Submittals, including time for resubmittal, if necessary. Advise the ENGINEER on each Submittal, as to whether processing time is critical to the progress of the Work and if the Work would be expedited if processing time could be shortened.

4. Submittal Preparation: Mark each Submittal with a permanent label for identification. Provide the following information on the label for proper processing and recording of action taken:

   Project name.
   Date.
   Name of Manufacturer.
   Number and title of appropriate Specification Section.
   Plan number and detail references, as appropriate.
   Similar definitive information as necessary.

Provide a space on the label for the CONTRACTOR's review and approval markings, and a space for the ENGINEER's "Action" marking.

By approving and submitting shop drawings and samples, the CONTRACTOR thereby represents that he has determined and verified all field dimensions and measurements, field construction criteria, materials, catalog numbers and similar data, and that he/she has reviewed, approved, and coordinated such submittals with the requirements of the Work and the Contract Documents.

5. Submittal Transmittal: Package each Submittal appropriately for transmittal and handling. Transmit each Submittal from the CONTRACTOR to the ENGINEER, and to other destinations as indicated, by use of a transmittal form. Submittals received from other sources, other than the CONTRACTOR, will be returned to the sender "without action".

1.5 SPECIFIC SUBMITTAL REQUIREMENTS

A. General: Product data Submittal is required for information and record, and to determine that the products, materials, and systems comply with the provisions of the Contract Documents. Therefore, the initial Submittal is also the final Submittal, except where the ENGINEER observes that there is non-compliance with the provisions of the Contract Documents and returns the Submittal promptly to the CONTRACTOR marked with the appropriate "Action".

B. Initial Submittal: Except as otherwise indicated in individual Sections of these Specifications, submit 2 copies of each required product data Submittal. The ENGINEER will retain one copy, and will return the other marked with "Action" and corrections or modifications as required. CONTRACTOR shall promptly correct deficiencies as noted and resubmit another 2 copies for re-review by the ENGINEER.

1.6 ENGINEER'S ACTION

A. General: Except for Submittals for the record and similar purposes, where action and return on Submittals is required or requested, the ENGINEER will review each Submittal, mark with appropriate "Action", and where possible return within 3 days of receipt. Resubmittal and the resulting delay shall be entirely the responsibility of the CONTRACTOR. Where the Submittal must be held for coordination, the ENGINEER will so advise the CONTRACTOR without delay.

1.7 AS-BUILT (RECORD) PLANS

A. During the entire construction operation, the CONTRACTOR shall maintain records of all deviations from the Plans and Specifications and shall prepare therefrom "As-Built" Plans showing correctly and accurately all changes and deviation from the Work made during construction to reflect the Work as it was actually constructed. These Plans shall conform to recognized standards of drafting, and shall be neat and legible. The elevations and horizontal measurements shall be documented on the As-Built Plans. The As-Built shall be submitted to the ENGINEER on the design plan sheets. The ENGINEER will review the As-Built Plans, transfer the data onto CADD Plans and prepare Record Drawings before the approval of the final payment request.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01505

MOBILIZATION, DEMOBILIZATION AND DECONTAMINATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Work.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Basis of Measurement: By the lump sum. The bid shall separately identify the cost for the performance and bond.

B. Basis of Payment: Includes all labor, equipment and materials necessary to fulfill the requirements of all Division 1 Specifications.

1.3 DESCRIPTION OF WORK

A. Mobilization consists of the Work and operations necessary for the movement of personnel, equipment, supplies and incidentals to the project Site including Work and operations which must be performed or for which costs must be incurred before beginning Work on the various items on the project Site. Such items as project administration, obtaining permits, notifications and performance bonds, and preparing the Health and Safety Plan are typically included.

B. Demobilization shall include all Work and operations to vacate the Site, including movement of personnel, equipment, supplies and incidentals from the Site.

C. Decontamination of personnel clothing, equipment and disposition of decontamination wastes is an integral part of the overall Health and Safety Program. The selection of protective clothing, respirators, and equipment to prevent human contact and the spread of contaminants shall be addressed in the CONTRACTOR's Health and Safety Plan. Decontamination consists of physically removing contaminants or changing their chemical nature to innocuous substances. This item consists of all Work and operations necessary for the CONTRACTOR to safely enter and exit the Site and perform the Work contained in these Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01530

HEALTH AND SAFETY CONSIDERATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Site and Work Description.

B. Regulatory Requirements.

C. Health and Safety Considerations.

D. Health and Safety Program.

E. Trench Safety.

F. Accident Reports.

G. Complaints.

H. Fire Prevention and Protection.

I. Protection of Property.

J. Site Restoration and Cleanup.

1.2 REFERENCES

A. OSHA Regulation 29 CFR Part 1910 - Occupational Safety and Health Standards.

B. OSHA Regulation 29 CFR Part 1926 - Health and Safety Regulations for Construction.

C. Safety Guidelines for Landfills - Governmental Refuse Collection and Gas Disposal Association (GRCDA), National Landfill Gas Committee, latest edition.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Payment for the Work in this Section will be included as part of the lump sum payment for mobilization, demobilization and decontamination.

1.4 SITE AND WORK DESCRIPTION

A. The CONTRACTOR is advised that the Site is the location of a closed landfill, which operated from 1972 through 1987. During this period municipal wastes, sewage sludges, industrial and commerical wastes were accepted.

B. The purpose of this Project is to install three additional gas extraction wells and associated header piping, excavate the uncapped waste at the north boundary of the landfill and use it to regrade subsidence areas on the landfill, and cap the south perimeter ditch.

C. CONTRACTOR shall acknowledge the presence of methane gas in potentially combustible or explosive concentrations in the subsurface in and around the Site. CONTRACTOR shall take the necessary precautions to conduct Work in a safe manner.

1.5 SUBMITTALS

A. CONTRACTOR shall submit a copy of the Site specific Health and Safety Plan to the ENGINEER prior to start of Work.

1.6 REGULATORY REQUIREMENTS

A. Safety provisions shall conform to local laws, ordinances, codes, and regulations. CONTRACTOR's failure to thoroughly familiarize him/herself with the aforementioned safety provisions shall not relieve him/her from compliance with the obligations and penalties set forth therein.

1.7 HEALTH AND SAFETY CONSIDERATIONS

A. CONTRACTOR shall conduct all operations under the Contract in a manner to avoid risk of bodily harm to persons or damage to property and in full compliance with OSHA, MSHA, PRINCIPAL and ENGINEER requirements, and any and all other applicable legal requirements. Further, CONTRACTOR shall continuously inspect its Work, materials and equipment to identify any unsafe conditions and shall promptly take action to correct any condition which presents such a risk.

B. CONTRACTOR represents and warrants that it is fully qualified and knowledgeable with respect to all health and safety requirements relating to the Work and that as an independent contractor, CONTRACTOR shall be solely responsible for compliance with those requirements.

C. CONTRACTOR shall prepare a written Health and Safety Plan and submit it to ENGINEER prior to the start of any field activity.

D. CONTRACTOR shall comply with all applicable OSHA regulations. The CONTRACTOR's Health and Safety Plan does not supersede or in any way relieve the CONTRACTOR of obligations under any applicable OSHA regulations including 29 CFR 1910 and 29 CFR 1926.

E. CONTRACTOR shall do all Work necessary to protect persons from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalks or walkways, and trenches or excavations in roadways. Barricades, lanterns, and proper signs shall be furnished as necessary to insure safety.

F. The performance of all Work and all completed construction, particularly with respect to ladders, platforms structure openings, scaffolding, shoring, lagging, and machinery guards, shall be in accordance with the requirements of applicable governing safety authorities.

G. During progress of the Work, CONTRACTOR shall at all times maintain satisfactory temporary chain link fencing, solid fencing, railing, barricades, or steel plates, as applicable, at all openings, obstructions, or other hazards in roadways, sidewalks, floors, roofs, walkways, and the like. All barriers shall have adequate warning lights required for public safety.

1.8 HEALTH AND SAFETY PROGRAM

A. CONTRACTOR shall develop and implement a Health and Safety Program in accordance with this Contract and all applicable OSHA regulations, 29 CFR 1910 and 29 CFR 260 and any other applicable Federal, State or Local agency regulations or requirements.

B. CONTRACTOR shall develop, and maintain for the duration of the Contract, a Health and Safety Program that will effectively incorporate and implement, at a minimum, all required health and safety provisions. CONTRACTOR shall employ a person who is qualified and experienced in construction safety and all necessary competent assistants whose prime responsibility will be accident prevention during

construction. Such person(s) shall be at the Work Site and be authorized to supervise and enforce compliance with the Health and Safety Program.

C. CONTRACTOR shall be solely responsible for determining and providing an appropriate Health and Safety Program, including monitoring, equipment, plans in event of problems and/or emergencies and other related items as needed. CONTRACTOR shall maintain at the job Site safety equipment applicable to the Work as prescribed by the governing safety authorities, all articles necessary for giving first aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of persons who may be injured on the job Site.

1.9 EXCAVATION SAFETY

A. CONTRACTOR shall maintain a temporary barrier around the excavation at all times while open to restrict access.

B. The excavated areas may not be left open overnight for any reason.

C. CONTRACTOR shall provide a mechanical means for providing a safe breathing zone (e.g., fan, etc.).

1.10 ACCIDENT REPORTS

A. If a death, serious injury or damage occurs, the accident shall be reported immediately by telephone or messenger to the ENGINEER and to appropriate local authorities. In addition, the CONTRACTOR must promptly report in writing to the ENGINEER all accidents occurring in connection with the Work, giving full details, names, and statements of witnesses.

B. If a claim is made by anyone against the CONTRACTOR or any SUBCONTRACTOR resulting from an accident, CONTRACTOR shall promptly report the facts in writing to the ENGINEER, giving full details of the claim, including investigation and restitution.

1.11 COMPLAINTS

A. All complaints received by the CONTRACTOR shall be reported to the ENGINEER no later than the working day following receipt thereof. Such reports shall include the name, address, date and time received, date and time of action complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Each complaint shall be assigned a separate number, and all complaints shall be numbered consecutively

in order of receipt. In the event more than one complaint is received from the same complainant, each latter complaint shall show all previous complaint numbers registered by the same complainant.

B. When settlement of a claim is made, the ENGINEER shall be furnished with a copy of the release of claim by the claimant. No settlement shall be made unless such settlement also releases ENGINEER and CLIENT.

1.12 FIRE PREVENTION AND PROTECTION

A. CONTRACTOR shall execute all Work in a fire-safe manner. He shall supply and maintain on the Site adequate fire-fighting equipment capable of extinguishing incipient fires. CONTRACTOR shall comply with applicable fire-prevention laws. Where these laws do not apply, applicable parts of the NFPA No. 241 shall be followed.

1.13 PROTECTION OF PROPERTY

A. CONTRACTOR shall employ such means and methods as necessary to adequately protect all property against damage. In the event of damage to such property, CONTRACTOR shall, at his own expense, immediately restore the property to a condition at least equal to its original condition and to the satisfaction of the ENGINEER.

1.14 SITE RESTORATION AND CLEANUP

A. At all times during the Work, CONTRACTOR shall keep the premises clean and orderly; and upon completion of the Work, repair all damage caused by equipment and leave the Site free of rubbish or excess materials of any kind.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01568

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Erosion control measures necessary to prevent runoff, tracking, or loss of soil materials by water or mechanical action from disturbed portion of the Project site(s). Payment for this work is included in the mobilization/demobilization item. The CONTRACTOR shall be proactive in installing erosion control measures prior to erosion occurrence.

1.2 REFERENCES

A. State of Wisconsin Construction Site Best Management Practice Handbook, Publication WR-222-89. Copies are available by contacting:

State of Wisconsin
Department of Natural Resources
Non-Point Service and Land Management Section
101 South Webster Street
P.O. Box 7921
Madison, WI 53707-7921

and/or

Document Sales and Distribution
202 South Thornton Avenue
P.O. Box 7840
Madison, WI 53707
(608) 266-3358

B. The State of Wisconsin, Department of Transportation, Division of Highway Standard Specifications for Road and Bridge Construction (SSRBC), current edition. Wherever D.O.T. or SSRBC appears in this specification, it refers to State of Wisconsin, Department of Transportation, Division of Highways Standard Specifications for Road and Bridge Construction.

1.3 QUALITY ASSURANCE

A. All Work shall be in accordance with applicable manufacturer's instructions and local, state, and federal codes, regulations, laws, and ordinances.

B. CONTRACTOR shall comply with applicable requirements of Section 404 of Clean Water Act and Navigable Waters Protection (Chapters 30 and 31).

C. CONTRACTOR shall submit Construction Site Erosion Control Plan and meet Shoreland and Wetland Zoning requirements as required by Building Inspection Offices for cities and villages; County Land Regulations and Records Department for townships.

PART 2 PRODUCTS

2.1 MATERIALS

A. Straw Bale Barriers: Hay or straw, rectangular surfaces, and tightly bound with twine, not wire.

B. Sediment Control Fences (Silt Fence):

1. Comply with requirements of SSRBC 1628.2.9.1 and be equal to that of Mirafi 100, Trevira Spunbound 1115, Amoco 1380, or Supac 5NP, backed by industrial polypropylene netting or 18-gauge woven wire fence.

2. Fabric shall come in rolls of 3-ft. width.

3. Posts used to support fabric shall be at least 2 in. by 2 in. nominal in cross-section and of sufficient length to fully support 36-inch high fence.

PART 3 EXECUTION

3.1 GENERAL

A. Comply with manufacturer's instruction where these specifications do not specify higher requirement.

B. Undertake measures required in Contract Documents or shown on Plans or determined necessary by ENGINEER or CLIENT to protect adjacent lands, and ground and surface waters from contamination by direct and indirect migration of sands, silts, mud, debris, chemicals, and other such pollutants from Project site

through use of specified materials. Such measures shall include, but not be limited by enumeration to:

1. Construction and maintenance of erosion control barriers.

2. Construction and maintenance of surface runoff diversion channels around construction site.

3. Sweeping, shoveling, and other removal of materials from streets and other paved surfaced by hand and mechanical methods (but not flushing).

4. Removal of silts, sediments, and debris which have left job site due to erosion.

5. Restoration of lands and waters subject to damage by erosion from Project.

3.2 EROSION CONTROL MEASURES

A. Grading and Earthwork Measures:

1. Temporary or permanent erosion control measures shall be installed prior to site grading or land disturbances.

2. Stripping of vegetation, grading, excavation, or other land disturbing activities shall be done in logical sequence and manner which will minimize erosion. If possible, schedule construction for time of year when erosion hazards are minimal. Retain and protect natural vegetation in areas not designated for improvements or earthwork.

3. Soil or dirt piles which will remain in existence for more than 7 consecutive days, whether to be worked during that period or not, shall not be located within 25 ft. of roadway, parking lot, paved area, or drainage structure or channel unless intended to be used as part of erosion control measures.

4. Temporary stabilization and control measures (seeding, mulching, tarping, erosion matting, barrier fencing, etc.) are required for protection of disturbed areas and soil piles which will remain unworked for period or more than 14 consecutive calendar days.

B. Drainage Measures:

1. Site dewatering shall be undertaken in a manner to discharge the water to control areas and minimize the discharge of sediments.

C. Tracking and Sedimentation Control Measures

1. CONTRACTOR shall provide measures to prevent tracking of sediment from site onto public or private roadways, parking lots, and paved areas. Such measures shall include:

a. Prohibiting construction activities which are off of paved, graveled, or stabilized surfaces during periods of precipitation and wet soils.

b. Discharge wash water to control areas.

3.3 MAINTENANCE

A. CONTRACTOR shall inspect erosion control measures within 24 hours of end of each rainfall event, or daily during period of prolongs rainfall, or weekly during periods without rainfall. CONTRACTOR shall immediately repair or replace damaged, failed, or inadequate erosion control measures.

3.4 CLEANING AND DISPOSAL

A. Remove surplus excavation materials from site immediately after rough grading. Disposal site for surplus excavation materials shall also be subject to erosion control requirements.

B. Sediment reaching public or private roadway, parking lot, sidewalk, or other paved area and which constitutes hazard to traffic or which may be further scattered by traffic, shall be immediately and completely removed by scraping, sweeping, shoveling, or other such method (except flushing). Accumulations not requiring immediate attention shall be completely removed at least once at end of each work day.

C. Waste and unused construction materials shall be disposed of frequently and in licensed solid waste or wastewater facilities. No garbage, debris, cleaning wastes, toxic materials, or hazardous materials shall be dumped on land surface, or discharged otherwise allowed to be carried off-site by runoff into adjacent lands or into receiving waters.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Work.

B. Quality Assurance.

C. Procedures.

D. Submittals.

1.2 DESCRIPTION OF WORK

A. To provide an orderly and efficient transfer of the completed Work to the OWNER.

1.3 RELATED SECTIONS

A. Documents affecting Work of this Section include, but are not necessarily limited to General Specifications and Specific Conditions.

1.4 QUALITY ASSURANCE

A. Prior to requesting inspection by the ENGINEER, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.

1.5 PROCEDURES

A. Substantial Completion

1. Prepare and submit the list of items to be completed.

2. Within a reasonable time after receipt of the list, the ENGINEER will inspect to determine status of completion.

3. Should the ENGINEER determine that the Work is not substantially complete:

   a) ENGINEER promptly will so notify the CONTRACTOR, in writing, giving the reasons therefore.

   b) Remedy the deficiencies and notify the ENGINEER when ready for reinspection.

   c) ENGINEER will reinspect the Work.

4. When the ENGINEER concurs that the Work is substantially complete:

   a) ENGINEER will prepare a "Certificate of Substantial Completion", accompanied by the CONTRACTOR's list of items to be completed or corrected, as verified by the ENGINEER.

   b) ENGINEER will submit the Certificate to the OWNER and to the CONTRACTOR for their written acceptance of the responsibilities assigned to them in the Certificate.

B. Final Completion

1. Prepare and submit the notice that all Work is complete.

2. Verify that the Work is complete.

3. Certify that:

   a) Contract Documents have been reviewed.

   b) Work has been inspected for compliance with the Contract Documents.

   c) Work has been completed in accordance with the Contract Documents.

   d) Work is completed and ready for final inspection.

4. ENGINEER will make an inspection to verify status of completion.

5. Should the ENGINEER determine that the Work is acceptable under the Contract Documents, he will request the CONTRACTOR to make closeout Submittals.

C. Final adjustment of accounts

1. Submit a final statement of accounting to the ENGINEER, showing all adjustments to the Contract Sum.

2. If so required, the ENGINEER will prepare a final Change Order showing adjustments of the Contract Sum which were not made previously by Change Orders.

1.6 SUBMITTALS

A. Closeout Submittals include, but are not necessarily limited to:

1. Project Record Documents.

2. Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:

a) Certificates of Inspection.

b) Certificates of Occupancy.

3. Evidence of payment and release of liens.

4. List of subcontractors, service organizations, and principal Vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

B. Submit a final statement of accounting to the ENGINEER, showing all adjustment to the Contract Sum.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02110

SITE CLEARING, GRUBBING, AND STRIPPING/STOCKPILING TOPSOIL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Clearing shall consist of the cutting and disposing of undesirable trees, brush, shrubs and vegetation; removing and disposing of windfalls, logs, uprooted stumps and rubbish.

B. Grubbing shall consist of removing and disposing stumps of trees removed under the item of Clearing.

C. Topsoil Stripping and Stockpiling shall consist of the removal of topsoil from designated areas and stockpiling on-site.

1.2 RELATED SECTIONS

A. Section 02211 - General Site Grading.

B. Section 02221 - Earthwork.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Clearing and Grubbing:

1. Basis of Measurement: Clearing and Grubbing of areas of light brush, stripping and stockpiling topsoil, removing shrubs and other vegetation that can be cut with a brush scythe or mowing machine, areas containing logs, tree roots, roots of brush, shrubs and other vegetation having a woody structure that can be removed with a rooter; small trees of less than the minimum (4 inch diameter) designated for measurement under the following units; and trimming of overhanging limbs and branches to provide required clearance. The Bid item for Clearing and Grubbing will be measured by the acre as indicated in the Contract. The

areas measured for payment shall consist of areas cleared and grubbed within the limits so designated on the Plans, and shall be computed from horizontal measurements of the area bounded by the line of trunks or brush to be cut or grubbed, except that clearing or grubbing will not be measured or paid for outside the limits of the project limits. Separate areas or isolated stands less than 1/5 of an acre in size will be considered to be 1/5 of an acre.

2. Basis of Payment: The Contract unit price for Clearing and Grubbing per acre, shall be payment in full for all clearing and for all grubbing actually required and performed within the clearing limits as shown on the Plans; and for all handling, hauling, piling, chipping, oil treatment, wood treatment, rehandling and disposal of waste and debris and for stripping and stockpiling topsoil in accordance with the requirements of these Specifications.

B. Topsoil Stripping and Stockpiling

1. Basis of Measurement: Topsoil stripping and stockpiling shall be measured in cubic yards of volume as computed by the average end area method by the Surveyor.

2. Basis of Payment: The quantity, measured as provided above will be paid for at the Contract unit price per cubic yard, which price shall be full payment for furnishing all labor, equipment and materials associated with stripping the topsoil from designated areas and stockpiling.

1.4 REGULATORY REQUIREMENTS

A. Conform to WDNR regulations for disposal of debris on-site.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing plant life designated to remain, is tagged or identified.

B. Public or private owners holding underlying title to lands shall have a prior right to all timber from trees standing or lying thereon, except such timber as may be required for construction of the Work.

C. Stumps, roots, brush, waste logs and limbs, timber tops and debris resulting from clearing and grubbing or occurring within the clearing limits shall be disposed of by chipping and stockpiling at a site within the project limits.

3.2 PROTECTION

A. Protect trees, plant growth, and features designated to remain, as final landscaping.

B. Protect bench marks and existing structures from damage or displacement.

3.3 CLEARING

A. Except as hereinafter set forth, clearing and grubbing shall take place in the areas shown on the Plans.

B. Unless specifically designated otherwise on the Plans, or by the ENGINEER, all trees, brush, shrubs or other vegetation occurring within the limits defined above shall be cut off and disposed of as provided herein. All stumps, roots, logs or timber and all brush, matted roots and debris shall be removed to the original ground surface in embankment areas. In cut areas such material shall be removed to a depth of not less than 12 inches below the subgrade. CONTRACTOR shall be responsible for the proper disposal of all trees, brush, or shrubs cleared. All other cleared vegetative matter shall be placed in the waste placement areas.

3.4 STRIPPING AND STOCKPILING OF TOPSOIL

A. Existing topsoil located within the areas to be disturbed shall be stripped and stockpiled in an area to be designated by the ENGINEER.

END OF SECTION

SECTION 02211
GENERAL SITE GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Specification covers all earthwork operations related to this project, including, but not limited to: general excavation and placement of soil in designated areas within the project limits and grading relating to developing the required slopes for the subgrade of the low permeability cap and the south perimeter ditch.

1.2 RELATED SECTIONS

A. Section 02110 - Site Clearing, Grubbing, and Stripping/Stockpiling Topsoil.

B. Section 02220 - Replacement of Low Permeability Cap.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENTS

A. General Site Grading

1. Basis of Measurement:	General site grading will consist of excavation and placement of soil in designated areas of the project. General site grading shall be measured by the quantity of excavated soil calculated by the average end area method in cubic yards for soil excavated, placed, and compacted in designated areas.
2. Basis of Payment:	The quantity, measured as provided above will be paid for at the Contract unit price per cubic yard, which price shall be payment in full for furnishing all labor, tools, equipment and incidentals necessary to complete the excavating, sorting, screening for contamination, stockpiling, shaping, placing, moisture conditioning, and compacting of on-site soil.

B. South Perimeter Ditch Reconstruction

1. Basis of Measurement	Lump Sum.

2. Basis of Payment

The lump sum bid shall be payment in full for furnishing all labor, tools, equipment and incidentals necessary to complete the excavating, stockpiling, shaping, placing, moisture conditioning, and compacting of soils as required to reconstruct the south perimeter ditch.

PART 2 PRODUCTS

2.1 UNSUITABLE MATERIALS

A. Includes all materials that contain debris, roots, brush, sod, organic or frozen materials, materials classified in ASTM D 2487 as MH, PT, OH, and OL, stone having a maximum dimension larger than 4-inches in the fill unless otherwise specified and materials that are determined by the ENGINEER as unsuitable for providing a stable subgrade or foundation for structures. Otherwise suitable material which is unsuitable due to excess moisture content will not be classified as unsuitable material unless it cannot be dried by manipulation, aeration, or blending with other materials satisfactorily as determined by the ENGINEER. The ENGINEER has the right to reject material prior to placement if the material is hauled on-site in a saturated or watered down state. Under no circumstances shall frozen earth, snow, or ice be placed in the select fill. No placement shall be permitted on frozen material.

2.2 COHESIONLESS AND COHESIVE MATERIALS.

A. Cohesionless materials are defined as materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials are defined as materials classified as GC, SC, ML, CL, and CH. Materials classified as GM and SM will be identified as cohesionless when the fines are non-plastic, and cohesive when the fines are plastic.

PART 3 EXECUTION

3.1 PREPARATION FOR WASTE PLACEMENT

A. All surface vegetation, such as brush, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsuitable material within the area upon which fill is to be placed shall be treated according to Section 02110, Site Clearing and Grubbing, before the fill is started.

B. As the topsoil is removed and stockpiled, subgrade soils shall be excavated to the surface of the previously placed waste.

3.2 PROOFROLLING PRIOR TO PLACEMENT OF FINAL COVER MATERIALS

A. The regraded subgrade soils shall be compacted or otherwise prepared as required to provide a foundation which will permit attaining the density specified for the low permeability cap. Any soft spots which are found shall be excavated and backfilled with suitable borrow soil.

3.3 GRADING OF SUBSIDENCE AREAS AND SOUTHERN PERIMETER DITCH

A. Existing subgrade soils shall be regraded as shown on the Plans, and/or as directed by the ENGINEER, to develop the minimum required grades prior to placement of low permeability cap materials.

B. Dewatering: Excavation for trenches and drainage structures shall be performed so that the excavation will be continually and effectively drained. Water shall not be permitted to accumulate in any excavation. The excavation shall be drained by pumping or other satisfactory methods to prevent softening of the bottom, undercutting, or other actions detrimental to proper construction procedures. CONTRACTOR shall dispose of any such water in accordance with all local, State, and Federal regulations. Prior to dewatering, CONTRACTOR shall submit his dewatering plan to the ENGINEER for review.

3.4 FIELD INSPECTION, LAYOUT AND COMPACTION TESTING

A. CONTRACTOR shall provide the ENGINEER with adequate notice of construction activities, to allow the ENGINEER time to coordinate the layout and assist in the staking of the Work with CONTRACTOR's surveyor.

B. Standard Compaction:

1. As site grading progresses, excavated soil shall be deposited, spread and leveled in designated areas, as provided herein, in layers generally not exceeding eight inches in thickness before compaction. Each layer of fill shall be compacted to a minimum of 90% of the modified Proctor density.

2. The compaction shall be performed by specialized compaction equipment, supplemented by hauling and leveling equipment routed and distributed over each layer of the fill to make use of the compaction afforded thereby; unless the ENGINEER determines that the compaction attained by the use of only the hauling and leveling equipment is satisfactory and sufficient. Should the ENGINEER determine that such compaction is satisfactory and sufficient,

specialized compaction equipment will not be required. Should the ENGINEER determine that the compaction is not satisfactory or sufficient, specialized compaction equipment shall be used to accomplish the compaction.

3. Specialized compaction equipment shall include tamping rollers, pneumatic-tire rollers, sheepsfoot rollers, vibratory rollers, or other types of equipment designed for compaction, which will produce the required results in the materials encountered and be subject to the approval of the ENGINEER.

4. Tamping rollers, when used for compaction, shall exert a weight of not less than 150 pounds per square inch of tamping surface on each tamping foot in a traverse row.

5. Pneumatic-tire rollers or other equipment, when used for compaction, shall have a weight of not less than 150 pounds per linear inch of overall rolling width.

6. Tests to determine the density of the fill will be performed as needed at the discretion of the ENGINEER. The CONTRACTOR shall cooperate with the ENGINEER in conducting these tests.

C. Compaction testing will be performed in accordance with ANSI/ASTM D1556 or ASTM D2922.

D. If tests indicate Work does not meet specified compaction requirements, CONTRACTOR shall remove Work, replace and retest at CONTRACTOR's own expense.

E. Fill material shall not be compacted when the moisture content is such as to cause excessive rutting by the hauling equipment, or excessive displacement or distortion under the compacting equipment. Where such conditions exist, the materials shall be allowed to dry prior to compacting. When necessary, drying of such materials shall be accelerated by aeration or manipulation by means of blade graders, harrows, discs, or other appropriate equipment.

F. When the fill material does not contain sufficient moisture to compact properly, water shall be added in quantities deemed necessary to aid and accelerate and to secure effective compaction.

3.6 SEGREGATION OF EXCAVATED SOILS

A. The excavated soils shall be placed in stockpiles based on type of soils.

3.7 STOCKPILING OF EXCAVATED SOILS

A. Stockpiles shall be lined with plastic and constructed at areas designated by the ENGINEER. Silt fence shall be installed around the base of the stockpiles.

B. The stockpiles will be sampled by the ENGINEER to determine whether they can be used for replacement of the clay cap, or for general fill above the clay cap.

3.8 PLACEMENT OF EXTRACTED SOILS ABOVE CAP

A. Soils which are determined to be acceptable, shall be used in the 30-inch thick layer of general fill (rooting layer) over the low permeability cap.

END OF SECTION

SECTION 02220

REPLACEMENT OF LANDFILL CAP

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Replacement of the landfill cap for areas where waste is covered consisting of (from bottom to top): 24 inches of compacted clay, 30 inches of drainage and rooting zone material, and 6 inches of topsoil. The landfill cap shall be reinstalled over any disturbed area containing refuse, including lateral pipe inspection areas.

B. Replacement of landfill cap along the southern perimeter ditch consisting of (from bottom to top): 24 inches of compacted clay, 18 inches of drainage and rooting zone material, and 6 inches of topsoil. The soils for the landfill cap shall be installed along the south perimeter ditch. Movement of the south perimeter fence will be necessary to install ditch.

1.2 RELATED SECTIONS

A. Section 01568 - Erosion and Sediment Control.

B. Section 02211 - General Site Grading.

C. Section 02221 - Earthwork.

D. Section 02920 - Site Cleanup and Restoration.

1.3 REFERENCES

A. ASTM D 422 - Standard Test Method for Particle-Size Analysis of Soils.

B. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ASTM D1557 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 kg) Rammer and 18 inch (457 mm) Drop.

D. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

E. ASTM D2487 - Standard Test Method for Classification of Soils for Engineering Purposes.

F. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

G. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 MEASUREMENT AND PAYMENT

A. Basis of Measurement: Replacing Low Permeability Soil and General Fill Material (Rooting Layer) will be measured in cubic yards of volume placed as computed by the average end area method by the Surveyor. A licensed surveyor shall be subcontracted to perform all surveys necessary to accurately establish pay quantities. Placement of soils excavated from the site will be paid for under Section 02211.

B. Basis of Payment: The quantity, measured as provided above will be paid for at the contract unit price per cubic yard, which price shall be full payment for furnishing all labor, equipment and materials associated with testing, excavating, loading, hauling, placing, moisture conditioning, and compacting of the Low Permeability Cap materials.

1.5 SUBMITTALS

A. Copies of all laboratory tests results shall be submitted to ENGINEER for review and acceptance prior to borrow soils being hauled to the project site.

PART 2 PRODUCTS

2.1 CLAY BORROW

A. Clay borrow material needed to re-establish the 2-foot thick clay barrier layer of the landfill cap shall meet the requirements of s. NR 504.06, WAC and consist of:

- A minimum 50% by weight which passes the 200 sieve;
- An average liquid limit of 25 or greater;
- An average plasticity index of 12 or greater; and

- A saturated hydraulic conductivity equal to or less than $1x10^{-7}$ cm/sec., when compacted to required moisture contents and densities based on the modified Proctor method.

B. It shall be the CONTRACTOR'S responsibility to provide the clay borrow free of any organic material or foreign matter which would cause the material not to meet the specification described above. Any material not meeting Specifications will be rejected.

C. CONTRACTOR shall obtain the acceptable clay soil from an approved local source meeting the minimum requirements of s. NR 512 WAC.

2.2 GENERAL FILL MATERIAL AND OFFSITE GENERAL FILL MATERIAL

A. The 30-inch rooting layer of soil above the clay cap shall consist of both onsite soils excavated and stockpiled during cap preparation activities, and imported general fill material, if required to establish final grades.

B. General imported fill material shall consist of satisfactory soil or a mixture of satisfactory soil, stone, gravel or other acceptable materials which is of a character and quality satisfactory for the purpose intended. The material shall be free from sod, stumps, logs, grubs and other perishable and deleterious matter. Suitable borrow material shall consist of one hundred percent of the material by weight passing the 3-inch sieve, and not less than thirty percent passing the #200 sieve.

2.3 TOPSOIL

A. Refer to Sections 02110 and 02920 of these Specifications.

PART 3 EXECUTION

3.1 REPLACING EXISTING LOW PERMEABILITY CAP MATERIAL

A. Move south perimeter fence prior to installation of ditch. Replace fence after ditch installation is complete.

B. After regrading according to plans, place previously stripped cap materials conforming to contours and elevations as detailed in the Plans or as directed by the ENGINEER. If necessary, add borrow clay to obtain two feet minimum clay layer.

C. The cap shall be replaced in layers by spreading and leveling the material during placement. The thickness of the layer shall be as necessary to secure the required compaction, generally not exceeding 8 inches loose.

D. Make grade changes gradual. Blend slope into existing grades along the perimeter of the low permeability cap.

3.2 GENERAL FILL MATERIAL LAYER

A. For subsidence area restoration, first place excavated refuse and/or soil materials and compact.

B. If necessary, place additional imported fill soils to bring area up to the grades shown on the plans or as directed by the ENGINEER.

C. Coordinate with Surveyor to assure that elevations for volume computations and for documentation purposes are taken.

D. Place imported general fills, in maximum 8-inch loose, 6-inch compacted lifts.

3.3 COMPACTION

A. CONTRACTOR shall adequately control his compaction operations in accordance with ASTM D 1556, ASTM D 2167 and ASTM D 2922 during placement of materials within the limits of densities specified.

B. Maintain optimum moisture content of fill materials to attain required compaction density. This shall include moisture conditioning of materials to bring the moisture content within the range required to achieve 90 percent of modified Proctor density. It is preferable that soils be compacted on the wet side of optimum.

C. CONTRACTOR shall be responsible for performing and recording field density checks of each lift placed and compacted. This density testing shall be performed under the observation of the ENGINEER. If the testing indicates that the required densities are not being achieved, the materials shall be recompacted until density is achieved.

D. When the cap material does not contain sufficient moisture to compact properly, water shall be added in quantities deemed necessary to aid and accelerate and to secure effective compaction.

E. The compaction shall be performed by specialized compaction equipment, supplemented by hauling and leveling equipment routed and distributed over each layer of the fill to make use of the compaction afforded thereby; unless the

ENGINEER determines that the compaction attained by the use of only the hauling and leveling equipment is satisfactory and sufficient. Should the ENGINEER determine that such compaction is satisfactory and sufficient, specialized compaction equipment will not be required. Should the ENGINEER determine that the compaction is not satisfactory or sufficient, specialized compaction equipment shall be used to accomplish the compaction.

F. Specialized compaction equipment shall include tamping rollers, pneumatic-tire rollers, sheepsfoot rollers, vibratory rollers, or other types of equipment designed for compaction, which will produce the required results in the materials encountered and be subject to the approval of the ENGINEER.

G. Tamping rollers, when used for compaction, shall exert a weight of not less than 150 pounds per square inch of tamping surface on each tamping foot in a traverse row.

H. Pneumatic-tire rollers or other equipment, when used for compaction, shall have a weight of not less than 150 pounds per linear inch of overall rolling width.

I. Tests to determine the density of the fill will be performed as needed at the discretion of the ENGINEER. The CONTRACTOR shall cooperate with the ENGINEER in conducting these tests.

3.4 CLASSIFICATION AND MOISTURE-DENSITY DETERMINATIONS

A. Tests for determination of maximum density and optimum moisture for all off-site materials secured by the CONTRACTOR shall be in accordance with the requirements of the standard compaction test in ASTM D 1557. A classification and moisture-density curve or maximum density determination shall be obtained for each principal type of material or combination of materials encountered or utilized. Results of these tests shall be the basis of control for compaction of the low permeability cap soils. The above testing shall include Atterberg limits, grain size determination (sieve and hydrometer analyses) and specific gravity. These tests are described in ASTM D 4318, ASTM D 1140, ASTM D 422 and ASTM D 854, respectively. Classification testing shall be done at a rate of one test per 1,000 cubic yards of borrow excavation. Samples shall be representative of the material placed. Copies of all tests for classification and control of density and moisture shall be furnished to the ENGINEER in advance of the time the representative materials are to be placed.

3.5 TOPSOIL PLACEMENT

A. After the areas upon which the topsoil is to be placed have been prepared and finished to the required lines, grades, slopes and cross section, the salvaged topsoil and imported topsoil as needed, shall be placed and spread thereon to a uniform depth as

shown on the Plans or required in the Contract, or if none is so shown, to a depth of 6 inches or such greater depth as shown on the Plans or designated by the ENGINEER.

B. Remove foreign materials, weeds and undesirable plants and their roots.

C. All clods and lumps shall be broken down by means of harrows, discs, or other appropriate equipment to provide a uniformly textured soil. The entire surface shall be dressed to present a uniform appearance. Rolling will not be required.

3.6 FINISHED SURFACE

A. All areas covered by the project shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. All areas shall be finished so as to drain readily.

B. As-built surveys of the completed fill shall be completed by the CONTRACTOR.

3.7 FINAL CAP PROTECTION

A. During construction, the low permeability cap shall be kept shaped and drained. Where ruts occur, the final cover shall be brought to grade, reshaped if required, and recompacted prior to the placing of additional fill.

END OF SECTION

SECTION 02221

EARTHWORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This Section specifies the methods to be followed for earthwork operations related to the excavation of uncapped waste at the north end of the landfill, and excavation and backfilling during installation of the Gas Migration Control System.

1.2 RELATED SECTIONS

A. Section 02110 - Site Clearing, Grubbing and Stripping/Stockpiling of Topsoil.

B. Section 02220 - Replacement of Landfill Cap.

C. Section 15675 - Gas Extraction Wells.

D. Section 15680 - Gas Extraction System.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Waste Excavation

1. Basis of Measurement: The volume of waste excavated shall be measured in cubic yards as computed by the average end area method by the Surveyor.

2. Basis of Payment: The quantity, measured as provided above will be paid for at the Contract unit price per cubic yard, which price shall be full payment for furnishing all labor, equipment and materials needed to excavate, haul and place waste in the designated areas within the capped landfill.

B. Select Granular Material

1. Basis of Measurement: By the cubic yard in place. Select Granular Material shall be measured in place as the actual cubic yards placed in the trench bottoms.

2. Basis of Payment: Unit price per cubic yard shall include furnishing

and placing the Select Granular Material, and other incidentals necessary to complete the Work.

C. On-site Disposal of Drummed Soils

1. Basis of Measurement: The number of drums requiring disposal in the landfill shall be as counted in the field.

2. Basis of Payment: The quantity, measured as provided above will be paid for at the Contract unit price per drum, which price shall be full payment for furnishing all labor, equipment and materials needed to haul, place and crush drums in the designated areas within the capped landfill.

1.4 GENERAL QUALITY CONTROL TESTING

A. Quality Control sampling and testing shall be the responsibility of the CONTRACTOR and shall be performed at no additional cost to the ENGINEER or OWNER. Quality control sampling and testing during construction shall be performed as required in Paragraph 3.7: Testing in this Section.

1.5 DEFINITIONS

A. Satisfactory Materials

1. Subgrade.

a. Trenches: Unsatisfactory materials for the subgrade of trenches shall be those materials classified in Pt, OH, OL, FILL (where designated on the logs without Unified Soils Classification Symbol), or combinations thereof. Unsatisfactory materials shall also include those materials containing roots and other organic matter, trash, debris, frozen materials, stones larger than 3 inches, and unstable and unyielding materials as defined hereinafter.

B. Unyielding Material

1. Unyielding material shall consist of rock and gravelly soils with stones greater than 3 inches, in any dimension.

C. Unstable Material

1. Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenance structure. Landfill trash is also considered unstable material for support of piping.

D. Degree of Compaction

1. Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D1557, Method D, referred to hereinafter as percent laboratory maximum density.

1.6 SUBMITTALS

A. Copies of all laboratory and field test reports shall be submitted to ENGINEER within 24 hours of the completion of the test and prior to use.

PART 2 PRODUCTS

2.1 MATERIALS

A. Select Granular Material

1. Select Granular Material shall consist of well-graded sand, gravel, crushed gravel, or crushed stone, and shall not contain more than 15 percent by weight of materials passing the 3-inch sieve and no less than 25 percent by weight passing the No. 4 sieve, and not more than 10 percent by weight passing the No. 200 sieve.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavation of every description and of any substances encountered shall be performed to the lines and grades indicated. Excavated soil from subsidence area excavations (IB-1, IB-2, IB-3, IB-4, IB-7, IB-9 and IB-10) shall be segregated and stockpiled on site and used as backfill above the waste placed. The excavated soils, once replaced, will be part of the existing cover.

B. Subsidence Area Excavation

1. Segregation of Materials: During excavation of the subsidence areas, soils shall

be removed in layers and segregated according to type of soil. Separate stockpile areas for topsoil, cover soils and clay shall be established prior to the start of the excavation. It is the responsibility of the CONTRACTOR to ensure that the clay material does not contain other cover soil material. If necessary, additional borrow clay shall be added after regrading of the subsidence areas to maintain the two-foot minimum thickness of the compacted clay barrier layer.

2. Bottom Preparation: The bottoms of subsidence areas shall be accurately graded using the excavated waste and a layer of satisfactory material, to the grade provided on the plans.

C. Trench Excavation: The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below and above the top of the pipe shall be made vertical, as shown on the Plans. The trench width below the top of the pipe shall not exceed that recommended in the installation manual.

1. Bottom Preparation: The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Stones of 3 inches or greater in any dimension, or as recommended by pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

2. Removal of Unyielding Material: Where overdepth is not indicated and unyielding material is encountered in the bottom of the trench, such material shall be removed 4 inches below the required grade and replaced with satisfactory materials as provided in Paragraph 3.3.

3. Removal of Unstable Material: Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with Select Granular Material as provided in Paragraph 3.3. When removal of unstable material is required due to the fault or neglect of the CONTRACTOR in his performance of the Work, the resulting material shall be excavated and replaced by the CONTRACTOR without additional cost to the ENGINEER or OWNER.

4. Removal of Unsatisfactory Material: Unsatisfactory material encountered beyond the depths indicated shall be removed and replaced with satisfactory material as directed; payment therefore will be made at the Contract unit price. Determination of elevation of approved overdepth excavations shall be done in the presence of the ENGINEER.

D. Shoring: Shoring, including sheet piling, shall be furnished and installed as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Shoring, bracing, and sheeting shall be removed as excavations are backfilled, in a manner to prevent caving.

E. Dewatering: Excavation shall be performed so that the excavation will be continually and effectively drained. Water shall not be permitted to accumulate in any excavation. The excavation shall be drained by pumping or other satisfactory methods to prevent softening of the bottom, undercutting, or other actions detrimental to proper construction procedures. CONTRACTOR shall dispose of any such water in accordance with all local, State, and Federal regulations.

3.2 EXCAVATING EXISTING WASTE

A. CONTRACTOR shall excavate existing waste during the removal of uncapped waste on the north end of the landfill property. While working in waste, equipment operators may be exposed to hostile environment, such as landfill gas. CONTRACTOR is responsible for providing safe working conditions and proper equipment to handle the potentially hostile environment.

B. CONTRACTOR shall be responsible for hauling the excavated waste to designated subsidence areas or locations on the landfill where it shall be placed and compacted.

C. In the areas designated by the ENGINEER to receive the waste, the CONTRACTOR shall excavate the existing cover soils, expose the previously placed waste, spread and compact the newly placed waste in lifts, not exceeding 2 feet in thickness, on top of the older waste.

3.3 BEDDING AND BACKFILLING OF UNCAPPED WASTE AND SUBSIDENCE AREAS

A. Six inches of Select Granular Material shall be placed on top of the replaced waste in the subsidence area excavation and compacted prior to placement of clay.

B. Other areas shall be backfilled with General Fill Material to the grade shown on the Plans.

C. Replacement of Clay Material: Clay removed from the base of the subsidence area prior to regrading or from a clay borrow source shall be replaced and recompacted after placement of the uncapped waste, as described in Section 02220.

D. Replacement of Remaining Cover Soils: Remaining cover soil material removed from the subsidence areas shall be replaced in 6-inch loose lifts and recompacted.

E. All backfilling in subsidence areas and previously excavated waste areas shall be compacted in layers. Compacted layers shall be 6 inches.

F. Compaction of the backfill shall be performed with equipment suitable for achieving a minimum density of 90% modified Proctor maximum dry density, as obtained in the laboratory.

G. Backfill shall be compacted in maximum one foot loose lifts with a minimum of three passes with a vibratory compactor. Compaction techniques will be visually monitored by the ENGINEER. If compaction techniques are not acceptable to the ENGINEER, the CONTRACTOR shall be responsible for the costs to hire an independent testing firm to test the fill to obtain maximum Proctor density, and for testing the backfilled soils with a nuclear density gauge.

3.4 DISPOSAL OF DRUMMED SOILS

A. CONTRACTOR shall consolidate all drums containing soil into designated disposal areas within the capped landfill. The drums shall be emptied of their contents and crushed in-place.

3.5 BEDDING AND BACKFILLING PIPE TRENCHES

A. Six inches of Select Granular Material shall be placed in the bottom of the trench and compacted prior to placement of pipe.

B. Pipe trenches shall be backfilled with Select Granular Material to the grade shown on the Plans.

C. Replacement of Unyielding Material: Unyielding material removed from the bottom of the trench shall be replaced with Select Granular Material.

D. Replacement of Unstable Material: Unstable material removed from the bottom of the trench or excavation shall be replaced with Select Granular Material placed in layers not exceeding 6 inches loose thickness.

E. Backfill around piping shall be brought up evenly on all sides.

F. All backfilling in pipe trenches shall be compacted in layers. Compacted layers shall be 6 inches up to the pipe spring line and 12 inches thereafter.

G. Compaction of the backfill shall be performed with equipment suitable for achieving a minimum density of 90% modified Proctor maximum dry density.

H. Trench backfill placed above the pipe shall be compacted in maximum one foot loose lifts with a minimum of three passes with a vibratory compactor. Compaction techniques will be visually monitored by the ENGINEER. If compaction techniques are not acceptable to the ENGINEER, the CONTRACTOR shall be responsible for the costs to hire an independent testing firm to test the fill to obtain maximum Proctor density, and for testing the backfilled soils with a nuclear density gauge.

3.6 TIMING

A. Gas extraction wells shall be constructed prior to the installation of the gas header, leachate pumps, and electrical conduit. If the record locations of the wells are different than proposed, the header system location shall be modified accordingly, as approved by ENGINEER.

3.7 CONSTRUCTION TOLERANCES

A. On the horizontal plane, the excavation and regrading of subsidence areas and gas extraction system features shall be performed to a tolerance of ±0.5 foot from that shown on the Plans.

B. On the vertical plane, the excavation and regrading of subsidence areas and the installation of gas header piping shall be performed to a vertical tolerance of ±0.1 foot from that shown on the Plans. The gas header pipe slope shall not be less than that shown on the Plans.

3.8 TESTING

A. Testing of Select Granular Materials shall be the responsibility of the CONTRACTOR and shall be performed at no additional cost to the ENGINEER or OWNER. Sieve analyses shall be performed in accordance with ASTM C 117, C 136, and D 422; sieves shall conform to ASTM E 11. Copies of test results shall be furnished to the ENGINEER. The following minimum testing is required: One sieve analysis per 1,000 L.F. or fraction thereof of trench shall be provided.

B. See Section 3.3 for compaction testing discussion.

END OF SECTION

SECTION 02920

SITE CLEANUP AND RESTORATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Work.

B. Restoration of Utilities.

C. Site Cleanup/Restoration of Vegetation.

1.2 DESCRIPTION OF WORK

A. Furnish labor, material, and equipment to minimize damage to any and all existing utilities, personal property or lands that may occur as a result of the Work. Replace salvaged topsoil, place additional imported topsoil as needed, and apply seed, fertilizer, and mulch to all disturbed areas. Restore the gravel road to its pre-construction condition or replace any damaged items. Provide a clean Site at the completion of construction.

1.3 RELATED SECTIONS

A. Section 01000 - General Specifications.

B. Section 01002 - Specific Conditions.

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Salvaged Topsoil

1.	Basis of Measurement:	By the cubic yard for a nominal 6 inches of depth. In areas where a greater depth of topsoil is required, the measured amount will be prorated for payment depending on the depth placed.
2.	Basis of Payment:	Includes stripping, stockpiling, placing, spreading, and finishing of salvaged topsoil to a depth of 6 inches.

B. Imported Topsoil

1. Basis of Measurement: By the cubic yard for a nominal 6 inches of depth. In areas where a greater depth of topsoil is required, the measured amount will be prorated for payment depending on the depth placed.

2. Basis of payment: Includes furnishing, hauling to Site, placing, spreading, and finishing of topsoil to a depth of 6 inches.

C. Site Cleanup and Restoration.

1. Basis of Measurement: Lump Sum.

2. Basis of Payment: Includes all work to restore the site to pre-construction conditions, including placing seed, fertilizer, and mulch over disturbed areas. Also included is the restoration of the gravel road along the north-northwest landfill boundary.

1.5 REFERENCES

A. Wisconsin Department of Transportation Standard Specifications for Road and Bridge Construction.

PART 2 PRODUCTS

2.1 TOPSOIL

A. Topsoil: Screened sandy loam.

B. Salvaged Topsoil: Natural loam, sandy loam, silty clay loam, or clay loam humus bearing soils existing in place, previously removed and stockpiled during clearing operations.

2.2 SEED, MULCH AND FERTILIZER

A. The disturbed areas shall be seeded, fertilized, and mulched, according to Wisconsin Department of Transportation specifications.

1. Seeding.

a. Seed Mixture No. 40 in accordance with Wisconsin Department of Transportation Standard Specifications shall be used in the appropriate locations shown on the Plans and as directed by the ENGINEER.

b. Apply at a rate of 3 pounds per 1000 square feet.

2. Mulch: Straw or hay, free from weeds, foreign matter detrimental to plant life, and dry. Chopped cornstalks are not acceptable. Place to a depth of ½-1 inch and secure by any of the approved Wisconsin Department of Transportation methods:

a. Method A

1). The mulching material shall be uniformly spread over the designated areas to a loose depth of ½ to 1 ½ inches. The mulch material from compacted bales shall be well loosened or made fluffy before being spread in place. Unless otherwise directed, mulching operations shall begin at the top of the slopes and proceed downward.

2). Straw or hay mulch shall be securely anchored by the use of an approved netting securely pegged or stapled in place. In lieu of such anchorage, the mulch may be secured by means of heavy biodegradable twine fastened by pegs or staples to form a grid of from six to ten feet spacing.

3). Approved erosion control blankets or mats may be used in lieu of separate applications of mulch and netting.

b. Method B

1). Straw or hay shall be treated with an approved non-asphaltic binding material blown from a machine and uniformly deposited over designated areas in one operation.

2). Straw or hay mulch shall be placed uniformly over the area to a depth of ½ to 1 inch using 1½ to 3 tons of mulch per acre and the manufacturer's recommended application rate of non-asphaltic binder per ton of straw or hay. Within the above-designated limits, the ENGINEER will determine, on the job, the rate of application of the mulch and the binding materials, and the ENGINEER may vary the rates during mulching operations to produce the desired results.

3). The machine for placing the mulch shall be of an approved type which will blow or eject by constant air stream a controlled amount of mulch and which will introduce into the air stream a spray of non-asphalt mulch binding materials to partially coat the straw or hay, producing a spotty tack sufficient to hold together and retain in place the deposited straw or hay.

4). Approved non-asphaltic mulch binding materials shall be applied simultaneously with the mulch when approved by the ENGINEER or as an overspray. The binding materials shall be mixed and applied with suitable equipment in accordance with the manufacturer's instructions, except that the ENGINEER may vary the rate of application to achieve the desired results.

c. Method C

1). The straw or hay mulch shall be uniformly spread over the designated areas to a loose depth of ½ to 1 ½ inches using 1 ½ to 3 tons of mulch per acre, by blowing from a machine, as described in Method B, or by other approved methods.

2). Immediately after spreading, the mulch shall be anchored in the soil by the use of a mulch tiller consisting of a series of dull, flat discs with notched edges. The discs shall be approximately 20 inches in diameter and shall be spaced at about eight-inch centers. The tiller shall be equipped with a ballast compartment to permit adjustment of the weight for depth control.

3). The mulch shall be impressed in the soil to a depth of approximately 1 ½ to 2 ½ inches in one pass of the tiller

traveling longitudinally. Mulch tillers shall not be operated on slopes so steep that damage to the mulch, seedbed or soil occurs. The mulch on such areas shall be anchored by either Method A or Method B. Tractors shall be equipped and operated to minimize the disturbance or displacement of the soil. More than one pass of the tiller may be required to assure adequate anchoring of the mulch.

d. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil. Apply water as needed throughout the project duration until Final Acceptance.

3. Fertilizer.

a. Type B fertilizer shall be used, and shall meet the following minimum requirements:

Nitrogen, not less than	16%
Phosphoric Acid, not less than	6%
Potash, not less than	24%

Sum of nitrogen, phosphoric acid and potash shall be not less than 50 percent.

b. Apply fertilizer at a rate of 7 pounds per 1,000 square feet.

PART 3 EXECUTION

3.1 PREPARATION OF TOPSOIL/SALVAGED TOPSOIL

A. After the areas upon which the topsoil is to be placed have been prepared and finished to the required lines, grades, slopes and cross section, the topsoil shall be placed and spread thereon to a uniform depth as shown on the Plans or required in the Contract, or if none is so shown, to a depth of 6 inches or such greater depth as shown on the Plans or designated by the ENGINEER.

1. Remove foreign materials, weeds and undesirable plants and their roots.

2. All clods and lumps shall be broken down by means of harrows, discs, or other appropriate equipment to provide a uniformly textured soil. The entire surface shall be dressed to present a uniform appearance. Rolling will not be required.

3.2 RESTORATION OF UTILITIES

A. CONTRACTOR shall be responsible for and correct all damage (at his sole expense) to any gravel roadways, pavement, landscaping, fences, buildings, telephone or other cables, overhead and under ground electric power lines water mains, sanitary sewers, or their structures which he may damage as a result of his construction, whether or not the item is shown on the Plans.

B. Information shown on the Plans as to the location of existing utilities has been prepared from the most reliable data available to the ENGINEER. This information is not guaranteed, however, and it shall be the CONTRACTOR's responsibility to determine the location, character, and depth of any existing utilities. He shall assist the utility companies, by every means possible, to determine said locations including the digging of test pits as may be required to definitely locate underground utilities. Extreme caution shall be exercised to eliminate the possibility of any damage to existing utilities resulting from his activities.

3.3 SITE CLEANUP

A. During the Work, the construction areas shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipe structures, due to Work done under this Contract, or elsewhere during the course of the CONTRACTOR's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the Work, and the ditches, channels, drains, pipes, structures, etc., shall, upon completion of the Work, be left in a clean and neat condition.

C. On or before the completion of the Work, CONTRACTOR shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary Works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition, including the gravel access road.

D. CONTRACTOR shall thoroughly clean all materials and equipment installed by him and his SUBCONTRACTORS, and on completion of the Work shall deliver

it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.

E. CONTRACTOR shall restore or replace, when and as directed, any public or private property damaged by his Work, equipment, or employees, to a condition at least equal to the existing immediately prior to the beginning of operations. To this end the CONTRACTOR shall do as required all necessary highway or driveway walk, and landscaping Work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as Work progresses and shall not be left until the end of the Contract period.

F. At all times during the Work, CONTRACTOR shall keep the premises clean and orderly; and upon completion of the Work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

G. CONTRACTOR shall stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, shrubbery, or fences; remove all excavated materials from grassed and planted areas and leave these surfaces in a condition equivalent to their original condition. Once soil testing is completed, all excavated soil becomes the property of the CONTRACTOR.

3.4 FINISHING OF SITE AND STORAGE AREAS

A. Upon completion of the project, all areas used by the CONTRACTOR shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the adjoining property.

B. The Site shall be returned to pre-construction conditions; similar grades shall be achieved and similar surficial materials shall be placed.

3.5 REVEGETATION OF DISTURBED AREAS

A. Upon completion of the Work, the CONTRACTOR shall spread and level in all disturbed areas the salvaged topsoil stockpiled prior to construction. The topsoil shall be hand-raked and dragged. Disturbed areas shall be free from rocks, gravel, clay, or any other foreign material. The finished surface shall conform to the original surface, and shall be free-draining and free from holes, ruts, rough spots, or other surface features detrimental to a seeded area.

3.6 REPLACEMENT OF THE EXISTING GRAVEL ROAD

A. The gravel road along the north boundary of the landfill shall be backfilled with acceptable soils, regraded, and restored if excavation of the uncapped waste disturbs the road.

END OF SECTION

SECTION 15675

GAS EXTRACTION WELLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials.

B. Drilling of Gas Extraction Wells.

C. Well Installation, Backfilling and Compaction.

D. Waste Disposal.

E. False Starts.

1.2 RELATED SECTIONS

A. Section 02221 - Earthwork.

B. Section 15680 - Gas Extraction System.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Gas Extraction Wells.

1. Basis of Measurement: Shall be paid by the vertical foot of well installed, measured from the bottom of well to the top end of the PVC piping.

2. Basis of Payment: Includes all excavation, drilling, false starts, boring materials, including well piping and all backfill materials, and installation of gas extraction wells.

1.4 REFERENCES

A. ASTM D1785 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.

B. ASTM D2464 - Standard Specification for Threaded Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.

C. ASTM D443 - AASHTO M43-88, Standard Specification for Sizes of Aggregate.

D. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

E. ASTM D1557 - Standard Test Method for Moisture - Density Relations of Soils and Soil - Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-inch (457-mm) Drop (R 1990).

PART 2 PRODUCTS

2.1 MATERIALS

A. Clean Stone.

1. Clean stone shall be a clean, rounded, free-draining gravel of primarily igneous and/or metamorphic origin washed of all fines and shall have the following gradation:

Sieve Size	% Passing
1"	100%
½"	90-100%
¼"	20-55%
1/16"	0-15%
1/32"	0-5%

B. Bentonite.

1. Bentonite shall be a granular bentonite.

C. Select General Material shall be as specified in Section 02221.

D. Well Piping.

1. Well pipe shall be Schedule 80 PVC, conforming to ASTM D1785 and ASTM D2464, respectively. Joints for the gas extraction system shall be solvent welded. All piping shall be sized as shown on the Plans.

2. Slotted well pipe shall be Schedule 80 PVC factory-slotted screen, slot size equaling 0.040 inch, as shown on the Plans.

PART 3 EXECUTION

3.1 DRILLING

A. CONTRACTOR shall use drilling method capable of advancing the borehole through perched liquids and/or saturated refuse. Borehole shall be plumb and sized in accordance with the Plans.

B. The wells shall be installed to the depths shown on the Plans, or as directed by the ENGINEER. CONTRACTOR shall exercise caution when the depth approaches the Plan depth. Cuttings shall be monitored continuously and drilling shall stop immediately if the base of the landfill or groundwater is encountered. The ENGINEER will approve termination of the borehole based on observing the presence of natural soils or saturated refuse in the teeth of the bucket auger.

C. Boreholes shall be of the size and installed at the locations and elevations shown on the Plans. If the proposed location and/or elevations are not practically obtainable due to field conditions, modifications may be made in accordance with the Contract Documents.

D. All boreholes shall be drilled in the presence of the ENGINEER. The ENGINEER will be available throughout construction to provide construction observation and documentation.

3.2 WASTE DISPOSAL

A. Refuse spoils from trench/boreholes shall be placed and compacted in a designated area on-site in accordance with Paragraph 3.2 in Section 02221 of these Specifications.

3.3 WELL INSTALLATION

A. Slotted PVC gas well pipe shall be installed vertically in the center of the vertical borehole as shown on the Plans, such that the washed stone fills the annular space around the pipe. Slotted and solid PVC pipe and fittings shall be constructed as shown on the Plans. CONTRACTOR shall provide a method to demonstrate to the satisfaction of the ENGINEER that the plumbness and alignment are consistent with the Specifications stated herein.

B. All the PVC pipe joints shall be solvent welded in conformance with ASTM D2855. All joints shall be tight and true.

C. Select Granular Material and bentonite seals shall be placed as shown on the Plans.

3.4 BACKFILLING

A. Backfill borehole to existing contours and elevations with unfrozen materials.

B. Backfilled boreholes must also have the clay cap restored.

3.5 TOLERANCES

A. On the horizontal plane, activities shall be performed to a tolerance of ± 0.5 feet from that shown on the Plans.

B. On the vertical plane, the extraction wells shall be installed to a tolerance of ± 0.1 foot below grade and ± 0.2 foot above grade from that shown on the Plans, unless approved by ENGINEER. The bentonite seals in the gas extraction wells shall be installed to the following minimum dimensions:

1. Top Bentonite Seal: Not less than 4.0 feet (48") thick.

C. Tests and analysis of fill material will be performed in accordance with ASTM D1557.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to ENGINEER or OWNER.

3.6 FALSE STARTS

A. ENGINEER will determine what is to be considered a false start.

B. A borehole for a gas extraction well which is started and cannot be completed will be considered as a false start (no piping installed).

C. All false start holes shall be backfilled with the material excavated from the hole.

D. The clay layer shall be replaced and compacted as required.

E. The top of the hole shall be backfilled with 2 feet (minimum) of soil and compacted as specified in Part 3.4, Backfilling, in this Section, and covered with 6 inches of topsoil.

3.7 TIMING

A. The gas extraction wells shall be installed prior to the placement of gas header piping.

END OF SECTION

SECTION 15677

LEACHATE EXTRACTION UNITS AND SYSTEM INSPECTIONS OR MODIFICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Leachate Extraction Pump Supply and Installation.

B. Modification of Existing Gas Extraction Wells.

C. Abandonment of Existing Passive Gas Venting System.

D. Repair of Groundwater Monitoring Well MW-4.

E. Modification of Existing Leachate Extraction Well LEW-1.

F. Inspection, Resetting and Rebedding of Existing Laterals.

G. Vacuum Monitoring Points Installation.

1.2 RELATED SECTIONS

A. Section 15675 - Gas Extraction Wells.

B. Section 15680 - Gas Extraction System.

B. Section 16010 - General Electrical Requirements.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Leachate Extraction Units.

1. Basis of Measurement: The Leachate Extraction Unit supplied, completed and accepted, will be paid as units for each extraction well.

2. Basis of Payment: Includes all materials, including extraction well pumps, flexible tubing, level sensors, pitless adapters, and related appurtenances in new or existing extraction wells; and for furnishing all labor, tools, equipment, and incidentals

necessary to complete the Work in accordance with the Contract.

B. Modification of Existing Gas Extraction Wells.

1. Basis of Measurement: Modification of Existing Gas Extraction Wells, completed and accepted, will be paid as units for modifying the existing gas extraction wells.

2. Basis of Payment: Includes all materials, installation of leachate pump previously purchased, flexible tubing, level sensors, and related appurtenances in existing extraction well; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the Work in accordance with the Contract.

C. Abandonment of Existing Passive Gas Venting System.

1. Basis of Measurement: Lump Sum.

2. Basis of Payment: Includes all labor, equipment and materials as necessary to excavate around the existing passive vent riser pipes, cut off and cap the vent riser pipe below landfill cover, and replace the excavated soils.

D. Repair of Groundwater Monitoring Well MW-4

1. Basis of Measurement: Lump Sum.

2. Basis of Payment: Includes all labor, equipment and materials as necessary to excavate around the existing riser pipe, cut off the riser pipe, install a coupling, and reconnect the riser pipe.

E. Modification of Existing Leachate Extraction Well, LEW-1

1. Basis of Measurement: Lump Sum.

2. Basis of Payment: Includes equipment and materials as necessary to install a Blackhawk piston pump, flexible tubing, level sensors, and related appurtenances

in existing leachate extraction well; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the Work in accordance with the Contract.

F. Inspection, Resetting and Rebedding of Existing Laterals

1. Basis of Measurement: Linear foot.

2. Basis of Payment: Includes all labor, equipment, materials and all incidentals to excavate a trench to the surface of the existing laterals in areas shown on the plan sheets; inspect for settlement areas; survey at locations specified and determine slope of line; resetting and rebedding of the line including placement of Select Granular Material as necessary in accordance with the Contract.

G. Vacuum Monitoring Points on Existing Lateral Piping.

1. Basis of Measurement: The vacuum monitoring point, supplied, completed and accepted, will be paid as units.

2. Basis of Payment: Includes all materials, including HDPE pipe, protective covering and related appurtenances; and for furnishing all labor, tools, equipment, and incidentals necessary to complete the Work in accordance with the Contract.

1.4 REFERENCES

A. ASTM D1785 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.

B. ASTM D2464 - Standard Specification for Threaded Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.

C. ASTM D443 - AASHTO M43-88, Standard Specification for Sizes of Aggregate.

D. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly Vinyl Chloride (PVC) Pipe and Fittings.

1.5 WARRANTY

A. All materials supplied under this Section shall be warranted for a period of one year by the CONTRACTOR and material manufacturers. The manufacturer's warranty period shall run concurrently with the CONTRACTOR's warranty period. The warranty period shall commence on completion of the well installation.

B. The materials shall be warranted to be free from defects in workmanship and design. Any materials that fail during the warranty period shall be replaced and the unit(s) restored to service at no expense to the OWNER.

1.6 EQUIPMENT DATA

A. CONTRACTOR shall provide equipment data for the pumps, and associated equipment, including manufacturer's data, instructions, and maintenance requirements.

B. Include general assembly drawings showing pump arrangement, components and materials, certified pump curves with pump and system operation point plotted, NPSH curve, wiring diagrams and connection details, motor specifications, and installation instructions.

C. Information pertaining to existing electrical controls is included in Attachment 1, which follows Section 16010 of these Specifications.

PART 2 PRODUCTS

2.1 LEACHATE EXTRACTION UNITS AND MODIFICATION OF EXISTING GAS AND LEACHATE EXTRACTION WELLS - MATERIALS AND EQUIPMENT

A. Leachate Extraction Pumps.

1. Furnish one electric positive displacement piston pump for each of two new gas extraction wells and one existing leachate extraction well.

2. The pump type shall be Blackhawk Anchor Pump Model #101E or approved equal.

3. The pumps shall have a capacity of 0.05-2.0 US gpm when operating against a total dynamic head of 0 to 135 feet of water.

4. There shall be a continuous fiberglass sucker rod assembly to drive the pump.

5. The pump cylinder, piston, rod connectors, and screen shall be stainless steel.

6. The pump motor shall be 1/3 horsepower, rated for 230 volts, 3 phase, 60 hertz., Grainger Model 3N857, or approved equal. The motor shall be designed, manufactured and tested in conformance with the latest revised edition of NEMA MG 1.

7. The pump motor shall have a stuffing box at the drive shaft.

8. The pumps shall be provided with a stainless steel nameplate securely mounted on each pump, showing pump designation, capacity and electrical operation characteristics.

9. The pump motor shall be enclosed in a PVC shroud enclosure suitable for outdoor installations.

10. Four pumps for the existing gas extraction wells (meeting the requirements of this specification) have been purchased and shall be installed under the item of Modifying Existing Gas Extraction Well.

B. Piping.

1. The Pitless Adapters shall be Maass Model JD or approved equivalent for the 2 new gas extraction wells and 1 existing leachate extraction well.

2. Hardwall Flexible Tubing.

   a. Fittings shall be aluminum quick-release couplings, Camlock or equivalent.

3. Dual Containment Piping.

   a. Any aboveground portion of the leachate delivery system shall have dual containment capabilities.

   b. Piping shall be HDPE or approved equal double-walled pipe with 2" inner diameter.

C. Instrumentation.

1. Cycle Counters, Hour Meters and Alternator for the 1 existing gas extraction well and the 2 new gas extraction wells: Install Coyote Model 230V counters, Cramer Elapsed Time Indicator Type 635/636 hour meters, Time Clock Paragon EC 7000-120, and Timemark Model 471 Multistage Alternator or approved equals. The Electrical specifications require that each pumping cycle

and the hours that each pump is in operation be individually recorded for each well at the control panel.

D. Connection of Leachate Pump Controls to Gas Extraction System Controls

1. Install electrical conduit from leachate pump control box to gas extraction system controls in blower building.

2.2 CAPS FOR THE PASSIVE VENT RISER PIPES

A. PVC caps in sizes compatible with the existing passive vent riser pipes shall be supplied.

2.3 VACUUM MONITORING POINTS

A. Suitable lengths (maximum total 50 feet) of rigid one-inch HDPE piping shall be supplied.

B. Four protective boxes, of steel or iron construction, 5.25 inch diameter and 26 inch length, complete with threaded brass cap shall be supplied.

PART 3 EXECUTION

3.1 LEACHATE EXTRACTION UNITS

A. Install pumps and accessories in accordance with manufacturer's instructions and as shown on the Plans.

B. Electrical connections shall be installed in accordance with NEMA WD1, NEMA WD6, and ANSI/NFPA 70 and under the provision of Section 16010 of these Specifications.

C. Lubricate pumps in accordance with manufacturer's instructions prior to start-up.

D. Prior to acceptance of each installed pump, demonstrate proper operation of the pump at the specified operating point, at which time data shall be taken on the total head, flow and horsepower characteristics of the pump.

E. Float or timer activated control system(s) for the leachate extraction units shall be installed in accordance with the manufacturer's recommendations.

F. Pumps shall be tested and flow rates recorded.

G. Conduit shall be routed in direct line from pump control box to gas extraction system control panel in blower building, approximately 1000 feet distance.

H. Leachate pumps shall shut down if blower or flare operation ceases or if high level is activated in condensate tank.

3.2 MODIFICATION OF EXISTING GAS EXTRACTION WELLS

A. The four designated existing gas extraction wells shall be modified by installing the leachate pumps, timer activated control system, and dual containment piping from the gas extraction well to the header pipe in accordance with manufacturer's instructions and as shown in the Plans.

B. Electrical connections shall be installed in accordance with NEMA WD1, NEMA WD6, and ANSI/NFPA 70 and under the provision of Section 16010 of these Specifications.

C. Lubricate pumps in accordance with manufacturer's instructions prior to start-up.

D. Prior to acceptance of each installed pump, demonstrate proper operation of the pump at the specified operating point, at which time data shall be taken on the total head, flow and horsepower characteristics of the pump.

E. Pumps shall be tested and flow rates recorded.

F. Flow sensors shall be tested for placement and operation.

G. Conduit shall be routed in direct line from pump control box to gas extraction system control panel in blower building, over a distance of approximately 1,000 feet.

H. Leachate pumps shall shut down if blower or flare operation ceases or if high level is activated in condensate tank.

3.3 MODIFICATION OF EXISTING LEACHATE EXTRACTION WELL

A. The existing leachate extraction well shall be modified by installing the leachate piston pump, float activated control system, and below ground piping from the leachate extraction well to the header pipe in accordance with manufacturer's instructions and as shown in the Plans.

B. Electrical connections shall be installed in accordance with NEMA WD1, NEMA WD6, and ANSI/NFPA 70 and under the provision of Section 16010 of these Specifications.

C. Lubricate pumps in accordance with manufacturer's instructions prior to start-up.

D. Prior to acceptance of each installed pump, demonstrate proper operation of the pump at the specified operating point, at which time data shall be taken on the total head, flow and horsepower characteristics of the pump.

E. Float or timer activated control system(s) for the leachate extraction units shall be installed in accordance with the manufacturer's recommendations.

F. Pumps shall be tested and flow rates recorded.

G. Conduit shall be routed in direct line from pump control box to gas extraction system control panel in blower building, over a distance of approximately 1,000 feet.

H. Leachate pumps shall shut down if blower or flare operation ceases or if high level is activated in condensate tank.

3.4 ABANDONING THE EXISTING PASSIVE GAS VENTING SYSTEM

A. CONTRACTOR shall excavate the cover soils adjacent to the each passive gas vent to expose the riser pipe.

B. The riser pipe shall be cut off below the existing cover soils and capped.

C. The existing cover soils shall be replaced and compacted. Restored grades shall be similar to existing grades.

3.5 REPAIR OF GROUNDWATER MONITORING WELL MW-4

A. CONTRACTOR shall excavate around the riser pipe of MW-4 exposing the cracked riser pipe.

B. The existing riser pipe shall be cutoff below the crack.

C. A PVC coupling shall be installed to reconnect the riser pipe.

3.6 INSPECT, SURVEY, RESET AND REBED EXISTING LATERAL PIPING

A. CONTRACTOR shall excavate a four-foot wide trench in the locations specified on plan sheet 9. The existing lateral piping shall be inspected and invert elevations and slopes determined, as shown on the plan sheets and as directed by the ENGINEER.

B. CONTRACTOR shall reset lateral piping where settlement of the pipe has occurred, or as directed by the ENGINEER.

C. CONTRACTOR shall rebed lateral piping with Select Granular Material as required to maintain a slope of 2% - 9%, as directed by the ENGINEER, along the entire length of lateral.

D. CONTRACTOR shall excavate beyond the areas shown on the plan sheets as directed by the ENGINEER.

E. CONTRACTOR shall replace and restore cover soils, according to the Specifications listed in Section 02220.

3.7 INSTALL VACUUM MONITORING POINTS

A. CONTRACTOR shall install four vacuum monitoring boxes in the locations shown on the Plan Sheets.

B. CONTRACTOR shall excavate to existing lateral (three- or four-inch HDPE pipe) and tap a threaded connection to one-inch rigid HDPE pipe.

C. CONTRACTOR shall install appropriate length of one-inch rigid HDPE pipe.

D. CONTRACTOR shall install protective box, 5.25 inch diameter and 26 inch length, over one-inch HDPE pipe, with threaded brass cap.

E. CONTRACTOR shall replace and restore cover soils, according to the Specifications listed in Section 02220.

END OF SECTION

SECTION 15680

GAS EXTRACTION SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wellhead Assemblies.

B. Lateral Piping.

C. Protective Structures Around Wellheads.

1.2 RELATED SECTIONS

A. Section 02221 - Earthwork.

B. Section 15675 - Gas Extraction Wells.

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Wellhead Assemblies.

1. Basis of Measurement: Shall be paid by the Contract unit price for each gas extraction wellhead assembly to be connected to the gas header piping.

2. Basis of Payment: Includes all valves, header valve assemblies fittings, gauges, flexible connections, insulation and/or appurtenances, as shown on the Plans and as described in this Specification.

B. HDPE Gas Lateral Piping

1. Basis of Measurement: Shall be paid by total linear foot length of pipe installed, measured at invert and by diameter in inches.

2. Basis of Payment: Includes excavating, including excavation of waste, furnishing and placement of Select Granular Material to slopes shown on Plans; compacting; lateral pipe, fittings and accessories assembled.

C. Protective Structures Around Wellheads.

1. Basis of Measurement: Shall be paid by the Contract unit price for each protective structure around each gas extraction wellhead assembly to be connected to the gas header piping.

2. Basis of Payment: Includes supply and installation of the protective structures.

1.4 SUBMITTALS

A. Manufacturer's product literature, including but not limited to: dimensions, sizes, seals and connections, pressure rating, and installation instructions. Submittals shall be for, but not limited to: wellhead assemblies, valves, meters, gauges, insulation, and electrical components.

B. Operating and maintenance instructions including, but not limited to: wellhead assemblies, valves, meters, and gauges.

1.5 QUALITY ASSURANCE

A. All pipe fittings shall be new and unused.

B. Each length of pipe shall be clearly marked with the manufacturer's name, the type and class of pipe.

PART 2 PRODUCTS

2.1 MATERIALS

A. Wellhead Assemblies.

1. Manufacturer: Landfill Control Technologies, Accu-Flo R Wellhead Assembly, Landfill Gas & Environmental Products, Inc., PC1000 Precise Control Wellhead, or approved equal.

B. Gas Lateral Piping

1. Three inch diameter HDPE pipe and fittings (SDR 17) Driscopipe 6400 or PolyPipe 3408, or other as approved by ENGINEER shall be installed for the gas lateral pipe.

2. New gas lateral pipe shall be connected to existing gas header pipe at locations shown on the Plans.

3. Joints shall be butt fused in conformance with ASTM D-3261 and pipe manufacturer's recommendations. Connections to HDPE piping can be made by computer controlled electrofusion method and equipment as manufactured by Central Plastics Company or approved equal.

4. All flange connections shall be made with full face neoprene gaskets.

5. The CONTRACTOR shall provide for the services of a manufacturer's installation specialist for butt fusing joints, unless the CONTRACTOR has available personnel who have been trained by the manufacturer to butt fuse joints.

C. Leachate/Gas Extraction Protective Structures (2 required)

1. Shall consist of a metal or wooden structures with a personnel swing door and hardware, wall and roof insulation and accessories. CONTRACTOR shall be responsible for engineering and sizing of a ll components to meet applicable building codes.

2. The structure shall include a ventilation system consisting of two roof vents.

3. The structure shall be designed and constructed to sit on a 6" wide by 6" high wooden containment lip.

4. The roof shall be sloped.

5. Members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with applicable code. Minimum 40 pounds/square foot (psf) live load and 25 psf dead load.

6. The building shall be installed with one swing door, standard width. The door shall be located on the south or east side of the building, whichever provides easy access to valves and measuring ports of wellhead assembly.

D. Gas Extraction Protective Structure (1 only)

1. Shall be a metal enclosure, capable of encasing gas extraction system.

2. A HINGED, lightweight, lockable cover shall be securely attached to the top of the protective structure. The CONTRACTOR shall submit shop drawings of the protective structure and cover for approval by ENGINEER prior to fabrication.

PART 3 EXECUTION

3.1 INSTALLATION

A. Gas extraction wells shall be constructed prior to the installation of the gas conveyance piping. If the record locations of the wells are different than proposed, the conveyance piping location shall be modified accordingly, as approved by ENGINEER.

B. Connect the gas extraction wellhead assemblies to the gas header piping as shown on the Plans.

C. Protect gas extraction wells (to be installed before the header pipe).

D. All pipe, valves and accessories are to be supplied by CONTRACTOR.

E. The pipe manufacturer shall be one whose pipe and fittings have been accepted for use in Wisconsin by the Municipal Waste Water Section of the WDNR. All pipe and fittings used shall be supplied by the same manufacturer and shall be of the same type.

F. Pipe joints shall be butt fused or flanged and shall be made as recommended by the manufacturer.

G. Pipes shall be laid with the deflection at joints not exceeding the pipe manufacturer recommendations.

H. All pipes shall be laid on a bedding of compacted Select Granular Material to the lines and grades as detailed on the Plans, followed by backfill around and over the pipe with Select Granular Material of approved quality.

I. All pipes and fittings shall be inspected, prior to laying, for defects, and any damaged or unsound pipe or fitting shall be replaced. CONTRACTOR shall be responsible for removal from the Site any damaged and unsound pipe lengths. OWNER shall be credited with the cost of any pipe damaged by CONTRACTOR.

J. New gas lateral pipes shall be connected to existing gas header pipe at locations shown on the Plans. CONTRACTOR shall furnished appropriate tee and/or wye fittings for the connections. CONTRACTOR shall confirm elevations of connections and slope of new gas laterals, as indicated in Construction Tolerances.

K. All field cuts of pipe shall be made with an approved mechanical pipe cutter or with a power saw in order to make a straight, true cut without chipping and cracking the pipe.

L. CONTRACTOR shall obtain the ENGINEER's approval of the compaction of the pipe bedding prior to laying of pipe sections. Each section of pipe shall have a uniform bearing throughout its lengths and shall be true to the line and grade required.

M. At all cessations of pipe laying, the end of the latest laid pipe shall be securely closed with a tightly fitting iron or wooden plug of approved quality, so that mud, silt, gravel or other foreign material may not enter the pipe. The plug shall be removed when the crew is ready to install further pipe lengths.

N. Wellhead assembly shall be installed in accordance with manufacturer's recommendations.

O. The area between the conveyance pipe and the extraction wells shall be carefully excavated to preclude damage to the conveyance pipe, the extraction well, and to the 2-foot thick bentonite seal around the extraction well.

P. All areas disturbed during wellhead and protective structure installation shall be backfilled with granular bentonite. The top one foot (outside of the protective structure) shall be covered by existing cover soils and topsoil.

3.2 CONSTRUCTION TOLERANCES

A. On the horizontal plane, the gas extraction system features shall be installed to a tolerance of ± 0.5 foot from that shown on the Plans.

B. On the vertical plane, the gas header and condensate collection pipes shall be installed to a vertical tolerance of ± 0.1 foot from that shown on the Plans. Pipe slopes shall not be less than that shown on the Plans.

B. CONTRACTOR shall test the system as follows and prepare a report for submittal to ENGINEER.

3.3 TESTING

A. All gas header and condensate force main pipes, fittings, valves and appurtenances, shall be pressure tested. With all valves closed and the connecting pipes to the existing header system mechanically plugged, the pipes shall be air pressurized to 3.5 pounds/square inch, gauge pressure (psig). The valve on the pressurizing unit shall be closed and the system pressure monitored. A system pressure of 3.0 psig or greater maintained for thirty minutes after the valve closing shall be considered acceptable. The pressure test shall include an equation which accounts for temperature change over time when calculating the pressure drop over time, or the CONTRACTOR shall document that temperature is essentially constant over time.

B. Leakage and pressure tests shall be performed in the presence of ENGINEER. CONTRACTOR shall give 48 hours notice to ENGINEER prior to testing. A written report shall be prepared by CONTRACTOR for each test. CONTRACTOR shall provide all gauges, pumps, pipe, connections, and all other necessary apparatus to conduct tests. If results of tests performed do not conform to requirements as stated herein, CONTRACTOR shall make the necessary repairs and repeat tests as required until satisfactory results are obtained.

END OF SECTION

SECTION 16010

GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Work.

B. Regulatory Requirements.

C. Coordination.

D. Warranty.

E. General Material Information.

F. Component Installations.

G. Trial Usage of Electrical Systems.

H. Tests.

I. Cleaning.

1.2 DESCRIPTION OF WORK

A. The Work covered by this Division of the Specifications includes the furnishing of all labor, materials, tools, equipment, permits, certificates and temporary protection necessary for or incidental to executing and completing the electrical Work related to the landfill gas migration control system. All Work shall be as specified herein.

B. Prior to submitting his Bid, Bidder shall call to the attention of the ENGINEER any material or apparatus he believes to be inadequate or to any necessary items or Work omitted. CONTRACTOR shall address any questions regarding the interpretation of the Contract Documents before the Bid opening. The ENGINEER reserves the right to interpret his own Specifications and Contract Plans after Bids are received, and to demand that the installation conform to his intent. Failure of the CONTRACTOR to acquaint himself with existing conditions at the Site shall in no way relieve the CONTRACTOR of the responsibility for making installation

in conformance with the Contract Documents without additional cost to the ENGINEER or OWNER.

1.3 RELATED SECTIONS

A. Section 02221 - Earthwork.

B. Section 15677 - Leachate Extraction Units and Modification of Existing Extraction Wells.

C. Section 15680 - Gas Extraction System.

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Basis of Measurement: Lump sum price.

B. Basis of Payment: Payment shall include supplying and installing electrical hookup to the control panel associated with the blower, and leachate pumps in the gas extraction wells and all electrical components, including wiring, electric conduits, switches, etc., whether specified or not to make the complete assembly functional and for all materials, tools, equipment, labor, permits, certificates, temporary protection, and incidentals necessary to execute and complete the Work as specified.

1.5 REFERENCES

A. Information pertaining to the existing electrical control system is included as Attachment 1 to these Specifications.

1.6 SUBMITTALS

A. Prior to installing the electrical Work, CONTRACTOR shall submit to the ENGINEER electrical drawings and a complete list of the materials which the VENDOR intends to furnish indicating type and manufacturer and proposed control logic narrative.

B. The electrical drawings shall show the layout of the electrical Work and the routing of the electrical supply to the Site. Additional information, wiring diagrams, marked catalog cuts, and data may be requested by the ENGINEER in order to qualify a product for approval.

1.7 REGULATORY REQUIREMENTS

A. All Work and materials shall conform in every respect to the current rules and requirements of the National Fire Protection Association, National and State Electrical Codes, Local Codes and Ordinances, Local Utility Regulations, and OSHA.

B. CONTRACTOR shall give the proper authorities all required notices relating to the project, obtain all official permits and licenses required, pay all fees incidental thereto, and deliver upon completion of the Work, without cost to the ENGINEER or OWNER, all required certificates of inspection and approval.

C. Wherever the requirements of the Contract Documents exceed those of these codes, the requirements of the Contract Documents shall govern. Code compliance is mandatory. Nothing in these Contract Documents shall be construed as permitting Work not in accordance with these laws and codes.

1.8 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR shall be responsible for the proper care and storage of material and equipment on Site. Any material damaged by rust corrosion, warping, breakage, finish damage, etc., shall be replaced by the CONTRACTOR to the satisfaction of the ENGINEER.

1.9 COORDINATION

A. CONTRACTOR shall be responsible for coordinating the Work required under all Sections of these Specifications that affect the Work covered in this Section. This effort is required to assure that the project construction proceeds in an appropriate and timely manner. Any deviation from Contract Documents shall be approved by the ENGINEER before proceeding. All changes to the project Work due to lack of this coordination shall be provided by the CONTRACTOR at no cost to the ENGINEER or OWNER. All costs incurred by the ENGINEER or OWNER to resolve lack of coordination problems shall be reimbursed by the CONTRACTOR.

1.10 WARRANTY

A. CONTRACTOR acknowledges his acquaintance with the Drawings and Specifications and its respective requirements. He shall guarantee that the electrical system has been installed strictly in accordance with the electrical Specifications using only the best of materials available, installed in a substantial manner by experienced labor.

B. CONTRACTOR shall place various components of the electrical system in service prior to completion date as instructed by ENGINEER, but this shall not change the guarantee period which shall be one year after acceptance by OWNER.

C. CONTRACTOR agrees to replace and/or repair any items failing from causes of faulty workmanship, material or design without cost to ENGINEER or OWNER, at any time within one year from date of final acceptance.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use of quality materials is of essence on this project.

B. Where two or more units of the same class of materials or equipments are required, provide products of a single manufacturer. Components parts of materials or equipments need not be products of the same manufacturer.

C. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment.

D. Provide materials and equipment with manufacturer's standard finish system. Provide manufacturer's standard finish color, except where specific color is indicated. If manufacturer has no standard color, finish equipment with ANSI No. 61, light gray color.

E. Equipment and devices to be installed outdoors or in unheated enclosures shall be capable of continuous operation within an ambient temperature range of -40°F to 100°F.

F. Provide materials and equipment acceptable to the regulatory authority having jurisdiction for the class, division, and group of hazard area indicated.

G. Where materials, equipment apparatus, or other products are specified by manufacture, brand name, and type of catalog number, such designation is to establish standard of desired quality and style and shall be the basis of the Bid.

H. All materials used for the electrical installation shall be new and unused, and shall be uniform in type and manufacture for the entire electrical installation.

I. All materials shall be suitable for the conditions and duties imposed upon them in service and shall be the latest standard catalog products of reputable manufacturers.

J. It is the intent of these Specifications that the CONTRACTOR shall provide all the necessary material, apparatus, and devices to complete the installation as specified herein, except such parts as are specifically excepted. If an item is either shown on the Drawings or called for in these Specifications, it shall be considered sufficient of said item in this Contract.

K. All sizes as given are minimum. Material and labor shall be first class and workmanlike and to the satisfaction of the ENGINEER and shall be subject to his inspection test and approval at all times from commencement until acceptance of completed Work.

L. Manufacturers shall be responsible for providing material listed by U.L. or other approved agencies, and all governing codes and ordinances. All material must bear U.L. and/or other approved labels where possible. Items specified by catalog number or brand name and approval of Shop Drawings will not relieve the manufacturer of this responsibility.

M. Control wiring shall have permanent sleeve type markers applied to all wires. Minimum wire size shall be 14 AWG stranded copper.

N. The wire color identification shall be:

1. neutral wire white;
2. live wires black, red, blue on 120/208 volt system;
3. ground wire green; and
4. single conductor control wiring yellow.

O. Control panel shall be in accordance with NEMA 4 requirements, and shall be designed and installed to provide the system logic requirements in this specification.

P. All interior sensors, wiring and mechanical devices shall be either explosion proof or intrinsically safe.

2.1 CONDUITS

A. Conduits required for this Work are indicated on the Drawings and include, but are not necessarily limited to:

1. elbows;

2. rigid conduit; and
3. couplings and fittings.

B. All conduit shall be rigid galvanized steel and sized as shown on the Drawings. Sizes not shown shall be sized as indicated in Table 1 or 3, Chapter 9, of the NEC for THW or equivalent wire insulation. Unless otherwise specified, ¾-inch shall be the minimum size used.

C. Set screw indenter fittings are not acceptable.

D. Rigid conduit couplings and terminals shall be threaded. Set screw, split, or gland type couplings are not acceptable for rigid conduit.

E. All exposed rigid conduit including elbows, bends, and couplings shall be in strict accordance with ANSI Specifications. Each length of conduit and all parts of the conduit system, regardless of type, shall bear a label indicating compliance with the requirements of the U.L., Inc., or other approved listing agency.

F. Factory-made bends or elbows shall be used whenever possible. Field bends shall be carefully made so as to prevent conduit damage or reduction in the internal area. The inner radius shall be not less than six times the nominal diameter of the conduit with carefully matching bends on parallel runs so as to present a neat appearance. The number of crossovers shall be kept to a minimum. The total bends in power conduit between boxes shall not exceed two quarter bends or 180 degrees between pull boxes.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install Work in locations shown on the Contract Plans, unless prevented by Site conditions.

B. Install the appropriate electrical controls to provide timer activated sequencing for the two new leachate extraction units.

C. When available, existing electric services shall be made available for temporary construction electrical power. All connections to an existing service shall be completed by the CONTRACTOR in accordance with all code requirements, and such connections shall not limit or interfere with the operation of the existing plant facilities.

D. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide Work which has a neat and finished appearance.

E. Coordinate electrical Work with the ENGINEER and Work of other trades to avoid conflicts, error, delays, and unnecessary interference with operation of the Site during construction.

F. Check the approximate locations of light fixtures, electrical outlets, equipment, and other electrical system components shown on the Drawings for conflicts with opening, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, consult the ENGINEER. The ENGINEER's decision shall govern. Make modifications and changes required.

G. Follow manufacturer's installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between manufacturer's instruction, codes and regulations, and these Contract Documents, follow ENGINEER's decision. Keep copy of manufacturer's installation instructions on the job Site available for review at all times.

H. Lay out Work carefully in advance. Do not cut or notch any structural member or building surface without specific approval of ENGINEER. Carefully carry out any cutting, channeling, chasing, or drilling of floor, wall, partitions, ceilings, paving, or other surfaces required for the installation support, or anchorage of conduit, raceways, other electrical materials and equipment. Following such Work, restore surfaces neatly to original conditions.

3.2 INSTALLATION - CONDUIT

A. Exposed conduit shall be run parallel to or at right angles from walls or beams and plumb on the walls. Conduit may be run through concrete beams in steel pipe sleeves where approved by the ENGINEER. As far as practical, conduit shall be pitched slightly to drain to the outlet boxes or otherwise installed to avoid trapping of condensate.

B. All conduit that is cut on the job shall be reamed to remove burrs before installation. All conduit connections shall be made up watertight. Conduit terminating in control units and elsewhere shall be fitted with insulating bushings.

C. Conduit shall be neatly grouped where several lines follow a parallel course, shall be well supported using galvanized clips or hangers of the ring or trapeze type, and shall be held by Phillips Red Head, or RAWL, self-drilling anchors or approved equal. Perforated strap hangers will not be accepted.

D. Install raceways above piping and ductwork wherever possible, maintaining at least 6 inches from flues, steam lines, or hot water pipes.

E. Install raceways parallel to slab supports (beams, columns, and structural walls) a minimum of 12 inches from such supports.

F. Install to provide drainage where exposed to condensation. Avoid trapped runs.

G. Flexible metallic raceway connecting motors and their adjacent junction boxes, shall be of sufficient length to permit adjustment and removal of the motor without removal of the junction box.

H. Provide Schedule 40 pipe sleeves for raceways passing through floors or roofs. Counterflash sleeves for raceways passing through roofs. Pack voids between raceways and sleeves with approved materials where conduits pass through exterior walls, floor slabs on grade, or those required in fire wall separations.

I. All conduit threads shall be painted with a suitable conductive lubricant before assembly.

J. The ENGINEER reserves the right to make reasonable changes in the location of outlets, apparatus, or equipment up to the time of roughing-in. Such changes, as directed by the ENGINEER, shall be made by the CONTRACTOR without additional compensation.

K. All conduit entrances to rigid facilities shall be accomplished using a rigid steel conduit section through the concrete and extending at least 5 feet from the exterior wall.

3.3 PROTECTION DURING CONSTRUCTION

A. Throughout this Contract, provide protection for materials and equipment against loss or damage in accordance with provisions elsewhere in these Contract Documents. Protect everything from the effects of weather. Prior to installation store items on clean, dry, indoor locations. Store in clean, dry, indoor heated location items subject to corrosion under damp conditions, and items containing electrical insulation, such transformers, conductors, motors, and controls. Energize all space heaters furnished with equipment.

B. Following installation, protect materials and equipment from corrosion, physical damage, and effects of moisture on insulation. Cap conduit runs during construction with manufactured seals. Keep openings in boxes or equipment closed during construction. Energize all space heaters furnished with equipment.

3.4 TRIAL USAGE OF ELECTRICAL SYSTEMS

A. ENGINEER has the privilege of the trial usage of electrical systems or parts thereof for the purpose of testing under load the new installation and learning the operational procedures.

B. The trial usage shall be continued for a length of time as deemed reasonable by the ENGINEER and all related costs shall be included in the Contract, with the exception of the electrical power cost which will be paid by the OWNER.

C. The operations shall be carried out only with the express knowledge and under supervision of the responsible sub-trade who shall not waive any responsibility because of trial usage.

D. While trial usage will be kept to a minimum, it shall not be construed as acceptance by the ENGINEER.

3.5 TESTS

A. After the electrical system installation is completed and at such time as the OWNER may indicate, conduct an operating test for approval. Demonstrate that the equipment operates in accordance with the requirements of these Contract Documents. Perform the test in the presence of the ENGINEER or his authorized representative. Furnish all instruments and personnel required for the test. The OWNER will furnish the necessary electrical power. On completion of Work the installation shall test entirely free of grounds and short circuits.

B. A standard megger insulation test shall be made. System shall meet minimum requirements as set by equipment manufacturer or as set forth in electrical codes.

C. CONTRACTOR shall demonstrate balancing of the load among the feeder conductors or about the phase wires at each distribution cabinet and at substation or main panel.

D. CONTRACTOR shall demonstrate proper performance of signal systems.

E. Check the line current in each phase for each piece of equipment. If any phase current in any piece of equipment is above their rated nameplate current, determine and submit in writing to the OWNER the cause of the problem.

3.6 CLEANING

A. CONTRACTOR shall at his own expense remove all debris, tools, etc., resulting from or left from his work. He shall repair to satisfaction of OWNER any damage to the building or any equipment resulting from his work.

B. Keep premises free from accumulation of waste materials or rubbish. Upon completion of Work, remove materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch up scratches scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish.

C. Repair affected surfaces to conform to the type, quality, and finish of the surrounding surface in a neat and workmanlike manner.

END OF SECTION

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

JUNKER LANDFILL TRUST,
a Minnesota business trust,

Plaintiff,

and

STATE OF WISCONSIN, Case No. 96-C-019-S

Intervening Plaintiff,

v.

JUNKER RECYCLING, INC., a Minnesota corporation, f/k/a JUNKER SANITARY LANDFILL, INC., JUNKER SANITATION SERVICES, INC., a Minnesota corporation, JAMES L. JUNKER, UNITED WASTE SYSTEMS, INC., a Delaware corporation, UNITED WASTE TRANSFER, INC., a Minnesota corporation, and John Does and Mary Does numbered 1 through 800,

Defendants,

v.

GARRY THOMPSON, JOHN SAUERS, SANITARY LANDFILL SITE, INC. and ANDERSEN CORPORATION,

Third-Party Defendants.

CONSENT DECREE

TABLE OF CONTENTS

I. BACKGROUND

A. The State of Wisconsin ("the State"), by its attorneys, James E. Doyle, Attorney General, and Shari Eggleson and Frank Remington, Assistant Attorneys General, at the request of the Wisconsin Department of Natural Resources ("the WDNR"), filed a complaint in intervention in this action pursuant to Section 107 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, ("CERCLA"), 42 U.S.C. §9607, and sec. 144.76(3), Wis. Stats.

B. The State seeks in its complaint, inter alia.: (1) reimbursement of costs it has incurred for response actions at the Junker Landfill in the Town of Hudson in St. Croix County, Wisconsin ("the Landfill"), and (2) the performance of additional response actions by the plaintiff and or the defendants at the Landfill consistent with the National Contingency Plan, 40 C.F.R. Part 300 (as amended), ("the NCP").

C. Prior to the filing of this action, the WDNR had, in response to releases of hazardous substances at and from the Landfill, installed a cap, an active gas extraction system and a leachate collection system at the Landfill and operated and maintained those systems from September of 1992 until March of 1995, at which time the Junker Landfill Trust took over operation and maintenance work at the Landfill under a contract with the WDNR.

D. The Junker Landfill Trust (a/k/a The Andersen Group) prepared and submitted to the WDNR a Remedial Investigation Report ("RI"), which was approved by WDNR on August 10, 1995, and a Feasibility Study Report ("FS") for the Landfill which was approved by WDNR on March 27, 1996.

E. Pursuant to Section 117 of CERCLA, the WDNR will publish notice of the completion of the FS and of the proposed plan for final remedial action at the Landfill, and will provide an opportunity for comments from the public on the proposed plan.

F. The decision of the WDNR on the final remedial action to be implemented at the Landfill will be included in a Record of Decision ("ROD") to be issued by WDNR, which is incorporated herein by reference.

G. Based on the information currently available to it, the State believes that the remedial work at the Landfill will be properly and promptly conducted by the Settling Defendants if conducted in accordance with the requirements of this Consent Decree and its appendices.

H. The Settling Parties believe, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Settling Parties in good faith and implementation of this Consent Decree will expedite the cleanup of the Landfill and will avoid prolonged and complicated litigation between the Settling Defendants and the State, and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, it is hereby ordered, adjudged and decreed:

II. JURISDICTION

This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. ss. 1331 and 1345, and 42 U.S.C. ss. 9607 and 9613(b). This Court also has personal jurisdiction over the Settling Defendants. Solely for the purposes of this Consent Decree, the Settling Defendants waive all objections and defenses that they may have to the jurisdiction of this Court or to venue in this District. The Settling Defendants may not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

III. PARTIES BOUND

A. This Consent Decree is binding upon the State and upon the Settling Defendants and their agents, successors and assigns. The undersigned representative of each Settling Party certifies that he or she is fully authorized by the party whom he or she represents to enter into and execute this Consent Decree and legally bind such party to the terms of this Consent Decree.

B. The Settling Defendants shall condition all contracts entered into by them for the performance of the Work required by this Consent Decree on compliance with the terms of this Consent Decree, and compliance with all applicable laws and administrative rules. The Settling Defendants shall provide a copy of this Consent Decree to any contractor(s) and/or consultant(s) hired to perform the Work required by this Consent Decree.

IV. STATEMENT OF PURPOSE

In consideration of each of the promises, covenants and undertakings of the WDNR and the Settling Defendants ("the Settling Parties") under this Consent Decree, the Settling Parties hereby agree that the Settling Defendants shall:

A. Prepare plans and specifications for construction of the

remedy that is selected and approved by the WDNR (remedial design or RD);

B. Implement the remedy (remedial action or RA) approved by the WDNR, including any additional remedial actions deemed necessary following the completion of implementation of the RA, as provided in the ROD; and

C. Reimburse the WDNR for oversight costs and other response costs incurred by the WDNR after the Record of Decision (ROD) for this Site is issued.

V. SITE DESCRIPTION

Site Names:
Junker Sanitary Landfill, Inc., a/k/a:
Pilquist Bros. Sanitary Landfill
Landfill Land Company Landfill
Sanitary Landfill Site, Inc.
Klondike Resource Conservation and Recovery System/Program Landfill

Site Location and Size:
SE1/4, SE1/4, and SW1/4, SE1/4, Section 13, T29N, R19W
Town of Hudson, St. Croix County, Wisconsin
Fill area of 15 acres which contains approximately 1.25 million cubic yards of waste
Total property area is 41.1 acres.

Site Geology/Hydrogeology:
The Site lies in a former gravel pit. The geology at the Site consists of 40 to 100 feet of unconsolidated material of glacial origin - medium to coarse-grained sand with gravel. The underlying bedrock is the Prairie du Chien formation which is up to 300 feet thick. This formation is a fractured dolomite with eroded channels and there are several bedrock faults in the region with vertical offsets of up to 400 feet. Underlying the Prairie du Chien is the Jordan sandstone formation.

The Prairie du Chien and the underlying Jordan sandstone together comprise the regional aquifer with flow generally westward toward the St. Croix River, a major discharge boundary. The depth of the water table ranges from 100 feet near the Junker Sanitary Landfill Site to 60 feet at CTH A (two and one half miles downgradient/west). The water table is generally within the Prairie du Chien. However near CTH A and in the vicinity of LaBarge Road, the water table is located within the overlying unconsolidated sand and gravel as indicated on well logs for private drinking water wells located in these areas. This is probably a result of bedrock faulting and erosional features in the surface of the Prairie du Chien which were later filled in with glacial material. There is also a documented bedrock fault west of

CTH A. At this point the water table shows up in the unconsolidated deposits above the Prairie du Chien bedrock.

Site History:
Landfill operations began at the Site in November 1972 under the ownership of Walfred Pilquist. In April, 1973, Garry Thompson purchased the landfill and continued operation as the new owner. The landfill was expanded by Mr. Thompson and licensed by the WDNR in October 1975, under the name of Landfill Land Company, which was owned by Garry Thompson and operated by him until 1977. In 1977, Garry Thompson established a corporation, Sanitary Landfill Site, Inc., which leased the landfill to James Junker of Junker Sanitary Landfill Inc. who operated it until January 5, 1987. In 1987, Garry Thompson reopened the Site illegally under the name Klondike Resource Conservation and Recovery System/Program Landfill and operated it for a period of time. The Site received municipal solid waste, demolition waste and commercial/industrial waste.

Site Characteristics:
Currently the Site has an NR 504 cap, an active gas extraction system and a leachate extraction system. There are also a series of gas monitoring probes, groundwater monitoring wells and various monitoring points associated with the gas and leachate extraction systems.

The cap consists of two feet of clay, one and one-half feet of grading material and six inches of topsoil. The permeability of the clay barrier layer was documented during construction to be less than $1x10^{-6}$ cm/sec. The landfill Site is well vegetated and surface water runoff from the cover system is directed to one of two detention ponds adjacent to the landfill.

The active gas extraction system consists of seventeen gas extraction wells which are operated to control methane gas migration away from the landfill site while minimizing oxygen intrusion into the landfill. The gas extracted from the landfill flows through a header system and is thermally destructed by a ground flare.

The leachate extraction system consists of four permanent pumps which were installed in four gas extraction wells in December 1993. These four leachate extraction pumps have historically pumped at a rate of 5 gallons per minute (gpm) for approximately 1.25 hours a week. The leachate flows through the gas header system to an on-site 4,000 gallon holding tank. Condensate from the active gas extraction system is also stored in this tank.

Known Substances of Concern:

Trichloroethylene	(TCE)
Tetrachloroethylene	(PCE)

1,1,1 Trichloroethane (111TCA)
1,1 Dichloroethane (11DCA)
1,1 Dichloroethlyene (11DCE)

VI. DEFINITIONS

Unless otherwise expressly provided herein, terms used in this Consent Decree which are defined in CERCLA or in regulations promulgated under CERCLA, including but not limited to the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 ("the NCP"), shall have the meaning assigned to them in CERCLA or the NCP. Whenever the terms listed below are used in this Consent Decree, including its attachments, the following definitions, including for purposes of 42 U.S.C. § 9613 (f)(1) and (2), shall apply:

A. "Andersen Group" shall mean the Junker Landfill Trust, a Minnesota business trust operating pursuant to Chapter 318, Minnesota Statutes (1994), and its settlors, including the Andersen Corporation and the other PRPs identified in Attachment D hereto.

B. "Consent Decree" shall mean this Consent Decree and all of its attachments and exhibits. In the event of conflict between the text of this Consent Decree and any of its attachments, the text of this Consent Decree shall govern.

C. "Feasibility Study or FS" shall mean the Feasibility Study submitted to WDNR by Wenck Associates on behalf of the Andersen Group, and approved by WDNR on March 27, 1996.

D. "Junker Sanitary Landfill Site," "the Site" or "the Landfill" shall mean the contiguous property as shown on Attachment A, located in the southeast quarter of the southeast quarter, and the southwest quarter of the southeast quarter, of Section 13, T29N, R19W in the Town of Hudson, St. Croix County, Wisconsin, estimated to be 41.1 acres, including an area of approximately 15 acres where waste was landfilled, known as the former Junker Sanitary Landfill, Inc.

E. "Landfill Remediation Trust" shall mean those Settling Defendants, exclusive of the members of the "Andersen Group", who have joined together for the purposes set forth in the Landfill Remediation Trust Agreement.

F. "Parties" shall mean the parties to this litigation.

G. "Potentially responsible parties" or "PRPs" shall mean all parties who sent wastes to the Site, who operated the Site, who owned the Site, who transported wastes to the Site, or who are otherwise liable under 42 U.S.C.A. §9607(a).

H. "Record of Decision" or "ROD" shall mean the WDNR Record of Decision for the remedial action to be implemented at the Site, including any changes or amendments thereto.

I. "Settling Defendants" shall mean James L. Junker, Junker Recycling, Inc., Junker Sanitary Landfill, Inc., Junker Sanitation Services, Inc., United Waste Systems, Inc. and United Waste Transfer, Inc. and present and future Settlors of the Landfill Remediation Trust, their successors, assigns and heirs.

J. "Settling Parties" shall mean the Settling Defendants and the State of Wisconsin.

K. "Special Well Construction Zone" shall mean that area within the Town of Hudson, St. Croix County, Wisconsin where special well construction requirements have been or are in the future imposed by the WDNR because of the presence of contaminants in the groundwater. The area currently subject to special well construction requirements, which was most recently revised by WDNR on July 24, 1992, is shown on Attachment B.

L. "State" shall mean the State of Wisconsin, including all departments and agencies and all officers and employees thereof.

M. "Wisconsin Department of Natural Resources" or "WDNR" shall mean the agency of the State of Wisconsin created pursuant to s. 15.34, Wisconsin Statutes, and charged with implementing the provisions of ch. 144, Wisconsin Statutes, and authorized in conjunction with the Wisconsin Department of Justice to enter into settlements in the name of the State of Wisconsin pursuant to 42 U.S.C.A. § 9613 (f)(2), and any successor department or agency thereof.

N. "Work" shall mean all activities that the Settling Defendants are required to perform under this Consent Decree, other than record preservation which is required under Section XXIII.

VII. GENERAL PROVISIONS

A. The objective of the Settling Parties in entering into this Consent Decree is to protect public health, safety and welfare and the environment at the Site by the design and implementation by the Settling Defendants of the remedy selected in the ROD.

B. In consideration of each of the promises, covenants and undertakings of the State set forth herein, the Settling Defendants hereby agree to finance and perform the Work (or have it performed) that is required by this Consent Decree, in

accordance with the requirements in the Scope of Work ("SOW") which is attached to this Consent Decree as Attachment C and all plans, performance standards, specifications and schedules set forth in, or developed and approved by WDNR pursuant to, the SOW. Said SOW is for the completion of remedial design/remedial actions for the Site and is deemed incorporated into and made an enforceable part of this Decree.

VIII. PERFORMANCE OF THE WORK

A. All of the Work to be performed by the Settling Defendants pursuant to this Consent Decree shall be under the direction and supervision of a qualified and registered professional engineer and a qualified hydrogeologist, as defined in s. NR 500.03(64), Wis. Adm. Code. Within 14 calendar days after the effective date of this Consent Decree, the Settling Defendants shall notify the WDNR, in writing, of the name, title, and qualifications of the proposed consultant(s), engineer(s) and hydrogeologist(s) (hereinafter the Consultant(s)), including the names, titles and responsibilities of the supervisory personnel for the Work.

B. The Work conducted pursuant to this Consent Decree is subject to approval by the WDNR. The Work shall be conducted in accordance with sound scientific, engineering and construction practices and shall be consistent with, and performed in accordance with NCP; CERCLA, as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA); EPA Superfund Remedial Design (RD) and Remedial Action (RA) Guidance, dated June, 1986; Wisconsin statutes and administrative rules in effect at the time that the Work is conducted; the requirements of this Consent Decree; the SOW; and the standards, specifications and schedules contained in the Project Plan or Work Plan approved by the WDNR under this Consent Decree. All RA Work performed under this Consent Decree shall meet the performance and cleanup standards set forth in the Record of Decision (ROD).

C. Guidance documents which are published after the effective date of this Consent Decree shall be applied prospectively to work tasks which have not yet begun. If an applicable guidance document is changed or new guidance is issued which recommends modification of the RD/RA Work Plan required under this Consent Decree, the WDNR shall provide notice, in writing, of the new or revised guidance documents. Within thirty (30) calendar days after receipt of such notice, the Settling Defendants shall submit revisions that comply with the new or revised guidance.

D. If the Settling Defendants, or their consultants, contractors or subcontractors fail to comply with any of the requirements

of this Consent Decree, the WDNR shall have the right to seek stipulated penalties from the Settling Defendants under this Consent Decree, if the WDNR elects to undertake the Work, and the right to seek enforcement of the terms of this Consent Decree where the WDNR elects not to undertake the Work. The WDNR may also refer the Site to the United States Environmental Protection Agency (referred to herein as EPA) for action pursuant to CERCLA or may seek a court order requiring the Settling Defendants and/or other identified PRPs to conduct the Work at the Site.

E. The Settling Defendants shall perform all of the activities outlined in the SOW to implement the remedy selected in the ROD, including but not limited to:

1. Source control: The Settling Defendants shall operate and maintain the existing landfill gas extraction systems, and shall continue to operate and maintain those systems after they have been modified by the additions and changes described in this paragraph. The Settling Defendants shall cap an area of uncapped waste; line a perimeter ditch to decrease leachate production and improve drainage of stormwater run-off; install two or three additional in-waste gas extraction wells to improve source removal of VOCs; and install a barrier gas extraction system to prevent gas migration away from the landfill.

2. Alternate water supply: The Settling Defendants shall offer to install and maintain, at their expense, point-of-entry granulated activated carbon filters, that have been approved by WDNR and the Wisconsin Department of Industry, Labor and Human Relations ("WDILHR"), in each home and business within the Special Well Construction Zone that is located in Sections 13, 14, 15, 22, 23 or 24 of the Town of Hudson, T29N, R19W, St. Croix County, Wisconsin, and in the Norflex Inc. facility at 720 Norflex Drive in the Town of Hudson.

3. Additional remediation that may be required if certain contingencies occur:

   a) If the groundwater remediation performance standards for the barrier gas extraction system that are set forth in the ROD are not met within one-year after the operation of the barrier gas extraction system is commenced, the Settling Defendants shall, after appropriate investigation and consultation with the WDNR, design and implement additional remedial action to bring groundwater into compliance with NR 140 groundwater

standards within a reasonable period of time. However, the WDNR may grant an extension for continued monitoring (for more than one year after commencement of operation of the barrier gas extraction system) if it determines that continued monitoring is necessary to determine whether or not the groundwater remediation performance standards are being met.

b) If methane or other combustible gas is detected at or above 25 percent of the lower explosive limit (LEL) by volume (for that gas) beyond the property boundary or at any concentration beyond the barrier gas extraction system at any time following sixty (60) days after operation of the barrier gas extraction system begins, the Settling Defendants shall take additional remedial action to prevent the migration of gas from the landfill and shall pump leachate from all areas within the landfill where leachate depths exceed two (2) feet, if WDNR determines that this measure is necessary and likely to reduce gas migration.

c) If contaminants that are detected in leachate in the landfill are detected for the first time in downgradient monitoring wells or private water supply wells, or if previously-detected contaminants have increased by an order of magnitude or more in downgradient monitoring wells or private water supply wells, at any time after operation of the barrier gas extraction system begins, the Settling Defendants shall pump leachate from all areas within the landfill where leachate depths exceed two (2) feet.

F. The Settling Defendants shall provide bottled water to each home and business within the Special Well Construction Zone that is located in Section 13, 14, 15, 22, 23 or 24, and to the Norflex Inc. facility at 720 Norflex Drive in the Town of Hudson, until such time as point-of-entry granulated activated carbon filters approved by WDNR and WDILHR or another alternative uncontaminated water supply has been made available to the homeowner or business.

G. The Settling Defendants shall complete the RD/RA Work in accordance with all requirements of this Consent Decree, the ROD, the SOW, and all other schedules submitted and approved by the WDNR under this Consent Decree.

H. The Settling Parties acknowledge and agree that neither the SOW nor any plan approval constitutes a warranty or representation of any kind that the SOW or the plan will achieve compliance with state or federal applicable or relevant and appropriate requirements (ARARs) as defined in CERCLA and the NCP.

I. The Settling Defendants shall prepare and submit documentation as delineated in the SOW.

J. All of the draft plans and reports required under the SOW shall be subject to review, modification and approval by the WDNR in accordance with the terms of this Consent Decree. The Settling Defendants shall correct all deficiencies in the plans or reports identified by WDNR and shall incorporate in the final draft all modifications required by WDNR that are consistent with the scope of the remedy selected in the ROD for the Site. At the time that the final draft plans or reports are submitted, the Settling Defendants shall submit a cover letter describing how the WDNR comments were addressed. Any disputes relating to the review, modification and/or approval by WDNR of the plans or reports shall be subject to the Dispute Resolution Provisions of Section XX of this Consent Decree.

K. The Settling Defendants shall cooperate with the WDNR in cost recovery actions against the Andersen Group. Such cooperation shall include making available for review by the WDNR and its attorneys all records relating to the Landfill and its operation and the collection of waste for disposal at the Landfill, the results of investigations to identify PRPs and any assessments or allocations of their potential liability at the Site. The WDNR agrees to treat and defend such information as confidential and privileged, attorney-client privileged, and as attorney work product, where appropriate.

L. The Settling Defendants shall make reasonable efforts to secure either a court order or a signed deed restriction from the entity or entities that hold title to the Site, which prohibits any future use or development of the property that would damage or interfere with the landfill cap or other engineering controls at the Site. If a signed deed restriction is obtained, the Settling Defendants shall provide it to the WDNR for recording at the Office of the Register of Deeds for St. Croix County.

M. The WDNR agrees to:

1. Use its best efforts to timely review and approve all report submittals, permit applications, and other documentation, approval of which is necessary to carry

out the Work.

2. Request that EPA not list the Site on the National Priorities List, as long as the Settling Defendants are in compliance with the terms of this Consent Decree.

N. The Settling Parties acknowledge and agree, and this Court finds, that the completion of the remedy selected in the ROD in accordance with the SOW and the other requirements of this Consent Order, shall be deemed to be consistent with the NCP and in compliance with all applicable or relevant and appropriate requirements (ARARs) as those terms are used in CERCLA.

O. Notwithstanding any other provision of the Consent Decree, Defendants Junker Sanitation Service, Inc., United Waste Systems, Inc., United Waste Transfer, Inc. and their parents, subsidiaries and affiliates shall not be jointly or severally liable with James L. Junker, Junker Recycling, Inc. f/k/a Junker Sanitary Landfill, Inc. and the Landfill Remediation Trust or any other Settling Defendant, to finance and perform the Work, or to fulfill any other obligations created by this Consent Decree. The first Five Hundred Thousand and no/100 ($500,000) Dollars disbursed from the escrow account established pursuant to Paragraph XXVIII A below in order to fund the work, shall be deemed to have been paid on behalf of Junker Sanitation Services, Inc., its successors, assigns, parents, subsidiaries and affiliates, including but not limited to United Waste Systems, Inc., United Waste Systems of Minnesota, Inc. and United Waste Transfer, Inc., in consideration for the covenants not to sue and contribution protection provided pursuant to Paragraph XXIV D and XXXII A and B of this Consent Decree.

The preceding paragraph does not apply to the extent that such subsidiary or affiliate (other than Junker Sanitation Service, Inc.) is itself a PRP for the Junker Landfill. In the event that a subsidiary or affiliate of United Waste Systems, Inc. or United Waste Transfer, Inc. (other than Junker Sanitation Service, Inc.) is a PRP at the site for activities undertaken by that affiliate or subsidiary at the Junker Landfill, the Trust shall have the option to pursue contribution against said affiliates and/or subsidiaries. In the alternative, said subsidiary or affiliate can join the Trust and sign on to this Consent Decree in its own right.

IX. PROGRESS REPORTS

A. The Settling Defendants shall provide written monthly progress reports to the WDNR, commencing two (2) months after the

effective date of this Decree and ending one year after the construction of the remedy is completed. Progress reports shall be submitted on a semi-annual basis during the five years following the completion of the remedy construction, and annually thereafter. Said progress reports shall be delivered to the WDNR not later than fifteen (15) calendar days after the end of the last month covered in the progress report. At a minimum, these written progress reports shall include the following:

1. A summary of all validated sampling data and the results of tests relating to the Site produced during the reporting period pursuant this Consent Decree.

2. A description and estimate of the percentage of the Work completed during the past reporting period, as well as such actions, data and plans which are scheduled for the next reporting period.

3. Target date and actual completion date for each element of activity, including the project completion, and an explanation of any deviation from the schedule in the SOW.

4. A description of difficulties, if any, encountered during the reporting period and the actions taken to rectify the problems.

5. Changes in key personnel.

6. Copies of any daily field reports and/or field inspection reports.

B. Neither failure of the WDNR to expressly approve or disapprove of a submission by the Settling Defendant within the specified time period nor the absence of comments shall be construed as approval of such submission by the WDNR.

X. SUBMISSION OF DOCUMENTS AND CORRESPONDENCE

A. The Settling Defendants may request, in accordance with s. NR 2.19, Wis. Adm. Code, that information required by the WDNR under the terms of this Consent Decree, be treated as confidential.

B. With the exception of information submitted to WDNR pursuant to Section VIII, K, attorney-client privilege and attorney-work product privilege shall not apply to documents, deliverables or data required to be submitted or made available to WDNR under Sections VIII or IX of this Consent Decree.

C. Documents and correspondence to be submitted pursuant to this Consent Decree shall be sent to the following addresses, or to such other address as the Settling Defendants or the WDNR may hereafter designate in writing.

Documents to be submitted to WDNR shall be sent to:

Bureau Director (1 copy)
Bureau of Remediation and Redevelopment
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707

District Waste Management Engineer (3 copies)
Wisconsin Department of Natural Resources
Western District Headquarters
P.O. Box 4001
Eau Claire, Wisconsin 54702

Baldwin Area Hydrogeologist (1 copy)
Wisconsin Department of Natural Resources
990 Hillcrest Street, Suite 104
Baldwin, WI 54002

Documents to be submitted to the Settling Defendants shall be sent to:

Dennis M. Sullivan
Herrick & Hart
116 West Grand Avenue
P. O. Box 167
Eau Claire, WI 54702

Kevin Spellacy
Quinliven Law Firm
600 Norwest Center
P. O. Box 1008
St. Cloud, MN 56302

James Lockhart
Lommen Nelson
1800 IDS Center
80 South Eighth Street
Minneapolis, MN 55402

D. All reports, plans, notices and other documents required to be submitted under this Consent Decree shall be deemed to be submitted on the date that they are mailed, if mailed or on the date that they are received, if delivered.

XI. MODIFICATION OF WORK

A. In the event that the WDNR or the Settling Defendants determine that either a modification to the Work or additional work not contemplated in the SOW is necessary to implement the RA or achieve compliance with the performance and cleanup standards set forth in the ROD, notification of such modified or additional work shall be provided to the other party. Any modification to the Work or additional work determined to be necessary by the Settling Defendants shall be subject to approval by the WDNR.

B. In the event that the Settling Defendants' project manager determines that a minor modification to the Work or minor additional work not contemplated by the SOW is necessary during the course of Work, oral notice may be given by the Settling Defendants' project manager to the WDNR project manager. Such oral notice shall be confirmed in writing within seven (7) calendar days after the oral notice, describing the circumstances under which the determination was made and the modification or additional work was performed.

C. During the term of this Consent Decree, any modification to the Work or additional work not contemplated by the SOW which is consistent with the scope of the remedy selected in the ROD, and which is determined by the Settling Defendants to be necessary and is approved by the WDNR, or which is determined to be necessary by the WDNR, shall be completed by the Settling Defendants in accordance with the standards, specifications and schedule determined by or approved by the WDNR.

XII. COMPLIANCE WITH OTHER LAWS

A. The RD/RA activities undertaken by the Settling Defendants pursuant to this Consent Decree shall be performed in compliance with applicable or relevant and appropriate (ARARs) federal and State requirements, whichever is the more stringent. The policies and procedures established in the NCP shall be followed in identifying and complying with ARARs. In addition to ARARs, the Settling Defendants shall incorporate any advisories, criteria or guidance (i.e. to-be-considered) that the WDNR has determined appropriate, as documented in the ROD, into the RD/RA activities.

B. The Settling Defendants shall store, treat, or dispose of investigation-derived waste that is to be handled on-site, in compliance with all applicable federal and State requirements to the extent practicable, considering the exigencies of the situation. The Settling Defendants shall ensure that waste generated during conduct of the Work that is taken off-site is

transported to a facility that is authorized to receive it under applicable statutes or rules.

C. The Settling Defendants shall be responsible for obtaining all federal, State, and/or local permits, licenses and approvals which are necessary for the performance of the Work. Nothing in this Consent Decree relieves the Settling Defendants of the obligation to obtain such permits, licenses or approvals. The WDNR project manager shall exercise his/her best efforts to facilitate the processing of any required federal or state permit, license or approval.

XIII. COMPLIANCE WITH RECORD OF DECISION

The Settling Defendants shall carry out RD/RA activities for the Site in conformance with the remedy selected in the ROD. Where there is a significant change to the ROD which requires the issuance of an Explanation of Significant Differences or a ROD Amendment (as provided in "Interim Final Guidance on Preparing Superfund Decision Documents: The Proposed Plan; the Record of Decision; Explanation of Significant Differences; The Record of Decision Amendment" OSWER Directive 9355.3-02, dated June 1989), the Settling Defendants shall comply with all elements of the changed or amended ROD, including any laws that are applicable or relevant and appropriate to that significant change.

XIV. ACCESS

A. The Settling Defendants shall use their best efforts to obtain access agreements from the present owners of the Site and any other property that may need to be accessed in order to implement Work required under this Consent Decree, within thirty (30) calendar days after the effective date of this Consent Decree, or the date that it becomes apparent that access to off-Site property is necessary, whichever is later. At a minimum, "best efforts" shall include a certified or return-receipt-requested letter to the owner requesting access which includes a proposed access agreement, and, when necessary, a) for property owners other than the owners of the site, the offer of reasonable compensation, and b) for the owners of the site, such Court motions as may be necessary to obtain orders requiring the owners to authorize and allow all necessary access. Such agreements and/or orders shall provide access for the WDNR and all authorized representatives of the WDNR, and shall be submitted to WDNR within thirty (30) days after they are obtained. In the event that such access agreements are not obtained within thirty (30) calendar days after the effective date of this Consent Decree, the Settling Defendants shall so notify the WDNR. That notification shall include a description of the "best efforts" undertaken by the Settling Defendants to gain access.

B. In the event that the Settling Defendants by their best efforts are unable to obtain access to the Site or other area where Work is to be performed hereunder, such non-access shall constitute a force majeure under this Consent Decree. In such event, the WDNR may use its authority to obtain access to the Site or other area where the Work is required to be performed.

C. The employees and authorized representatives of the WDNR and EPA shall have the authority to enter the Site at all reasonable times for the purpose of inspecting records, operating logs, contracts and other documents relevant to the implementation of this Consent Decree; reviewing the progress of the Settling Defendants in implementing this Consent Decree; conducting such tests as the WDNR project manager deems necessary; using a camera, sound or video recording, or other documentary type equipment; and verifying the data submitted to the WDNR by the Settling Defendants. The Settling Defendants shall permit such authorized representatives to inspect and copy all records, files, photographs, documents, and other writings, including all sampling and monitoring data, which pertain to this Consent Decree subject to Section X, A and B regarding confidentiality. All persons entering the Site pursuant to this Consent Decree shall comply with the health and safety plans prepared for this Site.

D. Nothing herein shall be construed as restricting the inspection or access authority of the WDNR under any statute or rule.

XV. PROJECT MANAGER

A. The WDNR and the Settling Defendants (collectively) shall each designate a project manager within thirty (30) calendar days after the effective date of this Consent Decree. Either party may change its designated project manager by notifying the other party, in writing, at least ten (10) calendar days prior to the change. Each project manager shall be responsible for assuring that communications are appropriately disseminated and processed among the respective parties.

B. The WDNR project manager or a designee shall have the authority, pursuant to this Consent Decree, to (1) take samples or direct that samples be taken; (2) direct that Work stop whenever the WDNR project manager determines that activities at the Site may create danger to public health or welfare or the environment; (3) observe, take photographs and make such other reports of the progress on the Work as deemed appropriate; (4) review records, files and documents relevant to this Consent Decree; and (5) make or authorize minor field modifications to the techniques, procedures, or design

utilized in carrying out the Work. Any field modifications shall be approved orally by both project managers. Within 72 hours following the modification, the project manager who requested the modification shall prepare a memorandum detailing the modification and the reasons therefore and shall provide and mail a copy of the memorandum to the other project manager.

C. The project manager for the Settling Defendants or a designee shall be on Site during performance of all Work undertaken on the Site.

D. The absence of the WDNR project manager from the Site shall not be cause for stoppage of Work.

XVI. SAMPLING AND DATA/DOCUMENT AVAILABILITY

A. The WDNR and the Settling Defendants shall upon request, during normal business hours, make available to each other the results of all sampling, tests and other data generated by them, or on their behalf, with respect to the Work.

B. In the event that quality assurance, quality control or chain of custody procedures are not followed properly (by the Settling Defendants' consultant or laboratory), the Settling Defendants shall notify the WDNR project manager in writing of the error, what will be done to correct the affected situation and the date on which any sampling event will be rescheduled. This notification shall be provided within ten (10) calendar days after the Settling Defendants become aware of the problem.

C. At the request of the WDNR project manager, the Settling Defendants shall allow split or duplicate samples to be taken by the WDNR during sample collection conducted during the implementation of the Work. The Settling Defendants shall have the right to take split or duplicate samples of any samples taken by the WDNR during implementation of the Work. The Settling Defendants' project manager shall endeavor to notify the WDNR project manager not less than ten (10) calendar days in advance of any sample collection. The DNR project manager shall endeavor to notify the Settling Defendants not less than ten (10) calendar days in advance of any sample collection.

XVII. QUALITY ASSURANCE

A. The Settling Defendants shall use quality assurance, quality control and chain of custody procedures in accordance with "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operation" (EPA QA/R5), "Preparing Perfect

Project Plans" (EPA/600/9-88/087) and any EPA updates to these procedures, throughout all data collection activities.

B. The Settling Defendants shall consult with the WDNR project manager in planning for, and prior to, all sampling and analysis as detailed in the RD/RA Work Plan. In order to provide quality assurance and maintain quality control with respect to all samples collected pursuant to this Consent Decree, the Settling Defendants shall:

1. Ensure that the WDNR employees and authorized representatives of the WDNR are allowed access to any laboratory and personnel utilized by the Settling Defendants for analyses;

2. Ensure that all sampling and analyses are performed according to EPA methods or other methods deemed satisfactory by the WDNR and include all protocols to be used for analyses in the Quality Assurance Project Plan;

3. Ensure that all laboratories utilized by the Settling Defendants for analyses of samples are certified or registered under ch. NR 149, Wisconsin Administrative Code, and participate in a quality assurance/quality control program equivalent to that which is followed by the EPA. As part of such a program, and upon request by the WDNR, the Settling Defendants shall have analyses performed by the laboratories that it uses of samples provided by the WDNR to demonstrate the quality of analytical data for each such laboratory.

XVIII. FORCE MAJEURE

A. The Settling Defendants shall cause all Work to be performed within the time limits set forth in this Consent Decree or the SOW, unless performance is delayed or prevented by events that constitute a force majeure. For purposes of this Consent Decree, a "force majeure" is an event, including inability to obtain any necessary governmental permits or approvals, arising from causes beyond the reasonable control of the Settling Defendants or any entity controlled by the Settling Defendants, including their contractors and subcontractors, that delays or prevents performance of any obligation under this Consent Decree despite the Settling Defendants' best efforts to fulfill the obligation, including using best efforts to anticipate potential force majeure events. "Force majeure" includes foreseeable occurrences for which a response is not feasible. Increases in cost or changes in economic circumstances shall not by themselves constitute a "force majeure." However, an event that would otherwise constitute a force majeure shall be deemed force majeure even though such

event also results in increased costs or changed economic circumstances. "Force majeure" does not include financial inability to complete the Work or a failure to attain performance standards in the ROD.

B. The Settling Defendants shall notify the WDNR in writing no later than seven (7) calendar days after becoming aware of any event which the Settling Defendants contend is a force majeure. Such notification shall describe the anticipated length of the delay, the cause or causes of the delay, the measures taken and to be taken by the Settling Defendants to minimize the delay, and the timetable by which these measures will be implemented. The Settling Defendants shall have the burden of demonstrating that the event is a "force majeure." Failure to comply with the above requirements shall preclude the Settling Defendants from asserting any claim of "force majeure" for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. The Settling Defendants shall be deemed to know of any circumstance of which the Settling Defendants' representatives, any entity controlled by the Settling Defendants, or the Settling Defendants' contractors knew or should have known.

C. The WDNR shall, within fourteen (14) calendar days after receiving notice from the Settling Defendants, provide the Settling Defendants with a written decision as to whether the event described in the Settling Defendants' notice constitutes a "force majeure."

D. If the WDNR agrees that a delay is attributable to a "force majeure," the time period for a performance under this Consent Decree, including for submission of affected subsequent deliverables, shall be extended for a time period attributable to the event constituting a "force majeure" unless the WDNR determines that it will terminate this Consent Decree because the Settling Defendants are unable to proceed to fulfill their material obligations under this Consent Decree within a time period reasonably acceptable to the WDNR. Any disputes between the Settling Defendants and the WDNR concerning a WDNR decision that: (i) an event is not a force majeure, or (ii) this Consent Decree is terminated for reasons described in the preceding sentence of this Paragraph, are subject to the Dispute Resolution Procedures set out in Section XX of this Consent Decree. Deadlines that are the subject of a dispute are tolled for the pendency of dispute resolution.

XIX. STIPULATED PENALTIES

A. The Settling Defendants shall be liable for payment to the State of the sums set forth in this Section as stipulated

penalties for each week that the Settling Defendants fail to submit a plan, report or other document or fails to complete the RD or the RA in accordance with the requirements of this Consent Decree, unless: (i) the WDNR determines that such a delay is attributable to a "force majeure" as defined in Section XVIII; (ii) the delay in question is unavoidable because the plan, report or other document or the required action is the subject of pending dispute resolution under Section XX, or (iii) the WDNR, in its discretion, waives the payment of stipulated penalties. Such sums shall be due and payable within sixty (60) calendar days after receipt of notification from the WDNR assessing the stipulated penalties. These stipulated penalties shall accrue in the following amounts:

1. For failure to submit any plan, report or other document (except those reports covered by paragraph A, 2. of this Section):

Amount	Period
$1000 per week	1 to 2 weeks
$1250 per week	3 to 4 weeks
$2000 per week	5 or more weeks

2. For failure to complete the RD or any component of the RA in accordance with the SOW or any schedule approved by the WDNR:

Amount	Period
$1000 per week	1 to 2 weeks
$2000 per week	3 to 4 weeks
$5000 per week	5 or more weeks

B. The stipulated penalties provisions set forth in paragraph A of this Section shall not preclude the WDNR from electing to pursue any other remedy or sanction because of the Settling Defendants' failure to comply with any of the terms of this Consent Decree, including a lawsuit to enforce the terms of this Consent Decree.

XX. DISPUTE RESOLUTION

A. The Settling Parties shall use their best efforts to in good faith resolve all disputes or differences of opinion with respect to this Consent Decree informally through the project managers. If, however, any dispute arises concerning matters under or subject to this Consent Decree, including additional work determined by the WDNR to be necessary pursuant to Section XI, which dispute the parties are unable to resolve informally within twenty-one (21) calendar days thereof, the Settling Defendants shall present a written notice of such dispute to the WDNR, which shall set forth specific points of dispute, the position of the Settling Defendants and the technical basis

therefor, and any actions which the Settling Defendants consider necessary.

B. Within twenty-one (21) calendar days after receipt of such a written notice, the WDNR shall provide a written response to the Settling Defendants setting forth its position and the basis therefor. The Settling Defendants may respond to the WDNR's response within fourteen (14) calendar days of its receipt. During the fourteen (14) calendar days following receipt of the Settling Defendants' response to WDNR's stated position, the WDNR shall attempt to negotiate in good faith a resolution of the differences. If requested by the Settling Defendants, the WDNR shall (i) schedule a meeting with representatives of the Settling Defendants, WDNR staff and the Director of the Bureau of Remediation and Redevelopment to attempt to resolve the issue, and/or (ii) extend the period of negotiation up to an additional twenty-one (21) calendar days if good faith negotiations are proceeding. The WDNR and the Settling Defendants agree that they will consider the use of alternative dispute resolution, including mediation, in appropriate circumstances.

C. Following the expiration of the time periods described in paragraph B of this Section, if the WDNR concurs with the position of the Settling Defendants, the Settling Defendants shall be so notified in writing and this Consent Decree shall be modified to include any necessary extensions of time or variances of Work. If the WDNR does not concur with the position of the Settling Defendants, the WDNR shall resolve the dispute in good faith, taking due account of the position of the Settling Defendants, based upon and consistent with the terms of this Consent Decree, and shall provide written notification of such resolution to the Settling Defendants.

D. The pendency of dispute resolution under this Section shall not affect the time period for completion of Work and affected subsequent deliverables or obligations to be performed under this Consent Decree which are not subject to dispute. Notwithstanding the foregoing, upon mutual agreement of the WDNR and the Settling Defendants, any time period may be extended not to exceed the actual time taken to resolve the dispute.

E. Upon resolution of any dispute, whether informally or using the procedures in this Section, any additions or modifications required as a result of such dispute resolution shall immediately be incorporated, if necessary, into the appropriate plan or procedure and to this Consent Decree. The Settling Defendants shall proceed with all remaining Work according to the modified plan or procedure.

F. In any proceeding to enforce the terms of this Consent Decree, the Settling Defendants may defend on the basis that the WDNR's action, or lack thereof, was arbitrary and capricious, in addition to any other available defenses. If the court finds that the WDNR's actions or failures to act were arbitrary and capricious, not in conformance with this Decree, or otherwise contrary to law, the court may exercise such legal and equitable powers as it deems appropriate.

G. All notices and written responses required by this Section shall be placed into the WDNR's administrative record for the Site.

XXI. COMMUNITY RELATIONS

The Settling Defendants shall be responsible for conducting the community relations activities for this Site. The Settling Defendants shall prepare a Community Relations Plan for the dissemination of project information to the public, and shall implement the Community Relations Plan after it has been approved by the WDNR. The Settling Defendants shall prepare the community relations documents, as specified in the NCP, CERCLA, and the EPA guidance, "Community Relations in Superfund: A Handbook", dated January, 1992, including any supplements or updates to the handbook issued by EPA. The Community Relations Plan shall be subject to review, modification and approval by the WDNR. The Settling Defendants shall correct all deficiencies identified by the WDNR in the preliminary draft of the Community Relations Plan and shall incorporate all modifications required by the WDNR in the final draft. The Community Relations Plan shall be incorporated into the RD/RA project plan submittal and the Settling Defendants shall conduct community relations activities in compliance with the schedule that has been approved by the WDNR.

XXII. ADMINISTRATIVE RECORD REQUIREMENTS

The WDNR shall compile and maintain the administrative record files for the Site. Any documents incorporated herein by reference constitute part of the administrative record. The WDNR must place into the administrative record all documents that the Settling Defendants request be added to the administrative record. In the event that the WDNR determines that the administrative record should be supplemented after the signature of the ROD, the Settling Defendants shall provide the WDNR with all relevant documents requested by the WDNR, unless the documents are privileged under an attorney-client privilege or attorney-work-product privilege.

XXIII. RECORD PRESERVATION

The Settling Defendants agree to preserve, during the pendency of this Consent Decree, and for a minimum of six (6) years after termination of this Consent Decree, one original or one legible copy of all records and documents of the Settling Defendants which are in the possession of the Settling Defendants, or in the possession of any employee, agent, accountant, or contractor, or any attorney of any of the Settling Defendants, which are generated pursuant to this Consent Decree, the SOW or the RD/RA Work Plan. After this six (6) year period, the Settling Defendants shall notify the WDNR, in writing, at least sixty (60) calendar days prior to the destruction or disposal of any such documents. Upon request of the WDNR, the Settling Defendants shall make available to the WDNR such records, or copies of any such records. This Section is intended to preserve records, related to implementation of this Consent Decree, or copies of any such records, and is not intended nor shall be construed to be a waiver of, or in any other way to diminish the full availability to the Settling Defendants, of any attorney-client, attorney-work-product, or other privilege which may apply to such information.

XXIV. RESERVATION OF RIGHTS

A. Except as otherwise provided in Section XXXII of this Consent Decree, nothing herein shall waive the right of the WDNR to enforce this Consent Decree, or to take any action pursuant to CERCLA, ch. 144, Wis. Stats., or any other available legal authority. In addition, the WDNR reserves the right, following thirty (30) calendar days after written notice to the Settling Defendants, to undertake any portion of the Work that it alleges is the responsibility of the Settling Defendants under this Consent Decree that is not undertaken or completed within the time specified in this Consent Decree, the SOW, or a plan or schedule that has been approved by the WDNR pursuant to this Consent Order, and to enforce the terms of the Consent Decree where the WDNR has not undertaken the Work, if the Settling Defendants fail to satisfactorily perform the tasks required of it under this Consent Decree by the end of the thirty (30) calendar day notice period. If the WDNR conducts any Work pursuant to this paragraph that is allegedly the responsibility of the Settling Defendants under this Consent Decree, it cannot also commence or maintain an action to compel the Settling Defendants to conduct Work already completed by the WDNR in a manner consistent with this Consent Decree. However, the WDNR shall have the right to seek recovery from the Settling Defendants for any costs reasonably incurred in undertaking such Work upon the failure of the Settling Defendants, their agents, contractors or subcontractors to proceed according to the requirements of this Consent Decree.

B. Except as otherwise provided in Sections VIII, XXV, and XXXII, of this Consent Decree, nothing herein is intended to release, discharge or in any way affect any claims, causes of action or demands in law or equity which the Settling Defendants or the WDNR may have against any other person, firm, partnership or corporation (collectively "Other Person") for any liability such Other Person may have arising out of, or relating in any way to, the generation, storage, treatment, handling, transportation, release or disposal of any materials, hazardous substances, solid or hazardous waste, contaminants or pollutants at, to or from the Site. The parties to this Consent Decree expressly reserve all rights, claims, demands and causes of action they may have against any and all Other Persons.

C. The WDNR recognizes that the Settling Defendants may have the right, subject to the provisions of Section XXV of this Consent Decree, to seek contribution, indemnity and/or any other available remedy against any Other Person found to be responsible or liable for contribution, indemnity or otherwise for any amount which has been or will be expended by the Settling Defendant in connection with the Site.

D. The Settling Parties agree and the Court finds that the Settling Defendants are entitled to such protection from contribution actions or claims as is provided by CERCLA Section 113 (f)(2), 42 U.S.C. s. 9613 (f)(2). The aforesaid protection from contribution actions or claims is intended to be the maximum available and to apply to any and all past, present and future claims of any entity against the Settling Defendants pursuant to CERCLA, Wisconsin statutory or common law, arising from the ownership, operation, possession, control of the Junker Landfill and the transportation and disposal of all waste, to including but not limited to hazardous substances and any releases of hazardous substances in to the environment associated with the Junker Landfill, including but not limited to all claims that were or could have been alleged in the complaint filed in this matter, whether such claims exist at the time of entry of this consent decree or arise or are asserted subsequent thereto, and irrespective of the person asserting said claim or claims. Potentially responsible parties who reach a settlement agreement with the Landfill Remediation Trust, who execute such documents as are required by the Settling Parties and the Court, will receive the contribution protection provided herein.

E. Nothing herein shall be construed to release the Settling Defendants from any liability for failure to perform the Work in accordance with this Consent Decree. Upon receipt of written notice of satisfaction as provided in Section XXXI of this Consent Decree, the Settling Defendants shall have no

further obligations under this Consent Decree. The Settling Parties expressly recognize that this Consent Decree does not represent a waiver of any claim of the United States or the U.S. EPA against the Settling Defendants relating to the Site (including claims to require the Settling Defendants to undertake further response actions and claims to seek reimbursement of response costs pursuant to Section 107 of CERCLA).

F. Nothing herein shall be construed to release the Settling Defendants from any liability for conditions at the Site or in the groundwater at the Site or within the groundwater aquifer that are not known to the WDNR at the time that this Consent Decree is signed, which when analyzed (together with any other relevant information) indicate that the remedial actions taken under this Consent Decree are not protective of human health or the environment. As used in this paragraph, conditions known to the WDNR at the time that this Consent Decree is signed are only those conditions set forth in the Record of Decision for the Site and the administrative record supporting that Record of Decision.

G. Nothing herein is intended to be a release or settlement of any claim for personal injury or property damage to any person not a party to this Consent Decree.

XXV. REIMBURSEMENT OF COSTS

A. Shortly after the end of each state fiscal year following the effective date of this Consent Decree, the WDNR shall submit a cost summary to the Settling Defendants of all oversight costs and other response costs incurred by the WDNR with respect to this Consent Decree during the previous fiscal year, including, but not limited to, the costs incurred by the WDNR, if any, in having a qualified person oversee the conduct of the RD/RA. The WDNR agrees to provide quarterly reports to the Settling Defendants which summarize the activities that have been performed by WDNR personnel on the project. Within sixty (60) calendar days after the receipt of each such cost summary, the Settling Defendants shall pay to the WDNR the full amount of the costs incurred during the preceding fiscal year, subject to the dispute resolution provisions of Section XX.

B. Payments to the WDNR for costs incurred by the WDNR shall be made payable to the Wisconsin Department of Natural Resources and shall be mailed or delivered to: Wisconsin Department of Natural Resources, Bureau Director, Bureau of Remediation and Redevelopment, 101 S. Webster Street, P.O. Box 7921, Madison, Wisconsin 53707-7921. A copy of the transmittal letter shall be sent to the WDNR project manager.

C. The Settling Parties shall cooperate in cost recovery actions against the Andersen Group, who are not and will not be allowed to become members of the Landfill Remediation Trust, unless agreed to by the State. Such cooperation shall include making available records relating the results of investigations as to the Andersen Group activities with respect to the site and any assessments/ allocations of their potential liability at the Site. The parties agree to treat and defend such information as confidential and privileged, attorney-client privileged, and attorney work product, where appropriate.

D. The State agrees to seek to recover no more than $2 million of the past costs it has incurred at the Site, and to seek to recover those past costs only from the Andersen Group.

E. The Settling Defendants agree that the State shall be allocated the first $2 million in past costs recovered from the Andersen Group, and any such judgment shall not be first reduced to pay attorneys fees or costs or otherwise be reduced in any manner for expenditures incurred by the Settling Defendants. The State agrees that the Settling Defendants shall have anything in excess of $2 million recovered from the Andersen Group, subject to the provisions of section XXVIII. B.

F. The State further agrees to not seek to recover any of its past costs from any PRP other than the Andersen Group. The Settling Defendants may seek to recover any portion of their costs to which they are entitled from these other (non-Andersen Group Defendant) PRPs, and to keep the entire proceeds from any such recovery, subject to the provisions of section XXVIII. B.

G. The Settling Defendants will not agree to a settlement with any or all of the Andersen Group Defendants without the consent of the State, and the State, similarly, will not agree to a settlement with any or all of the Andersen Group Defendants without the consent of the Settling Defendants, except as provided for herein. If either of the Settling Parties receives a settlement proposal from any or all of the Andersen Group Defendants, that party will consult with the other Settling Party to determine whether the offer should be accepted. If they are not, after said consultation and a good faith effort, able to arrive at an agreement on the acceptability of the settlement offer, the matter will be referred to the federal magistrate for this District for mediation.

XXVI. INDEMNIFICATION

A. The Settling Defendants agree to indemnify and save and hold the State of Wisconsin, including the WDNR, and their officers, employees and authorized representatives, harmless from any and

all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of the Settling Defendants, their officers, employees, receivers, trustees, agents, assigns or authorized representatives, in carrying out the Work. Further, the Settling Defendants agree to pay the State all of the costs that it incurs (including, but not limited to, attorneys fees and other expenses of litigation and settlement) arising from, or on account of, claims made against the State based on negligent or other wrongful acts or omissions of the Settling Defendants, their officers, directors, employees, agents, contractors, subcontractors, and any persons acting on their behalf or under its control, in carrying out the activities required by this Consent Decree. However, the Settling Defendants shall not be responsible for indemnification and are not required to save or hold harmless any State of Wisconsin or WDNR officer, employee, authorized representative or unauthorized representative for claims or causes of action arising out of their acts or omissions at the Site.

B. The WDNR and the State do not assume any liability by entering into this Consent Decree or by virtue of any designation of the Settling Defendants as WDNR's authorized representative(s) under s. 144.442(6)(e) or 144.76(8), Wis. Stats. Neither WDNR nor the State shall be considered a party to any contract entered into by the Settling Defendants to carry out the Work that is required under this Consent Decree. Neither the Settling Defendants nor any contractor or subcontractor of the Settling Defendants shall be considered an agent of the State. Likewise, the Settling Defendants are not considered to be a party to any contract entered into by the WDNR or the State of Wisconsin to carry out the provisions of this Consent Decree.

C. If an entity indemnified under this Section receives notice of a claim or action covered by this indemnity, it shall notify the indemnifying party immediately of any such claim or action. Further, the indemnified entity shall keep the indemnifying party apprised of how the claim or action is proceeding through its resolution, and shall vigorously defend said claim or action. The indemnified entity shall notify the indemnifying party, in advance, of any intention to settle a claim covered by this Section.

XXVII. NOTIFICATION OF OUT-OF-STATE SHIPMENTS

As soon as possible after the identification of any location outside Wisconsin to which a shipment of hazardous substances of greater than ten (10) cubic yards from the Site is expected to be made and, in all cases, prior to any such shipment, the Settling Defendants shall provide written notification of such shipment to the appropriate environmental official of the state receiving the

substances. The notification shall include, at a minimum: 1) the name and location of the facility to which the hazardous substances are being shipped; 2) the type and quantity of the hazardous substances being shipped, including the Department of Transportation shipping code, if any; 3) the schedule for shipment of the hazardous substances; 4) the method of transportation; and 5) any other relevant information, including any special procedures necessary to respond to an accidental release of the substances during transportation. The Settling Defendants shall promptly notify the official of the receiving state and the WDNR in writing of any changes to the shipment plan.

XXVIII. ASSURANCE OF FINANCIAL ABILITY TO COMPLETE THE WORK AND LIABILITY INSURANCE REQUIREMENTS

A. Within 60 days after the Landfill Remediation Trust signs this Consent Decree, the Settling Defendants shall provide WDNR with documentation to prove that a minimum of Three Million Dollars ($ 3,000,000) in the form of promissory notes payable by UWS to James Junker and Debra Junker are held by UWS pursuant to an Escrow Agreement. The principal payable pursuant to said notes shall held for the sole and exclusive purpose of funding the Work that the Settling Defendants are committing to conduct under this Consent Decree, including long-term operation, maintenance and monitoring of the remedy. The terms of the Escrow Agreement shall be incorporated into this Consent Decree and it shall be enforceable hereunder. Any interest income derived from the balance of the notes held in escrow, if any, shall be payable to James Junker, Debra Junker, their heirs and assigns, pursuant to the terms of the notes. At no time shall the principal of the notes be paid for any purpose other than in payment for Work done in connection with this Consent Decree. Payments for Work done in connection with this Consent Decree shall be paid from this escrow account until such time as the balance of this account reaches zero. All subsequent payments may be paid pursuant to paragraph B., below.

B. Within 60 days after the Landfill Remediation Trust signs this Consent Decree, the Settling Defendants shall provide WDNR with documentation to prove that a (second) irrevocable escrow account has been created at a bank or financial institution that is examined and regulated by a federal agency, or in the case of a bank or financial institution located within the State of Wisconsin, which is examined and regulated by a state or federal agency. This account shall also be established for the purpose of funding the Work that the Settling Defendants are committing to conduct under this Consent Decree, including long-term operation, maintenance and monitoring of the remedy. Seventy five percent (75%) of any and all monies received by any of the Settling Defendants from any source related to the Landfill or the remediation thereof after April 15, 1996,

including, but not limited to proceeds from any insurance policy or policies, or any payment from any other PRP, shall be deposited in this account until such time as one million seven hundred thousand dollars, (1,700,000.00) have been deposited. All interest earned on this account shall be maintained in this account. No withdrawal shall be made from this account for any purpose until such time as the balance of the (first) escrow account held by UWS pursuant to paragraph A., above, is depleted to zero. It is the intention of the Settling Parties that this fund be considered a designated settlement fund within the meaning of 26 U.S.C.S. 468.

C. The balance maintained in either account created to satisfy the requirements of this Section may, with the prior written approval of the WDNR, be reduced as the Work is completed. However, financial assurance that is sufficient to fund all of the Work that remains to be completed shall be maintained by the Settling Defendants at all times prior to the termination of this Consent Decree. The WDNR may require periodic reports from the Settling Defendants to assure that sufficient financial assurance exists at that time.

D. No later than 15 days before commencing any on-site Work, the Settling Defendants shall secure and shall maintain, until the Settling Defendants receive written notice from WDNR pursuant to Section XXXI that all of the requirements of the Consent Decree have been complied with, comprehensive general liability insurance with a combined single limit of not less than $1,000,000 per occurrence and $2,000,000 aggregate, automobile liability insurance covering all owned, non-owned and hired vehicles engaged in or about the work site, with a combined single limits of $1,000,000 and worker's compensation insurance which fully meets the requirements of any worker's compensation law that is applicable at the location where the work is performed. If the Settling Defendants demonstrate by evidence satisfactory to WDNR that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in lesser amount, then, with respect to that contractor or subcontractor, the Settling Defendants need provide only that portion of the insurance described above which is not maintained by the contractor or subcontractor.

E. UWS does not, by its agreement under this section, admit any liability for the Landfill or environmental contamination associated therewith, inasmuch as it acquired the Junker Sanitation businesses after the Landfill was closed and did not, as part of this acquisition, agree to assume any liability with respect to the Landfill.

XXIX. EFFECTIVE DATE

The effective date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court. If for any reason the Court should decline to approve of this Consent Decree, or any portion thereof, this Consent Decree is voidable by any party.

XXX. SUBSEQUENT AMENDMENT

In addition to the procedures set forth in Sections XI, XV and XXIX of this Consent Decree, this Consent Decree may be amended by mutual agreement of the WDNR and the Settling Defendants. Any material modification of this Consent Decree shall be in writing, signed by the WDNR and the Settling Defendants, and shall have as its effective date that date on which the amendment is approved by the Court. Modifications to the SOW or this Consent Decree which do not materially alter or conflict with the terms of this document may be made by written agreement between the WDNR and the Settling Defendants, signed by the WDNR and the Settling Defendants, and shall have as the effective date the latest date on which it has been signed by both parties.

XXXI. TERMINATION AND SATISFACTION

The provisions of this Consent Decree shall be deemed satisfied upon receipt by the Settling Defendants of written notice from the WDNR that the Settling Defendants have documented that all of the requirements of this Consent Decree, including any modified or additional work required by any amendments or any written agreements made pursuant to Section XXX, have been complied with in accordance with the terms of this Consent Decree and of any such amendments or any such written agreements to the satisfaction of the WDNR. Upon such demonstration by the Settling Defendants, said written notice shall not be unreasonably withheld or delayed by the WDNR.

XXXII. COVENANTS NOT TO SUE

A. Except as otherwise provided in Section XXIV (Reservation of Rights), from the effective date of this Consent Decree, for as long as the terms herein are complied with, and after termination of this Consent Decree pursuant to the provisions of Section XXXI (Termination and Satisfaction) and payment to WDNR of amounts due as stipulated penalties, oversight costs or other response costs under this Consent Decree, the State covenants not to sue the Settling Defendants regarding: (a) Work satisfactorily performed by the Settling Defendants in accordance with the requirements of this Consent Decree; and (b) Amounts actually paid to the WDNR by the Settling Defendants in accordance with the requirements of this Consent

Decree. Work shall be deemed to have been satisfactorily performed if it was performed in accordance with all applicable requirements referenced in Section VIII (Performance of the Work).

B. The WDNR and the State hereby waive any claim that they may have against the Settling Defendants for response costs and oversight costs related to the Site that were incurred by the WDNR prior to the signing of the ROD for the Site .

C. The Settling Defendants hereby waive all claims against the WDNR and the State, and covenant not to sue the WDNR or the State, for damages, reimbursement of costs or any other claim that the Settling Defendants may have against WDNR or the State relating to the Junker Sanitary Landfill Site.

XXXIII. SIGNATORIES AND SERVICE

Each undersigned representative of the Settling Defendants, the Wisconsin Department of Natural Resources, or the Wisconsin Department of Justice hereby certifies that he or she is fully authorized to execute and legally bind the party which he or she represents to this Consent Decree. The Settling Defendants shall identify, on the attached signature page, the name, address, of an agent who is authorized to accept service of process by mail on behalf of the Settling Defendants with respect to all matters arising under or relating to this Consent Decree. The Settling Defendants hereby agree to accept service by mail, including, but not limited to service or waiver of service of a summons, in accordance with Rule 4 of the Federal Rules of Civil Procedure and any applicable local rule of this Court.

XXXIV. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT

A. This Consent Decree shall be lodged with the Court for a period of not less than thirty (30) days for public notice and comment in accordance with Sections 122(d)(2) of CERCLA, 42 U.S.C. §§ 9622(d)(2) & 9622(i), and 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations which indicate that the Consent Decree is inappropriate, improper, or inadequate. Settling Defendants and Third Party Defendants consent to the entry of this Consent Decree without further notice.

B. If for any reason the Court should decline to enter this Consent Decree in the form presented, this agreement is voidable at the sole discretion of any party and the terms of the agreement may not be used as evidence in any litigation between the Parties.

SO ORDERED THIS _____ DAY OF _____, 19 ____.

_____
United States District Judge

The parties whose signatures appear on separate signature pages, hereby agree to the terms of this Consent Decree.

FOR THE STATE OF WISCONSIN
WISCONSIN DEPARTMENT OF JUSTICE
JAMES E. DOYLE, ATTORNEY GENERAL

By: _____ Date: _____

Shari Eggleson
Assistant Attorney General
Wisconsin Department of Justice
123 W. Washington Street
P.O. Box 7857
Madison, Wisconsin 53707-7857

By: _____ Date: _____

Frank Remington
Assistant Attorney General
Wisconsin Department of Justice
123 W. Washington Street
P.O. Box 7857
Madison, Wisconsin 53707-7857

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

By: _____ Date: _____

George E. Meyer, Secretary
Wisconsin Department of Natural Resources
101 S. Webster Street
P.O. Box 7921
Madison, Wisconsin 53707-7921

The undersigned hereby agrees to the terms of this Consent Decree, relating to the Junker Sanitary Landfill Inc. Site.

FOR United Waste Systems, Inc.
(Name of Settling Defendant)

By: _____ Date: 5-15-96
(Your Signature)

Name: John N. Milne
(Please print)

Title: Senior Vice President
(Relationship to Settling Defendant)

Mailing Address:

Four Greenwich Office Park
Greenwich, CT 06830

Agent Authorized to Accept Service on Behalf of the Above-Named Party:

Name:
Title:
Address:
Phone Number:

The undersigned hereby agrees to the terms of this Consent Decree, relating to the Junker Sanitary Landfill Inc. Site.

FOR United Waste Transfer, Inc.
(Name of Settling Defendant)

By: _____ Date: 5-15-96
(Your Signature)

Name: John N. Milne
(Please print)

Title: President
(Relationship to Settling Defendant)

Mailing Address:

Four Greenwich Office Park
Greenwich, CT 06830

Agent Authorized to Accept Service on Behalf of the Above-Named Party:

Name:
Title:
Address:
Phone Number:

The undersigned hereby agrees to the terms of this Consent Decree, relating to the Junker Sanitary Landfill Inc. Site.

FOR Junker Sanitation Service, Inc.
(Name of Settling Defendant)

By: _____ Date: 5-15-96
(Your Signature)

Name: John N. Milne
(Please print)

Title: President
(Relationship to Settling Defendant)

Mailing Address:

Four Greenwich Office Park
Greenwich, CT 06830

Agent Authorized to Accept Service on Behalf of the Above-Named Party:

Name:
Title:
Address:
Phone Number:

The undersigned hereby agrees to the terms of this Consent Decree, relating to the Junker Sanitary Landfill Inc. Site.

FOR James L. Junker
(Name of Settling Defendant)

By: _____ Date: 5-16-1996
(Your Signature)

Name: James L. Junker
(Please print)

Title: Individual
(Relationship to Settling Defendant)

Mailing Address:

P.O. Box 1340
Long Key, Florida 33001-1340

Agent Authorized to Accept Service on Behalf of the Above-Named Party:

Name:
Title:
Address:
Phone Number:

The undersigned hereby agrees to the terms of this Consent Decree, relating to the Junker Sanitary Landfill Inc. Site.

FOR Junker Recycling, Inc f/k/a Junker Sanitary Landfill, Inc
(Name of Settling Defendant)

By: _____ Date: 5/10/96
(Your Signature)
Its President

Name: James L. Junker
(Please print)

Title: President
(Relationship to Settling Defendant)

Mailing Address:

P.O. Box 1340
Long Key, Florida 33001-1340

Agent Authorized to Accept Service on Behalf of the Above-Named Party:

Name:
Title:
Address:
Phone Number:

The undersigned hereby agrees to the terms of this Consent Decree, relating to the Junker Sanitary Landfill Inc. Site.

FOR Landfill Remediation Trust.
(Name of Settling Defendant)

By: _____ Date: 5-16-1996
(Your Signature) It's Trustee

Name: James L. Junker
(Please print)

Title: Trustee
(Relationship to Settling Defendant)

Mailing Address:

c/o Herrick, Hart, et al.
P.O. Box 167
Eau Claire, Wisconsin 54702

Agent Authorized to Accept Service on Behalf of the Above-Named Party:

Name:
Title:
Address:
Phone Number:

APPENDIX B
LEACHATE PUMPING TEST DATA

DAMES & MOORE

Sheet No.
Calc. No.
Rev. No.

Job No. 33178-002 Job Tinker LF By [illegible] Date 3/13/96

Client Subject Chk'd. Date

Leachate will be pumped by a suction pump out at a discharge rate of 5.1 gpm. This will be under gravity flow conditions within the header pipe.

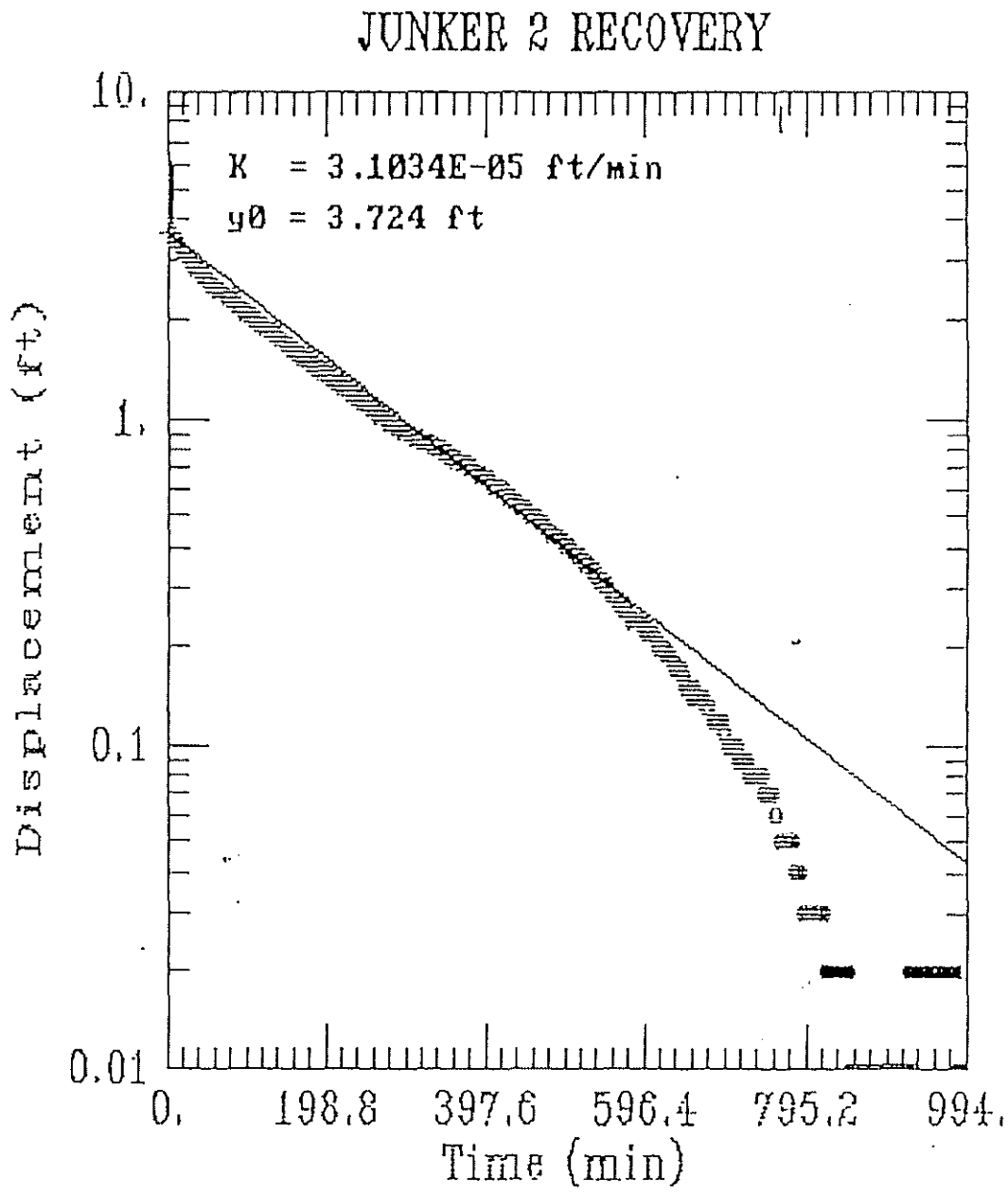
Pumping Rate: $0.1 \frac{gal}{min} \times \frac{cf}{7.48 gal} = 0.013 \frac{cf}{min}$

Header Pipe Cross-Sectional Area

3"ϕ $A = \pi r^2 = \pi \left(\frac{1.5}{12}\right)^2 = 0.049$ sf

4"ϕ $A = \pi \left(\frac{2}{12}\right)^2 = 0.087$ sf

Header Pipe is sufficiently sized to handle combined flows.


JUNKER 2 RECOVERY
K = 3.1034E-05 ft/min
y0 = 3.724 ft
10.
1.
0.1
0.01
Displacement (ft)
0.
198.8
397.6
596.4
795.2
994.
Time (min)

DAMES & MOORE

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Job No. 33179-002-192 Job
By Date 11/7/90
Client Subject
Chk'd. Date

ACTUAL TIME	RUNNING TIME	6" WELL	2" WELL	FLOW RATE
11:50		57.82		
11:51:		57.42		
11:52:20		57.18		Generator closed pump failure ~1
1307:00		56.92		Prior to pump start
1308:45		58.80		2.06
1309:30		59.20		~0.8 gpm 2.28
1310:15			58.91	
1310:45		59.70		
1311:45		59.95		
1312:30			58.85	
1316:05		59.70		
1316:50			58.84	
1317:30		59.44		pump stopped (pump failure)
1319:00		58.02		
1319:30		57.66		
1319:40		57.40		
1319:45		57.30		
1319:58		57.20		
1320:00		57.10		
1320:08		57.00		
1320:13		56.90		
1320:20		56.80		
1320:25		56.70		
1320:34		56.50		
1320:40		56.40		
1320:45		56.30		
1320:50		56.20		
1320:57		56.00		
1321:12		55.78		
1321:20		55.70		
1321:35		55.68		
1322:07		55.74		
1322:40		55.88		

DAMES & MOORE

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Job No. 33176-002-192 Job
Client Subject

- STORAGE VOLUME
1.5 GAL / 1 FT
FOR 6" PIPE

ACTUAL TIME	RUNNING TIME	6" well	2" well	FLOW RATE
8/4 START		55.62 ←	59.56	
1538:00	START OF TEST	"	"	1.0 gpm
1539 20		58.00		
1539:40		58.35		
45		58.45		
52		58.50		
1540: 03		58.63		
1540: 15		58.80		
1540:35		59.00		dif. 5.28'
1541:00		59.20		
1541:25		59.45		6 min. × 1.5 GAL / 7.92 GAL
1541:35		59.55		SEE ONLY PAGE OVER.
1542:20		59.80		
1542:40		60.20		
1542:53		—	59.40	
1543:00		60.40		
1543:23		60.55		
:37		60.72		
153		60.85		
1544:00		60.90 ←		
1544:10		61.00		
1544:20		61.10		
1544:30		61.21		
1544:50		61.40		
1545:08		61.50		
1545:12		61.60		
1545:24		61.70		
1546:30			59.30	
1546:57			59.34	
1548:25		63:50		
1549:05		63.90		
1549:30		64.15		
1549:55		64.50		
1550: 20		64.92		

DAMES & MOORE

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A.T.	R.T.	6" WELL	2" WELL	FLOW RATE
1550:50		65.26		
1551:20		65.26		
1551:35		65.24		1550 2.8 gpm
1552:00		65.24		1552 6.5 gpm
1552:35		65.24		~ 0.18 GPM
1554:15			58.96	
1554:50			59.50	
1555:08			59.50	2 min
1555:25			59.48	for information
1557:20		64.44		
1557:33		64.40		
1558:24		64.34		pump off 1558:34
1559:55		62.00		
1601:30			59.36	
1601:50			59.36	
1602:25			59.30	
1603:08			59.22	
1603:38			59.32	
1603:55			59.32	
1604:20		61.50	59.32	
1605:03			59.28	
1605:35			59.28	
1606:07			59.32	
1607:15			59.30	
1608:05			59.25	
1608:30			59.24	
1608:55			59.24	
1609:25			59.20	
1610:10			59.26	
1610:25			59.20	
1610:55		61.40	59.24	
1611:20			59.24	
1612:10			59.24	
1612:40			59.23	

DAMES & MOORE

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Job No. Job
Client Subject

AT	ET	6" mon	2"	Remarks
1613:20			59.23	
1614:20			59.23	
1615:05			59.24	
1616:10			59.24	
1617:15			59.24	
1618:08			59.25	
1619:09			59.26	
1621:30			59.22	
1622:20		* 61.20	59.20	Require adjustment
1623:15		* 61.15	59.21	
1624:00		* 61.15	59.20	
1625:25			59.28	
1626:20			59.28	
1627:10			59.28	
1628:08			59.29	
1629:00			59.29	
1630:00			59.29	
1631:00		59.88	59.29	
1632:45			59.32	
1633:45			59.32	
1634:45			59.34	
1635:15		59.78	59.36	
1635:50			59.34	
1636:40			59.34	
1637:15			59.35	
1637:35		61.04	59.34	
1638:20			59.35	
1638:55			59.37	
1639:25		61.00		
1640:35		60.98	59.36	
1642:45		60.95		
1643:40			59.40	
1646:45		60.90		

DAMES & MOORE

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Job No. Job
Client Subject
Chk'd. Date

AT	RT	6" WELL	2" WELL	FLOW
1647:55			59.41	
1649:30			59.38	
1651:20		~~61.6~~	59.40	
1652:50		60.66		
1653:20			59.46	
1656:15		60.72		
1657:25			59.38	
1658:50		60.71	59.42	
1701:00		60.68	59.52	
1710:00		60.57	59.50	
1720:00		60.46	59.60	
1730:00		60.35	59.63	
1740:00		60.25	59.68	
1750:00		60.16	59.73	
1800:00		60.07	59.84	
1820:00		59.91	59.85	
1840:00		59.77	59.90	
1900:00		59.63	60.10	
1930:00		59.45	60.08	
2000:00		59.30	60.09	
2030:00		59.16	60.04	
2300:00		58.77	60.04	
11/8 0800:00		58.21	60.75	11/8/96 FRIDAY.

EW-9	40.05
EW-2	74.54
EW-10	64.02
EW-7	57.08
EW-8	42.42

DAMES & MOORE

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Job No. 33178-002-192 Job
Client Subject

TRY 1/4 of gal/min

ACTUAL TIME	RUNNING TIME	6" WELL	2" WELL	FLOW RATE	START @ FLOWMETER: 18.7 gals
1001:30		58.23	FLOW DOWN		
1003:00	0.0				START OF TEST
1003:45	0.75	60.28	2.05	49 psi	
1004:30	1.50	60.25	2.02	"	
1005:00	2.0	60.20	1.97	48	
:25	2.25	60.20	1.97		
:45	2.75	60.20	1.97	0.1 gal in 1.5 min	
1006:00	3.0	60.17	1.94		
:45	3.75	60.15	1.92		
1007:00	4.0	60.15	1.92		
1007:45	4.75	60.17	1.94	0.1 gal in 42 sec	
1008:00	5.0	60.17	1.94		
:15	5.25	60.17	1.94		
:40	5.67	60.17	1.94	49 psi	
1009:00	6.0	60.19	1.96	0.1 gal in 36 sec	
:15	6.25	60.20	1.97		
:30	6.5	60.22	1.99		
:45	6.75	60.24	2.01		
1010:00	7.0	60.25	2.02		
:20	7.33	60.27	2.04		
:40	7.67	60.29	2.06		
:55	7.92	60.31	2.08		
1011:12	8.20	60.33	2.10		
:40	8.67	60.35	2.12		
1012:15	9.25	60.38	2.15	49 psi	
1013:00	10.0	60.43	2.20	0.11 gpm	
:30	10.5	60.46	2.23		
1014:00	11.0	60.49	2.26		
:30	11.5	60.51	2.28		
1015:00	12.0	60.54	2.31		
:30	12.5	60.57	2.34		
1016:00	13.0	60.60	2.37		
:30	13.5	60.63	2.40		
1017:00	14.0	60.65	2.42		

DAMES & MOORE

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Job No. Job
Client Subject

ACTUAL TIME	RUNNING TIME	6" WELL	2" WELL	FLOW RATE	
1017:30	14.5	60.68	2.45		
1018:00	15.0	60.71	2.48		
:30	15.5	60.74	2.51 60.62		
1019:00	16.0	60.77	2.54		
:30	16.5	60.79	2.56		
1020:00	17.0	60.81	2.58		
:30	17.5	60.84	2.61		
1021:00	18	60.87	2.64		
:30	18.5	60.90	2.67	0.1 gpm	
1022:00	19	60.92	2.69		
:30	19.5	60.95	2.72		
1023:00	20	60.97	2.74 60.51		
:30	20.5	61.00	2.77		
1024:00	21	61.02	2.79		
:30	21.5	61.05	2.82		
1025:00	22	61.07	2.84		
:30	22.5	61.10	2.87		
1026:00	23	61.20	2.97		* collected sample for pH measurement
:30	23.5	61.22	2.99		
1027:00	24	61.23	3.00		
:30	24.5	61.25	3.02		
1028:00	25	61.27	3.04		
:30	25.5	61.28	3.05		
1029:00	26	61.30	3.07 60.40		
:30	26.5	61.32	3.09		
1030:00	27	61.34	3.11		
1031:00	28	61.38	3.15		
1032:00	29	61.42	3.19		
1033:00	30	61.46	3.23 60.36		
1034:00	31	61.50	3.27		
1035:00	32	61.54	3.31		
1036:00	33	61.59	3.36		
1037:00	34	61.62	3.39		
1038:00	35	61.66	3.43		

DAMES & MOORE

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ACTUAL TIME	RUNNING TIME	6" WELL	2" WELL	FLOW RATE	
					pH: 7.40
1039:00	36.	61.70	3.47		4.6 °C
1040:00	37.	61.74	3.51		conductivity: 11.03 mS
1041:00	38.	61.79	3.56		
1043:00	40.	61.88	3.65		
1044:00	41.0	61.91	3.68		
1045:06	42.0	61.95	3.72	~0.08 gpm	48 psi
1047:00	43.0	62.04	3.81 / 60.26		
1049:00	45.0	62.14	3.91		
1051:00	47.0	62.23	4.00		
1053:00	49.	62.33	4.10 / 60.21		
1054:00	51.	62.44	4.21		
1057:00	53.	62.54	4.31		
1059:00	55.	62.64	4.41		
1101:00	57.	62.74	4.51		
1103:00	59.	62.85	4.62		
1105:00	61.	62.96	4.73 / 60.19		
1107:00	63.	63.03	4.80		47 psi
1110:00	66.	63.16	4.93 / 60.19		
1113:00	69.	63.29	5.06		
1116:00	72.	63.40	5.17		
1119:00	75.	63.52	5.29 / 60.19		
1122:00	78.	63.64	5.41		46 psi
1127:00	82.	63.81	5.58 / 60.22		
1132:00	87.	63.98	5.75		
1137:00	92.	64.17	5.94 / 60.23		
1142:00	97.	64.38	6.15 / 60.31		
1149:00	102.	64.60	6.37		45 psi
1152:00	107.	64.83	6.60		
1157:00	112.	65.02	6.79		
1202:00	117.	65.43	7.20		44 psi
1204:00	119.	65.47	7.24		
1205:30	120.5				Pump off

DAMES & MOORE

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ACTUAL TIME	RUNNING TIME	6" WELL	2" WELL	FLOW RATE	*RECOVERY*
1206:00	121.	63.18	4.95		Pipe draining back into well
6:15	121.25	63.05	4.82		
:45	121.75	62.91	4.68		Final Flow Meter Reading: 28.25 gpm
1207:00	122	62.88	4.65		
:15	122.25	62.85	4.62		
:30	122.5	62.80	4.57		
:45	122.75	62.79	4.56		
1208:00	123	62.77	4.54		
1208:30	123.5	62.76	4.53		
1209:00	124	62.77	4.54		
:30	124.5	62.78	4.55		
1210:00	125	62.79	4.56		
:30	125.5	62.80	4.51	60.42	
1211:00	126	62.80	4.57		
:30	126.5	62.81	4.58		
1212:00	127	62.81	4.58		
1213:00	128	62.82	4.59		
1214:00	129	62.82	4.59		
1215:00	130	62.83	4.60		
1216:00	131	62.84	4.61	60.43	Reset HERMIT for recovery data collection @ 1217:00.
1218:00	133	62.85	4.62		
1220:00	135	62.86	4.63		
1222:00	137	62.86	4.63		
1224:00	139	62.87	4.64	60.43	
1227:00	142	62.87	4.64		
1230:00	145	62.88	4.65		
1235:00	150	62.89	4.66		
1240:00	155	62.87	4.64	60.42	
1245:00	160	62.81	4.58	60.40	
1248:00	163	62.78	4.55	60.42	
1250:00	165	62.76	4.53	60.42	
1255:00	170	62.69	4.46	60.42	
1300:00	175	62.63	4.40	60.42	
1305:00	180	62.57	4.34	60.41	

DAMES & MOORE

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ACTUAL TIME	RUNNING TIME	6" WELL	2" WELL	FLOW RATE
1310:00	185	62.50	60.44	
1320:00	195	62.39	60.42	
1330:00	205	62.28	60.46	
1340:00	215	62.17	60.52	
1350:00	225	62.03	60.46	
1400:00	235	61.99	60.46	
1410:00	245	61.91	60.48	
1430:00	265	61.74	60.46	
1450:00	285	61.59	60.56	
1510:00		61.43	60.50	
1710:00		60.75	60.82	

APPENDIX C
MANUFACTURER'S LITERATURE

[redacted]E ANCHOR PUMPS

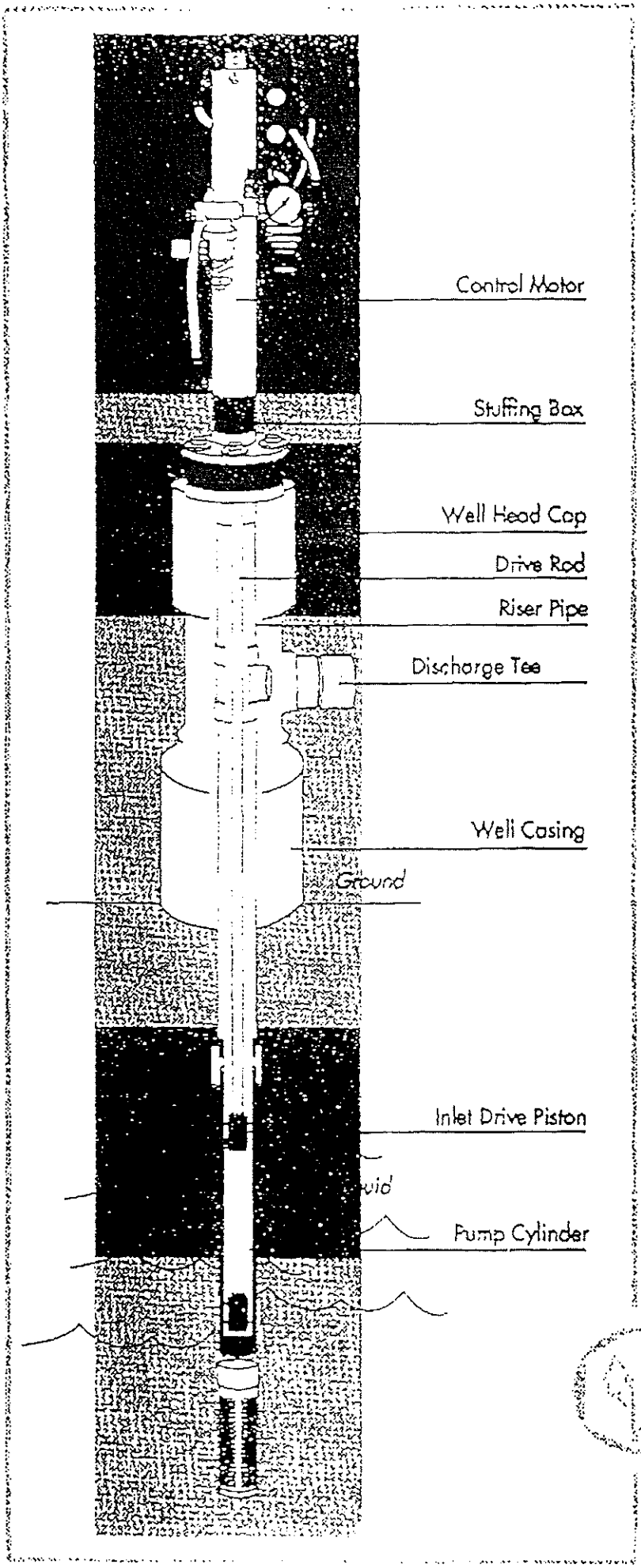
The Blackhawk Anchor Pump is a positive displacement piston pump. It is surface driven, with either an air pneumatic or electric top head drive motor. It is made of a stainless steel cylinder, self cleaning check-ball assemblies, and a fiberglass sucker drive rod. The Anchor Pump is made to be a simple pump for difficult applications.

The Anchor Pump drive head assembly is situated above the well. It is connected to the cylinder by means of the riser eduction pipe. The up and down motion of the surface drive motor is transferred to the fiberglass drive rod, which is attached to the inlet drive piston. This motion presses and lifts the liquid being pumped past the bottom intake of the foot valve into the cylinder pump assembly lifting the pumped liquid to surface for discharge.

The Anchor Pump is designed for shallow or deep well recovery. The Anchor Pump can operate at vertical or horizontal well angles. The pump can run wet or dry and pulls down liquid to zero submergence. The self cleaning piston drive assembly resist malfunction due to dissolved mineral encrustation, and biological slime.

There are Three Anchor Pump Models

	Minimum Well I.D.	Flow Performance
• *Model 101*	2" diameter	0 – 2 GPM
• *Model 102*	3" diameter	0 – 6 GPM
• *Model 103*	4" diameter	0 –14 GPM


Control Motor
Stuffing Box
Well Head Cap
Drive Rod
Riser Pipe
Discharge Tee
Well Casing
Ground
Inlet Drive Piston
Pump Cylinder

[redacted]PICAL SPECIFICATION FOR ANCHOR PUMP 101

1.0 Scope

1.1 The pump shall be designed for wet or dry operation.
1.2 The pump shall be able to pump .05 gpm per stroke at 0 submergence.
1.3 The pump shall be driven by a top head drive motor at surface grade.
1.4 The pump shall be Blackhawk Anchor pump model 101 or equal.

2.0 System Capacity and Air or Electric Motor Requirements

2.1 The pump shall have the capacity of 2 US GPM when operating at 0 submergence.
2.2 The air motor shall be rated for 120 psi., 40 Strokes per min.

3.0 Pump Design and Materials of Construction

3.1 There shall be a continuous fiberglass sucker rod assembly to drive the pump.
3.2 The pump cylinder, piston, rod connectors, screen shall be stainless steel.
3.3 The piston shall have Nitril seals to resist chemical degradation.
3.4 The foot valve and piston shall be interchangeable for easy field service.
3.5 A screen shall be included as part of the suction inlet assembly.
3.6 A stuffing box with Nitril seals shall be used at surface grade to prevent liquid from exerting the drive motor assembly.
3.7 Name plate shall be affixed to the pump head. The pump model shall be noted on nameplate.

4.0 Air Drive Motor Design

4.1 The motor shall be a of a air cylinder design.
4.2 The motor shall be able to work with inlet pressure ranging from 30 to 120 psi.
4.3 No air from pump motor shall be introduced down the well or come in contact with the liquid being pumped.
4.4 The motor shall have a stuffing box at the drive shaft.

5.5 Environmental Requirements

5.1 The pump drive motor at surface grade shall be enclosed in a PVC shroud enclosure suitable for outdoor installations.

[redacted]CHNICAL DATA

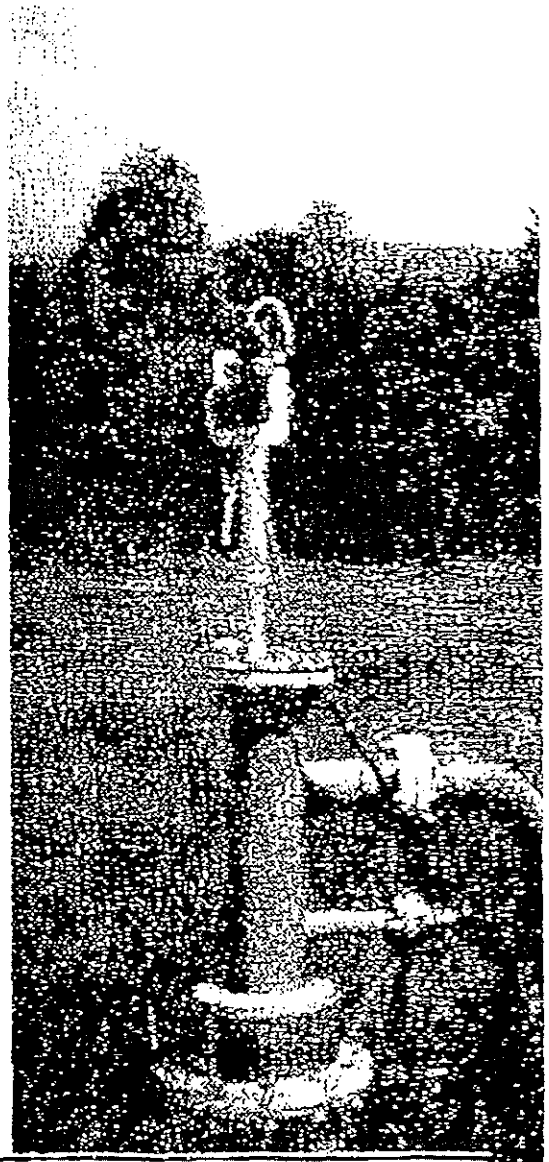
Anchor Pump 101

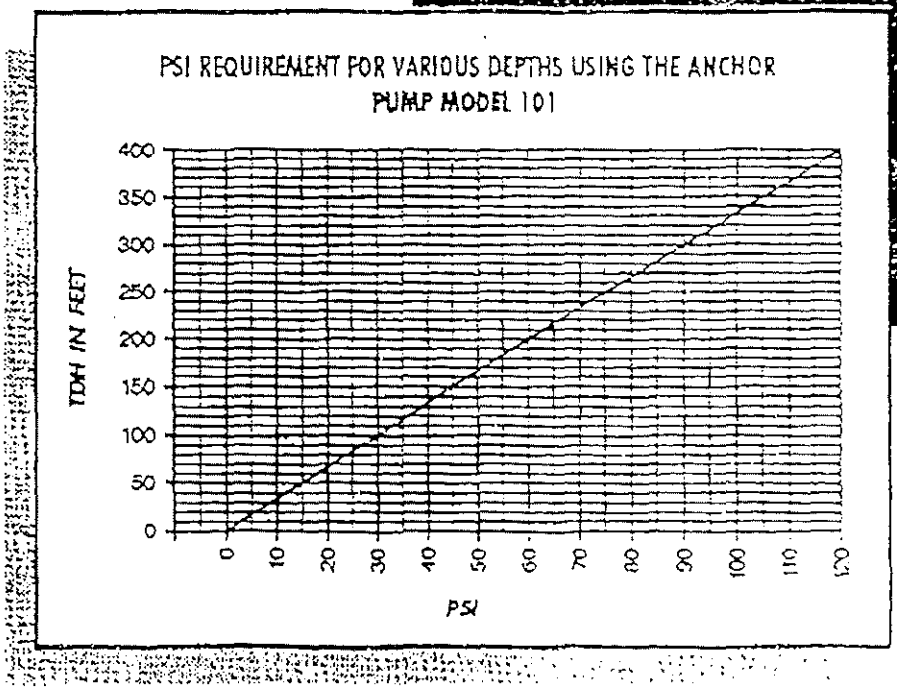
Flow Range: 0 to 2 US GPM
Discharge Per Stroke: .05 US GPM
Motors: Anchor Air Pneumatic Motor Standard
Stroke Length: 12"
Maximum Operating Pressure: 120 PSI
Maximum Strokes Per Minute: 40
Variable Speed (Stroke) Control
Overall Length: 18"
MAX DIA.: 8"

Discharge Size: 1 1/4" NPT
Pump End Construction Material: Stainless Steel, Nitril, Fiberglass, PVC.
Installation: Unit can be installed vertically or horizontally
Pump Cylinder Length: 24"
Riser Pipe: 1 1/4"
Sucker Drive Rod Connection: 7/16 - 20 thread
Operational Depth: 500'

Net Weight Air Motor System: 17 LBS.*
Ship Weight: 18 LBS.

* For 10' complete system. Additional 10' Lengths Riser Pipe & Drive Rod: 5 LBS.





PUMP SELECTION

Well Submittal Data

1. *Well Construction*

Casing size	_____
Casing material	_____
Riser pipe size	_____
Riser pipe material	_____
Well Depth	_____
Well completion: Gravel Pack	_____
Screen	_____
Slotted	_____
Open hole	_____
Other	_____
Desired Pump Setting Depth	_____

2. *Pumping Conditions*

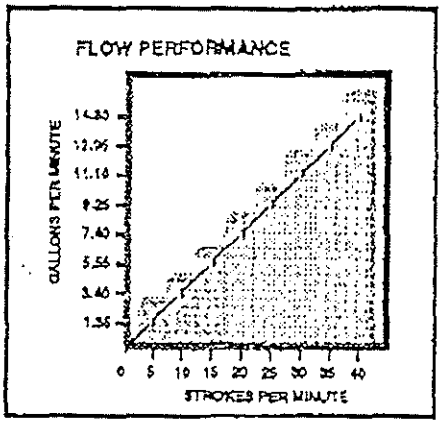
Desired pumping rate	_____ gpm
Continous ____ , or intermittent ____	
Well head discharge pressure required	_____ psi
Total dynamic head (TDH)	_____ ft.
Static fluid level	_____
Expected dynamic fluid level	_____
Down hole temperature	_____ F.

3. *Well Fluid*

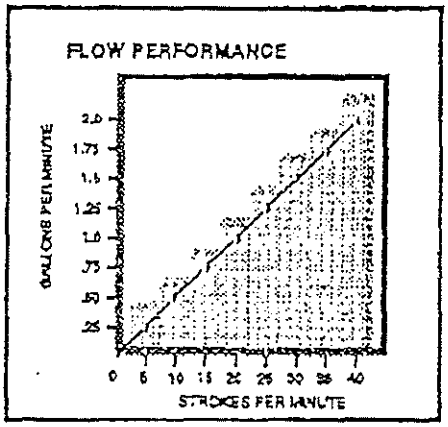
Avg. specific gravity	_____
Viscosity	_____
Chemical compostition: Water %	_____
	_____
	_____
	_____
Solids content % by volume: none	_____
clay	_____
sand	_____
silt	_____
other	_____

4. *Power Supply*

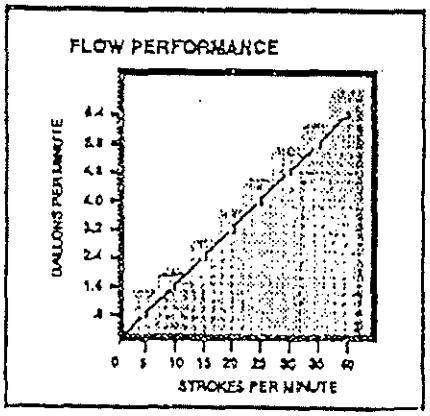
Air Supply pressure at well	_____ psi
Electric supply Voltage	_____
Phase	_____



Anchor Pump 101



Anchor Pump 103



Anchor Pump 102

BLACKHAWK
ENVIRONMENTAL COMPANY

SPECIFICATIONS FOR THE ELECTRIC ANCHOR PUMP MODEL 102E

The pumping system shall be powered by electricity. The control motor shall be located at surface grade. The pump will be capable of removing water and product(e.g. oil, solvents, leachate) from a well casing of three (3) inch diameter or greater to depths of 100 feet. The fluid inlet shall be located at the bottom of the pump intake cylinder and be capable of removing water or product to 0 submergence depth.

PUMP

The pump have the pump motor and controls at surface grade. There shall be no timers, bubblers or air valves external to the pump needed to operate the pump. The pump shall not introduce any electrical power into the well. The pump shall be powered from grade by a fiberglass sucker-rod assembly. Product shall be discharged through the 2" eductor pipe. The sucker-rod and pump assembly shall be capable of being removed through the open throat of the 2" eductor pipe at grade for easy field service.

The pump shall be able to pump 6 gpm using at 0 submergence to a depth of 100 feet. 230 Volt 3 Phase must be used to power the pump motor. Power to the pump shall be direct from grade through the sucker-rod assembly.

Standard materials of construction shall be stainless steel, viton, and PVC

PUMP MOTOR DESCRIPTION

1. The pump motor shall be located at grade on top of the well head assembly.
2. The pump motor assembly shall need one electrical input.
3. No air or electricity shall be introduced down the well.
4. No air or electricity shall come in contact with the liquid to be pumped.

PUMP INTERNALS

1. The fluid discharge pipe(eductor pipe) of the pump can be PVC, HDPE, or steel.
2. The discharge pipe of the pump shall serve as the tension member between the top and bottom of the pump.
3. The sucker-rod assembly shall be fiberglass, stainless steel, and viton.
4. The pump shall supply a volume of at least .16 gallons per stroke at 0 submergence head.

PUMP ASSEMBLY

1. The pump cylinder shall be stainless steel and 24" x 2".
2. The bottom foot valve and sucker-rod piston valve shall be interchangeable for easy service.
3. The foot valve and sucker-rod piston valve shall be a free floating, self cleaning, ball check valve.

FLOW RATE

The pump shall be able to remove at least 6 gpm at 100 feet of depth.

21W159 HILL AVE. GLEN ELLYN, IL 60137
PHONE (630) 469-4916 FAX (630) 469-4896

BLACKHAWK
ENVIRONMENTAL COMPANY

ANCHOR PISTON PUMP

A simple pump for difficult applications

The Blackhawk Anchor Pump uses a stainless steel cylinder, self cleaning check-ball assemblies, and a fiberglass sucker-rod assembly. These three parts are the basic components of the Anchor Pump.

The pump is made to be a simple pump for difficult applications.

The pump head assembly is situated above the well. It is connected to the cylinder by means of the riser pipe. The up and down stroke movement of the fiberglass sucker-rod assembly is transmitted down the rise pipe to the stainless steel check ball piston which presses the water in the riser pipe up to the surface.

A stainless steel foot valve is incorporated into the cylinder. Fabricated stainless steel components ensure high reliability, efficiency, and long trouble free life.

The Anchor pump has been field tested in the most difficult landfill leachate, and groundwater recovery wells through winter and summer seasons.

The Anchor pump is easy to install and is designed for in field service.

The Blackhawk Environmental Company offers an optional service which includes field training of customer personnel for installation maintenance and repair.

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BLACKHAWK
ENVIRONMENTAL COMPANY

TECHNICAL DATA

Stroke length	12"
Maximum external diameter	2 1/2"
Total cylinder length	24"
Connection of riser pipe	2"
Connection to sucker rod	7/16" - 20
Recommended internal diameter of bore hole	3-4" Dia
Weight of cylinder	5 Lbs.

PERFORMANCE (When using Blackhawk Environmental Company motor)

Operational depth.	100' Maximum(based on standard motor)
Stroke length	12"
Strokes per minute	5 - 40
Discharge per stroke*	.16 gal. per stroke

*Note flow does not vary with depth.

MATERIALS

The Blackhawk Anchor Pump is manufactured from stainless steel, viton, and teflon

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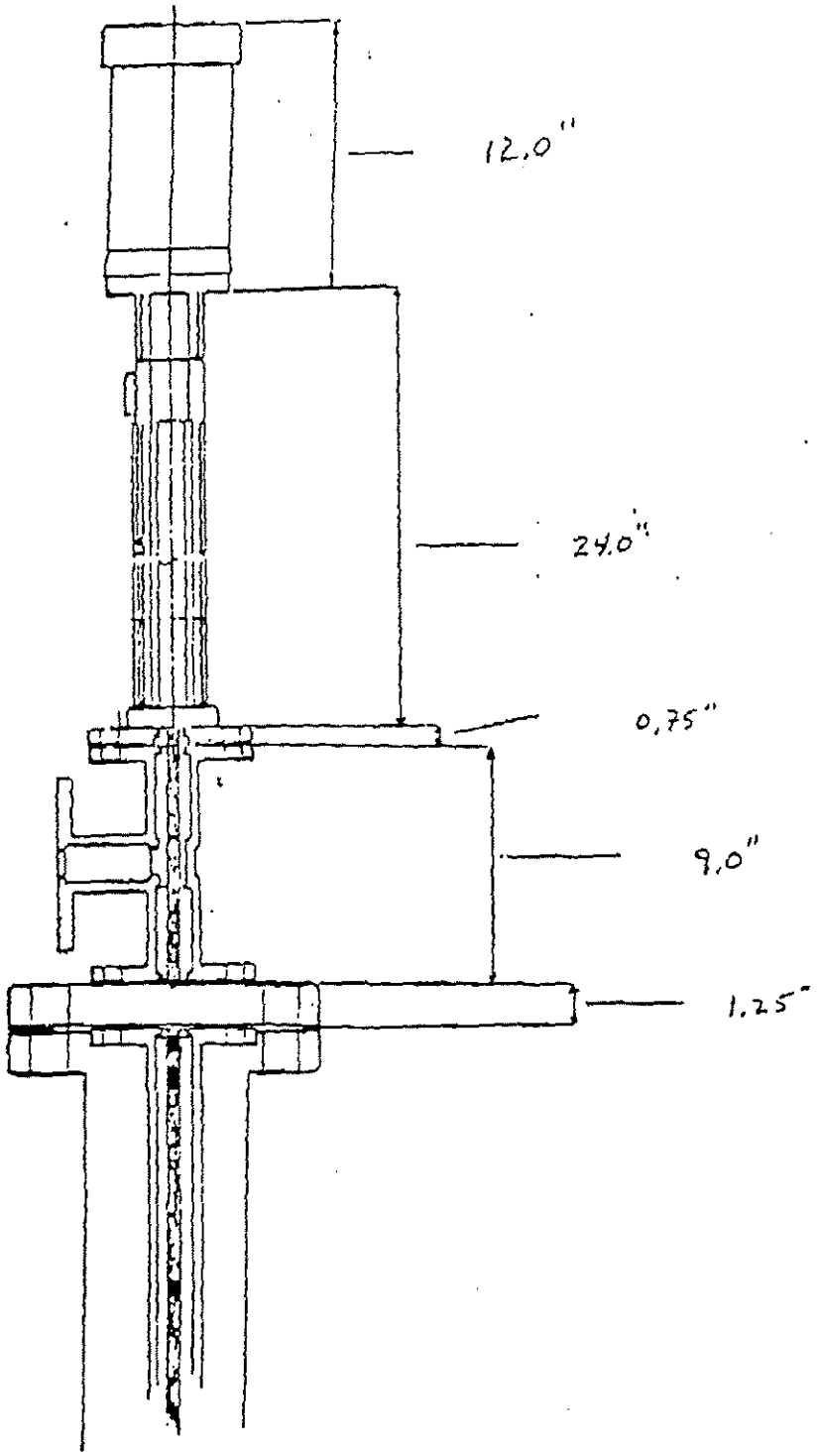
BLACKHAWK
ENVIRONMENTAL COMPANY

Anchor Pump Electric Actuator



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PHONE: (630) 469-4916 FAX: (630) 469-4896

GRAINGER MOTOR INFORMATION (ACTF)

Grainger Model No. : 3N857

Mfr. Model No. : 3N857
Mfr. Catalog No. : 610651
Brand Name : Dayton

Motor Type : 3-Phase Motors
HP : 1/3
RPM : 1725&1425
AC Volts : 230/460
Hertz : 60&50
NEMA Frame : 56C
Phase : 3 Ph
Enclosure : Haz-TEFC
Mounting Type : C-Face
Max. Ambient : 40 C
Service Factor : 1.00
Rotation (View From Shaft End) : CW/CCW
Thermal Protection : Auto
Insulation Class : B
Nominal Efficiency : 68.0
Winding Type (3-Phase) : Wye
Locked Rotor KVA Code : K
Full Load Amps : 1.5/0.75
Service Factor Amps : 1.5/0.75
Locked Rotor/Starting Amps : 8.9 @ 230V
Full-Load Torque : 12.2 LBIN
Breakdown Torque : 48.7 LBIN
Locked Rotor Torque : 42.4 LBIN

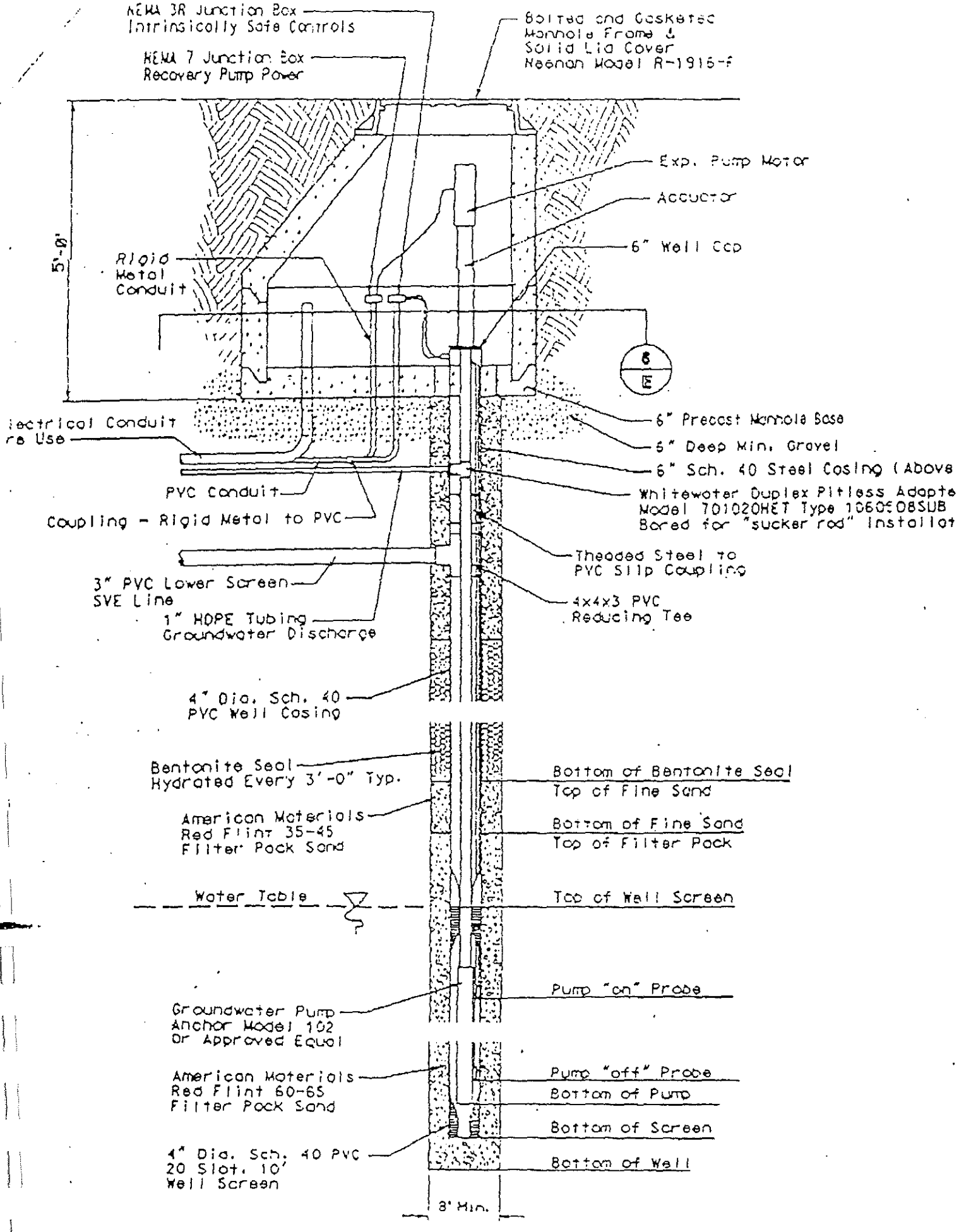
Frame Construction : RS
End Shield Construction : AL
Winding Materials : Start - N/A Run - C

Bearing Type : Shaft End : Ball-DS Lead End : Ball-DS

Output Shaft : Diameter : 5/8 / N/A
Length : 1 7/8 / N/A
Type : Key / N/A

Resilient Rings OC : N/A
Overall Height : 6 13/16
Length Less Shaft : 10 5/8
Body Diameter : 5.3

FEATURES1 C-Face, no base. Meets NEC hazardous atmosphere Class 1, Group D and
FEATURES2 Class 2, Groups E, F and G.


NEMA 3R Junction Box
Intrinsically Safe Controls
NEMA 7 Junction Box
Recovery Pump Power
Bolted and Gasketed
Manhole Frame &
Solid Lid Cover
Neenah Model R-1916-F
Exp. Pump Motor
Accuator
6" Well Cap
5'-0"
Rigid
Metal
Conduit
6
E
lectrical Conduit
re Use
6" Precast Manhole Base
6" Deep Min. Gravel
6" Sch. 40 Steel Casing (Above
PVC Conduit
Whitewater Duplex Pitless Adapte
Model 701020HET Type 1060E08SUB
Bored for "sucker rod" Installat
Coupling - Rigid Metal to PVC
Threaded Steel to
PVC Slip Coupling
3" PVC Lower Screen
SVE Line
4x4x3 PVC
Reducing Tee
1" HDPE Tubing
Groundwater Discharge
4" Dia. Sch. 40
PVC Well Casing
Bentonite Seal
Hydrated Every 3'-0" Typ.
Bottom of Bentonite Seal
Top of Fine Sand
American Materials
Red Flint 35-45
Filter Pack Sand
Bottom of Fine Sand
Top of Filter Pack
Water Table
Top of Well Screen
Pump "on" Probe
Groundwater Pump
Anchor Model 102
Or Approved Equal
American Materials
Red Flint 60-65
Filter Pack Sand
Pump "off" Probe
Bottom of Pump
Bottom of Screen
4" Dia. Sch. 40 PVC
20 Slot, 10'
Well Screen
Bottom of Well
3' Min.

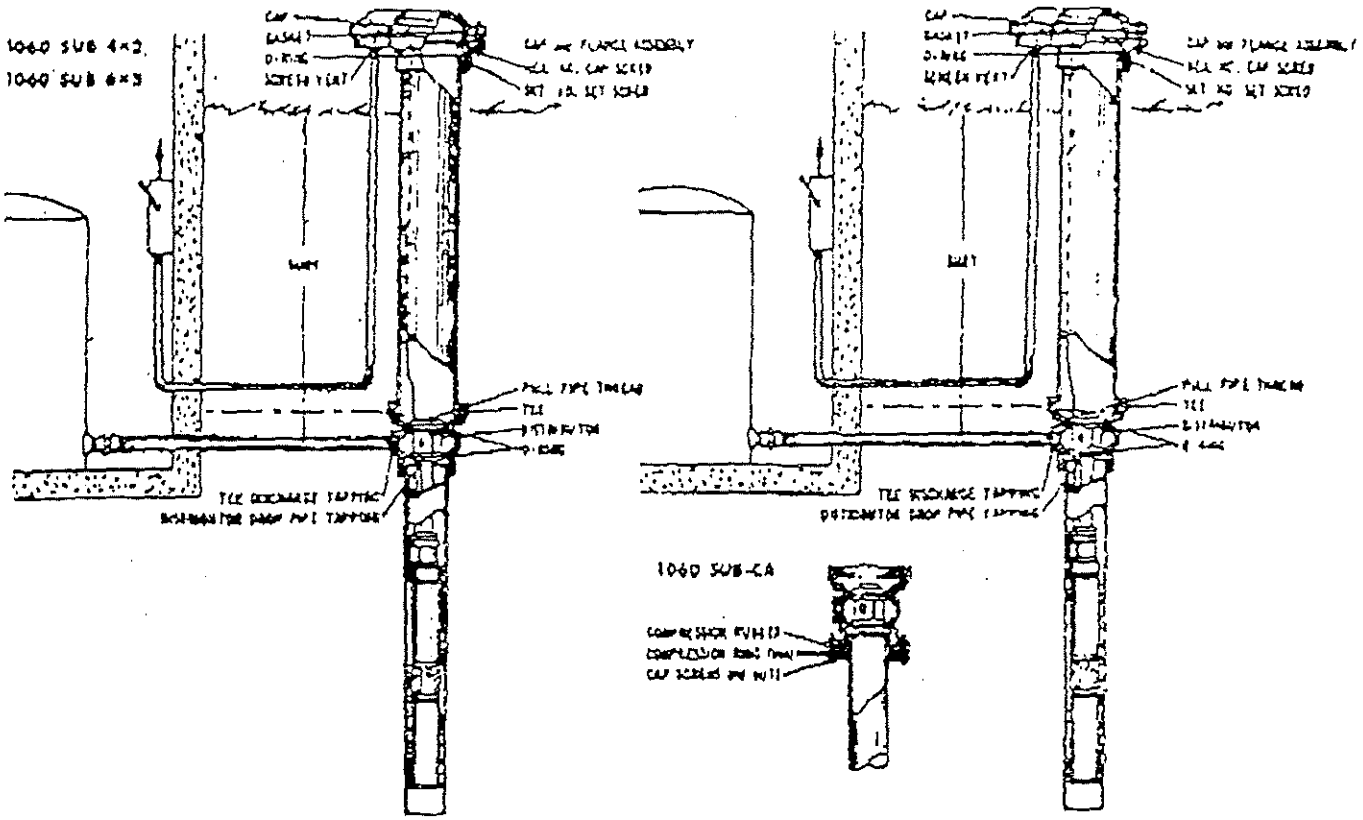
MODEL 701010 - TYPE 1060 SUB 4X2 & 1060 SUB 6X3

MODEL 701010 - TYPE 1060 SUB & 1060 SUB CA

Duplex Pitless

Underground Discharge Unit

for use with SUBMERSIBLE PUMPS



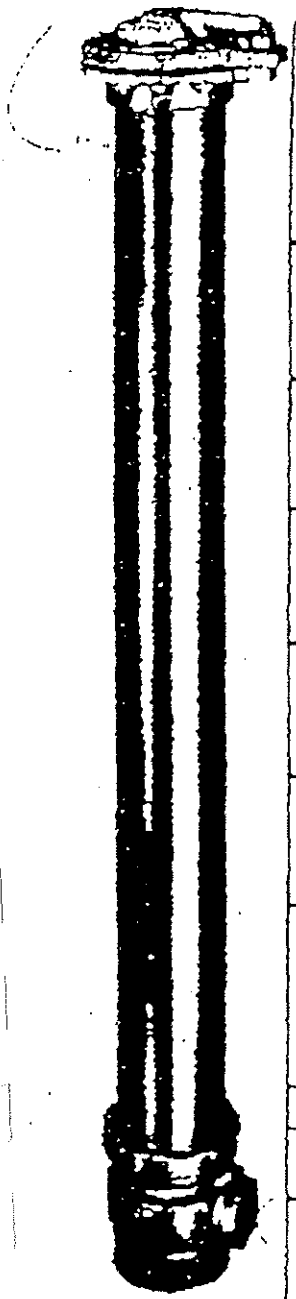
ADAPTER TYPE	1060 SUB 4	1060 SUB 5	1060 SUB 6	1060 SUB 4CA	1060 SUB 5CA	1060 SUB 6CA	1060 SUB 4x2	1060 SUB 6x3
MODEL NUMBER	701010 HCT	701010 JET	701010 KET	701010 HCC	701010 JEC	701010 KEC	701020 HET	701020 KFT
DESCRIPTION								
Cap & Flange Assembly	150354	150358	150356	150354	150358	150356	150354	150358
Cap	150042	150062	150062	150042	150062	150062	150042	150062
Gasket	150041	150061	150061	150041	150061	150061	150041	150061
Flange	150039	150059	150079	150059	150059	150079	150039	150079
Screen Vent	150022	150022	150022	150022	150022	150022	150022	150022
Set Screw 3/8" x 5/8" (3 Req'd.)	150019	150019	150019	150019	150019	150019	150019	150019
Hex Hd. Cap Screw 3/8" x 2" (6 Req'd.)	121111	121111	121111	121111	121111	121111	121111	121111
Nut 3/8" (6 Required)	120760	120760	120760	120760	120760	120760	120760	120760
O - Ring (Flange)	150040	150060	150080	150040	150060	150080	150040	150080
Tee	150024	150044	150064	150065	150090	150094	150192	150622
Distributor	150026	150046	150066	150026	150046	150066	150190	150104
O - Ring (Distributor) (2 Required)	150027	150047	150067	150027	150047	150067	150027	150067
Plug 1 1/4" N.P.T.		120838	120838		120838	120838		
Combination Rubber				150087	150091	150095		
Compression Ring (Iron)				150088	150092	150096		
Hex Hd. Cap Screw 1/2" x 2 1/2"				121123(4)	121123(6)			
Nut 1/2"				120782(4)	120762(6)			
Hex Hd. Cap Screw 1/2" x 1 3/4"						121120(6)		

MODEL 701020 - TYPE 1060 SUB 4x2 & 1060 SUB 8x3
MODEL 701010 - TYPE 1060 SUB & 1060 SUB CA

Duplex Pitless

Underground Discharge Unit
for use with SUBMERSIBLE PUMPS

A Duplex Pitless Unit offers approved, sanitary, frostproof protection of the underground discharge line from a water well and still allows the convenience of pulling internal well parts without disturbing underground connections. A model of the same diameter as the well, or larger, should be used so as not to restrict the well opening. Meets standards established by United States Public Health Service as well as standards established by state Boards of Health. *



ORDER BY UNIT NUMBER, NAME AND BURY LENGTH

Model Number	Adapter Type	Well Size	Tee Discb. Tapping	Dirc. Drop Pipe Tapping	Pull Pipe Thread	Bury Length	Approximate Weight
701010 HCT	1060 SUB 4	4"	1 ¼	1 ¼	1	3 ft.	110
						4 ft.	120
Tapped for attachment to 4" standard pipe well casing.						5 ft.	140
						6 ft.	155
						7 ft.	170
701010 JAT	1060 SUB 6	5"	2	2	1 ¼	3 ft.	139
						4 ft.	158
Tapped for attachment to 5" standard pipe well casing.						5 ft.	177
						6 ft.	196
						7 ft.	215
701010 KET	1060 SUB 6	6"	2	2	1 ¼	3 ft.	159
						4 ft.	177
Tapped for attachment to 6" standard pipe well casing.						5 ft.	195
						6 ft.	213
						7 ft.	231
701010 HCC	1060 SUB 4CA	4"	1 ¼	1 ¼	1	3 ft.	120
						4 ft.	135
* Compression type adapter unit for attachment to 4" standard pipe casing.						5 ft.	160
						6 ft.	185
						7 ft.	180
701010 JEC	1060 SUB 5CA	5"	2	2	1 ¼	3 ft.	160
						4 ft.	183
* Compression type adapter unit for attachment to 5" standard pipe casing.						5 ft.	185
						6 ft.	207
						7 ft.	226
701010 KEC	1060 SUB 6CA	6"	2	2	1 ¼	3 ft.	172
						4 ft.	190
* Compression type adapter unit for attachment to 6" standard pipe casing.						5 ft.	208
						6 ft.	226
						7 ft.	244

for use with HIGH CAPACITY SUBMERSIBLE PUMPS

The 1060 SUB 4x2 models for 4" wells make provision for 2" water delivery pipes which have a capacity of 1.9 times that of 1¼" pipes.

The 1060 SUB 6x3 models for 6" wells make provision for 3" water delivery pipes which have a capacity of 2.7 times that of 2" pipes.

ORDER BY UNIT NUMBER, NAME, AND BURY LENGTH

Model Number	Adapter Type	Well Size	Tee Discb. Tapping	Dirc. Drop Pipe Tapping	Pull Pipe Thread	Bury Length	Approximate Weight
701020 HET	1060 SUB 4x2	4"	2	2	1 ¼	3 ft.	108 lbs.
						4 ft.	133 lbs.
Tapped for attachment to 4" standard pipe well casing.						5 ft.	138 lbs.
						6 ft.	163 lbs.
						7 ft.	168 lbs.
701020 KFT	1060 SUB 6x3	6"	3	3	1 ¼	3 ft.	164 lbs.
						4 ft.	184 lbs.
Tapped for attachment to 6" standard pipe well casing.						5 ft.	202 lbs.
						6 ft.	220 lbs.
						7 ft.	238 lbs.

Whitewater Mfg. Co. Whitewater, Wisconsin 53190 414 473 2400

APPENDIX D
REMEDIAL ACTION COST EVALUATION

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

Our Previous Capital Cost Estimates - Remediation of Drinking Water Supplies				
Installation of JL-100 GAC Filter Systems	71	EA	$1,054	$74,800
Installation of JL-300 GAC Filter Systems	21	EA	$1,752	$36,800
Pipe Installation	92	L.F.	$286	$26,300
Installation of WDNR Approved Pre-Filters	92	EA	$139	$12,800
Contingencies (25%)				$37,700
			Subtotal:	$188,400
			Average:	$2,047.83

Projected Increase in Capital Costs

Year	# of Homes	Increase	Average 1995 Installation Cost	Installation Cost	Installation Costs ÷ Engineering Fees
1996	80				
1997	82	2	$2,048	$4,100	$5,300
1998	85	3	$2,048	$6,100	$7,900
1999	87	2	$2,048	$4,100	$5,300
2000	90	3	$2,048	$6,100	$7,900
2001	93	3	$2,048	$6,100	$7,900
2002	96	3	$2,048	$6,100	$7,900
2003	98	2	$2,048	$4,100	$5,300
2004	101	3	$2,048	$6,100	$7,900
2005	105	4	$2,048	$8,200	$10,600
2006 See Note	107	2	$2,048	$4,100	$5,300
2007	110	3	$2,048	$6,100	$7,900
2008	113	3	$2,048	$6,100	$7,900
2009	116	3	$2,048	$6,100	$7,900
2010	119	3	$2,048	$6,100	$7,900
2011	123	4	$2,048	$8,200	$10,600
2012	127	4	$2,048	$8,200	$10,600
2013	131	4	$2,048	$8,200	$10,600
2014	136	5	$2,048	$10,200	$13,200
2015	140	4	$2,048	$8,200	$10,600
2016	145	5	$2,048	$10,200	$13,200
2017	150	5	$2,048	$10,200	$13,200
2018	155	5	$2,048	$10,200	$13,200
2019	160	5	$2,048	$10,200	$13,200
2020	165	5	$2,048	$10,200	$13,200
2021	171	6	$2,048	$12,300	$15,900

Note: Shading indicates the years in which the costs apply; the 10th year costs are "shared" from both Phase I and Phase II.

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

Our Previous Annual Long-Term O&M Cost Estimate				
Maintenance of JL-100 GAC Filter Systems	71	EA	$228	$16,200
Maintenance of JL-300 GAC Filter Systems	21	EA	$442	$9,400
Contingencies (25%)				$6,400
			Annual Subtotal:	$32,000
			Average:	$347.83

Projected Increase in System Maintenance Costs

Year	# of Homes	Increase	Average 1995 O&M Cost	O&M Cost
1996	80			
1997	82	2	$348	$700
1998	85	3	$348	$1,000
1999	87	2	$348	$700
2000	90	3	$348	$1,000
2001	93	3	$348	$1,000
2002	96	3	$348	$1,000
2003	98	2	$348	$700
2004	101	3	$348	$1,000
2005	105	4	$348	$1,400
2006 See Note	107	2	$348	$700
2007	110	3	$348	$1,000
2008	113	3	$348	$1,000
2009	116	3	$348	$1,000
2010	119	3	$348	$1,000
2011	123	4	$348	$1,400
2012	127	4	$348	$1,400
2013	131	4	$348	$1,400
2014	136	5	$348	$1,700
2015	140	4	$348	$1,400
2016	145	5	$348	$1,700
2017	150	5	$348	$1,700
2018	155	5	$348	$1,700
2019	160	5	$348	$1,700
2020	165	5	$348	$1,700
2021	171	6	$348	$2,100

Note: Shading indicates the years in which the costs apply; the 10th year costs are "shared" from both Phase I and Phase II.

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

Our Previous Semi-Annual Well Sampling Cost Estimate				
Personnel Field Time	80	Hrs	$65	$5,200
Personnel Expenses	10	Days	$125	$1,300
Analytical Services	160	Smpls	$150	$24,000
Report Preparation	16	Hrs	$65	$1,000
Clerical & Acctng	8	Hrs	$45	$400
Contingencies (25%)				$8,000
			Annual Subtotal:	$39,900
			Average:	$498.75

Projected Increase in Sampling Costs

Year	# of Homes	Increase	Average 1995 Sampling Cost	Sampling Cost
1996	80			
1997	82	2	$499	$1,000
1998	85	3	$499	$1,500
1999	87	2	$499	$1,000
2000	90	3	$499	$1,500
2001	93	3	$499	$1,500
2002	96	3	$499	$1,500
2003	98	2	$499	$1,000
2004	101	3	$499	$1,500
2005	105	4	$499	$2,000
2006 See Note	107	2	$499	$1,000
2007	110	3	$499	$1,500
2008	113	3	$499	$1,500
2009	116	3	$499	$1,500
2010	119	3	$499	$1,500
2011	123	4	$499	$2,000
2012	127	4	$499	$2,000
2013	131	4	$499	$2,000
2014	136	5	$499	$2,500
2015	140	4	$499	$2,000
2016	145	5	$499	$2,500
2017	150	5	$499	$2,500
2018	155	5	$499	$2,500
2019	160	5	$499	$2,500
2020	165	5	$499	$2,500
2021	171	6	$499	$3,000

Note: Shading indicates the years in which the costs apply; the 10th year costs are "shared" from both Phase I and Phase II.

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

Our Previous Capital Cost Estimates - Remediation of Drinking Water Supplies				
Installation of JL-100 GAC Filter Systems	71	EA	$1,054	$74,800
Installation of JL-300 GAC Filter Systems	21	EA	$1,752	$36,800
Pipe Installation	92	L.F.	$286	$26,300
Installation of WDNR Approved Pre-Filters	92	EA	$139	$12,800
Contingencies (35%)				$52,700
			Subtotal:	$203,400
			Average:	$2,210.87

Projected Increase in Capital Costs

Year		# of Homes	Increase	Average 1995 Installation Cost	Installation Cost	Installation Costs + Engineering Fees
1996		80				
1997		82	2	$2,211	$4,400	$5,700
1998		85	3	$2,211	$6,600	$8,500
1999		87	2	$2,211	$4,400	$5,700
2000		90	3	$2,211	$6,600	$8,500
2001		93	3	$2,211	$6,600	$8,500
2002		96	3	$2,211	$6,600	$8,500
2003		98	2	$2,211	$4,400	$5,700
2004		101	3	$2,211	$6,600	$8,500
2005		105	4	$2,211	$8,800	$11,400
2006	See Note	107	2	$2,211	$4,400	$5,700
2007		110	3	$2,211	$6,600	$8,500
2008		113	3	$2,211	$6,600	$8,500
2009		116	3	$2,211	$6,600	$8,500
2010		119	3	$2,211	$6,600	$8,500
2011		123	4	$2,211	$8,800	$11,400
2012		127	4	$2,211	$8,800	$11,400
2013		131	4	$2,211	$8,800	$11,400
2014		136	5	$2,211	$11,100	$14,300
2015		140	4	$2,211	$8,800	$11,400
2016		145	5	$2,211	$11,100	$14,300
2017		150	5	$2,211	$11,100	$14,300
2018		155	5	$2,211	$11,100	$14,300
2019		160	5	$2,211	$11,100	$14,300
2020		165	5	$2,211	$11,100	$14,300
2021		171	6	$2,211	$13,300	$17,200

Note: Shading indicates the years in which the costs apply; the 10th year costs are "shared" from both Phase I and Phase II.

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

Our Previous Annual Long-Term O&M Cost Estimate			
Maintenance of JL-100 GAC Filter Systems	71 EA	$228	$16,200
Maintenance of JL-300 GAC Filter Systems	21 EA	$442	$9,400
Contingencies (35%)			$9,000
	Annual Subtotal:		$34,600
	Average:		$376.09

Projected Increase in System Maintenance Costs

Year	# of Homes	Increase	Average 1995 O&M Cost	O&M Cost
1996	80			
1997	82	2	$376	$800
1998	85	3	$376	$1,100
1999	87	2	$376	$800
2000	90	3	$376	$1,100
2001	93	3	$376	$1,100
2002	96	3	$376	$1,100
2003	98	2	$376	$800
2004	101	3	$376	$1,100
2005	105	4	$376	$1,500
2006 See Note	107	2	$376	$800
2007	110	3	$376	$1,100
2008	113	3	$376	$1,100
2009	116	3	$376	$1,100
2010	119	3	$376	$1,100
2011	123	4	$376	$1,500
2012	127	4	$376	$1,500
2013	131	4	$376	$1,500
2014	136	5	$376	$1,900
2015	140	4	$376	$1,500
2016	145	5	$376	$1,900
2017	150	5	$376	$1,900
2018	155	5	$376	$1,900
2019	160	5	$376	$1,900
2020	165	5	$376	$1,900
2021	171	6	$376	$2,300

Note: Shading indicates the years in which the costs apply; the 10th year costs are "shared" from both Phase I and Phase II.

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

Our Previous Semi-Annual Well Sampling Cost Estimate				
Personnel Field Time	80	Hrs	$65	$5,200
Personnel Expenses	10	Days	$125	$1,300
Analytical Services	160	Smpls	$150	$24,000
Report Preparation	16	Hrs	$65	$1,000
Clerical & Acctng	8	Hrs	$45	$400
Contingencies (35%)				$11,200
			Annual Subtotal:	$43,100
			Average:	$538.75

Projected Increase in Sampling Costs

Year		# of Homes	Increase	Average 1995 Sampling Cost	Sampling Cost
1996		80			
1997		82	2	$539	$1,100
1998		85	3	$539	$1,600
1999		87	2	$539	$1,100
2000		90	3	$539	$1,600
2001		93	3	$539	$1,600
2002		96	3	$539	$1,600
2003		98	2	$539	$1,100
2004		101	3	$539	$1,600
2005		105	4	$539	$2,200
2006	See Note	107	2	$539	$1,100
2007		110	3	$539	$1,600
2008		113	3	$539	$1,600
2009		116	3	$539	$1,600
2010		119	3	$539	$1,600
2011		123	4	$539	$2,200
2012		127	4	$539	$2,200
2013		131	4	$539	$2,200
2014		136	5	$539	$2,700
2015		140	4	$539	$2,200
2016		145	5	$539	$2,700
2017		150	5	$539	$2,700
2018		155	5	$539	$2,700
2019		160	5	$539	$2,700
2020		165	5	$539	$2,700
2021		171	6	$539	$3,200

Note: Shading indicates the years in which the costs apply; the 10th year costs are "shared" from both Phase I and Phase II.

Former Junker Sanitary Landfill
Remedial Action Cost Evaluation

	O&M	New Install.	Annual Maint.	Annual Sampling	Annual Costs
1	211600	5300	700	1000	218600
2	211600	7900	1000	1500	222000
3	211600	5300	700	1000	218600
4	211600	7900	1000	1500	222000
5	211600	7900	1000	1500	222000
6	211600	7900	1000	1500	222000
7	211600	5300	700	1000	218600
8	211600	7900	1000	1500	222000
9	211600	10600	1400	2000	225600
10	211600	5700	800	1100	219200
11	228500	8500	1100	1600	239700
12	228500	8500	800	1600	239400
13	228500	8500	1100	1600	239700
14	228500	8500	1100	1600	239700
15	228500	11400	1100	2200	243200
16	228500	11400	1100	2200	243200
17	228500	11400	1500	2200	243600
18	228500	14300	1500	2700	247000
19	228500	11400	1500	2200	243600
20	228500	14300	1900	2700	247400
21	228500	14300	1900	2700	247400
22	228500	14300	1900	2700	247400
23	228500	14300	1900	2700	247400
24	228500	14300	1900	2700	247400
25	228500	17200	2300	3200	251200

Former Junker Sanitary Landfill

CAPITAL & OPERATIONS AND MAINTENANCE COSTS (WITH 25% CONTINGENCIES FOR THE FIRST TEN YEARS AND 35% CONTINGENCIES THEREAFTER) DURING THE 25-YEAR LONG-TERM MAINTENANCE PROGRAM

Discount Factor: 2% Discount Over 25 Years

YEAR	Factor	Expenditure	Annual Cost	Discounted Cost
0	0.0000	$75300	0	0
1	0.9901	218600	0	0
2	0.9705	222000	0	0
3	0.9512	218600	0	0
4	0.9324	222000	0	0
5	0.9139	222000	0	0
6	0.8956	222000	0	0
7	0.8781	218600	0	0
8	0.8607	222000	0	0
9	0.8437	225600	0	0
10	0.8270	33300	185900	153734
11	0.8106		239700	194300
12	0.7945		239400	190215
13	0.7788		239700	186682
14	0.7634		239700	182985
15	0.7483		243200	181981
16	0.7335		243200	178671
17	0.7189		243600	175133
18	0.7047		247000	174061
19	0.6907		243600	168265
20	0.6771		247400	167507
21	0.6637		247400	164190
22	0.6505		247400	160939
23	0.6376		247400	157752
24	0.6250		247400	154628
25	0.6126		251200	153894
25-YEAR TOTAL:		$3,000,000		$2,745,000

5% Discount Over 25 Years

Factor	Expenditure	Annual Cost	Discounted Cost
	$75300	0	0
0.9754	218600	0	0
0.9278	222000	0	0
0.8826	218600	0	0
0.8395	222000	0	0
0.7986	222000	0	0
0.7597	222000	0	0
0.7226	218600	0	0
0.6874	222000	0	0
0.6538	225600	0	0
0.6219	33300	185900	115620
0.5916		239700	141811
0.5628		239400	134726
0.5353		239700	128316
0.5092		239700	122058
0.4844		243200	117800
0.4608		243200	112055
0.4383		243600	106765
0.4169		247000	102976
0.3966		243600	96605
0.3772		247400	93327
0.3588		247400	88775
0.3413		247400	84446
0.3247		247400	80327
0.3089		247400	76410
0.2938		251200	73800
	$3,000,000		$1,676,000

Former Junker Sanitary Landfill
CAPITAL & OPERATIONS AND MAINTENANCE COSTS (WITH 25% CONTINGENCIES FOR THE FIRST TEN YEARS AND 35% CONTINGENCIES THEREAFTER) DURING THE 25-YEAR LONG-TERM MAINTENANCE PROGRAM
NO DISCOUNTING

YEAR	Annual Cost
0	975300
1	218600
2	222000
3	218600
4	222000
5	222000
6	222000
7	218600
8	222000
9	225600
10	219200
11	239700
12	239400
13	239700
14	239700
15	243200
16	243200
17	243600
18	247000
19	243600
20	247400
21	247400
22	247400
23	247400
24	247400
25	251200
25-YEAR TOTAL:	$6,853,200