DAMES & MOORE

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CONSTRUCTION DOCUMENTATION REPORT

FORMER JUNKER LANDFILL, TOWN OF HUDSON, WISCONSIN

for

LANDFILL REMEDIATION TRUST

March 19, 1998

25 Kessel Court, Suite 201, Madison, WI 53711

Dames & Moore Project No. 33178-003

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EXECUTIVE SUMMARY

The former Junker Sanitary Landfill began operation in 1972, and functioned as a disposal facility under several different management operations before abandonment in 1987. Consequently, the Wisconsin Department of Natural Resources (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 system because of off-site detections of methane. Installation of a leachate collection system occurred at the same time because of detections of landfill compounds in private wells. 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 monitor 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.

Dames & Moore authored the remedial design/remedial action plan, the design documents and the operation, maintenance and monitoring plan for the former Junker Landfill. Construction at the landfill began in June 1997.

This report documents the activities associated with the installation of the gas migration control and leachate removal systems, beginning with the preconstruction meeting and ending with system startup and initiation of the system monitoring program.

1.0 INTRODUCTION

This construction documentation report for the installation of the remedial system at the former Junker Landfill, Town of Hudson, Wisconsin has been prepared in accordance with chapters NR 516 and 724, Wisconsin Administrative Code. This report includes:

- A description of the completed installation, including any deviations from the design plans and specifications.
- Initial system monitoring data.
- Construction photo log.
- Certification that the installation was carried out in accordance with the specifications.
- Record drawings.

Dames & Moore is the consultant for the project. The Project Managers were David Trainor, P.E., and Julie Hoffman, telephone number (608) 273-2886. The construction contractor was Terra Engineering and Construction of Madison, Wisconsin.

1.1 SITE DESCRIPTION

The site is located on approximately 40 acres in the SE¼ of the SE¼ and the SW¼ of the SE¼ of Section 13, Township 29 North, Range 19 West, St. Croix County, Wisconsin. Municipal and industrial/commercial wastes, and sewage sludge and demolition wastes were disposed in the 15-acre fill area. The wastes were placed in the landfill from north to south, but there is no documentation of placement method.

The site is bordered on the west and south by Alexander Road, on the east by a residential farmstead and on the north by property owned by the Girl Scouts of America (Rolling Ridges Girl Scout Camp). The Chicago and North Western Railroad (Union Pacific) runs parallel to Alexander Road, along the southwest side of the landfill.

The site currently has a Chapter NR 504 cap, an active gas extraction system and a leachate extraction system. There is also a series of gas monitoring probes, groundwater monitoring wells and various monitoring points associated with the gas and leachate extraction systems, as shown on

Figure 1. The leachate extraction system, installed as a dual unit in conjunction with the gas system, was supplemented with three additional leachate pumps and connected to the condensate collection tank as part of the construction activities.

The cap consists of two feet of clay, two and one-half feet of grading material and six inches of topsoil. The permeability of the clay barrier, documented during construction, is less than 1×10^{-8} cm/sec for discrete samples. The landfill site is well vegetated, with surface water runoff directed toward one of two sedimentation ponds adjacent to the landfill.

The gas extraction system consists of 21 gas extraction wells and a blower and flare, which are operated to control methane gas migration from the JSL site while minimizing oxygen intrusion. Gas extraction well GEW-16 currently does not operate, as it is not located in the waste. The extracted gas flows through a header system and is destroyed by a ground flare. Condensate collected from the gas extraction system is stored in a 4,000 gallon holding tank, located at the flare station. Although the gas extraction system is currently operating, landfill gas has been measured in monitoring probes located south-southeast of the property (see Section 5.2).

1.1.1 Geology

The surficial sediments at the JSL site consist of sandy ice-contact stratified drift of Late Wisconsinan Superior Lobe glacial till. Unconsolidated material of glacial origin, primarily sands and gravels, extends from 40 to 100 feet deep below these sediments. The underlying bedrock is the Prairie du Chien Group, a fractured dolomite, which may be up to 300 feet thick. In places, it may be capped by the St. Peter's Sandstone. The surficial sediments are the likely conduit for off-site migration of landfill gases.

1.1.2 Groundwater

Groundwater is used extensively for residential, commercial, industrial and agricultural purposes. Potable water is obtained primarily from the upper portion of the Prairie du Chien formation. Regional groundwater flow in the area of the site is west-northwest toward the St. Croix River. Formation of the SWCA occurred in 1991 with detection of volatile organic contaminants in private groundwater well samples. Carbon filters have been installed in most residences within the SWCA. Residents remain on the bottled water delivery list until the carbon filter is confirmed effective.

1.2 SITE BACKGROUND

Originally a gravel pit, landfill operations initiated in 1972 under Walfred Pilquist. In April 1973, Garry Thompson purchased the landfill and continued its operation. Junker Sanitary Landfill, Inc., leased the landfill in 1977. During operation, the site received municipal solid waste, sewage sludges, demolition and commercial/industrial wastes. Since its closure in 1987, the landfill has been covered, regraded, capped and had an active gas extraction system installed. Approximately 200 cubic feet per second of landfill gas currently is being extracted and flared.

In 1994-1995, Wenck Associates, Inc., performed a remedial investigation/feasibility study (RI/FS) at the JSL site. Data on groundwater and landfill gas migration were collected and an evaluation of remedial options performed. The WDNR approved several options for remediating contaminant conditions caused by releases of the landfill waste. This construction documentation report has been prepared in conjunction with the Record of Decision (ROD) on the site detailing the remedial actions performed.

1.3 SYNOPSIS OF THE REMEDIAL ACTION

Three new gas extraction wells, GEW-19, GEW-20, and GEW-21, were installed during the summer of 1997 at the landfill property. These gas extraction wells will assist with removal of methane and VOCs from the landfill, providing a source control measure necessary to reduce the time required to achieve groundwater standards.

Two of the gas extraction wells, GEW-20 and GEW-21, and the leachate extraction well, LEW-1, installed for a leachate pumping test, have been outfitted with electric piston pumps. Four existing wells in the vicinity of the leachate mound, GEW-7, GEW-8, GEW-9, and GEW-10, have been outfitted with downhole electric submersible pumps. All seven wells are connected to the existing lateral/header system which serves as the transfer pipe to the leachate/condensate tank. GEW-20 and GEW-21 did not have appreciable levels of leachate during drilling. After well installation, approximately one foot of leachate was present in each well. However, the piston pumps have been installed one foot off the bottom of the well, in accordance with manufacturer's recommendations. Therefore, neither GEW-20 nor GEW-21 have operated since installation.

Two areas north of the landfill that contained uncapped waste, 1,211 cubic yards, were excavated and the refuse used as general fill for the subsidence areas on the landfill. The volume of the subsidence areas, approximately 1,100 cubic yards, was determined from survey data. The uncapped excavated waste areas were backfilled with soils from the ditch regrade.

The south perimeter ditch was lined with two feet of clay and regraded to drain toward the western culvert running beneath the site access road or toward the southeast retention pond. One area of the ditch, near the western manhole, contained uncapped waste. This waste was excavated and placed beneath the clay cap in one of the subsidence areas on the landfill.

Finally, the passive vent system was abandoned by capping the passive vents below the clay surface.

1.4 CERTIFICATION

I, David P. Trainor, hereby certify that the construction of the remediation system installed at the Former Junker Landfill, Town of Hudson, Wisconsin, was in accordance with the plans and specifications developed by Dames & Moore for this project. Deviations from the original plans and specifications are detailed in Section 3.0 of this report.

David P. Trainor, P.E.
Project Manager

SEAL

1.5 SUMMARY OF APPLICABLE PUBLIC HEALTH AND ENVIRONMENTAL LAWS

1.5.1 NR 500 and NR 700 Administrative Guidelines

The remedial activities were 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.

1.5.2 NR 140 Groundwater Quality Standards

The closure criteria pertaining to the restoration of groundwater impacts was interpreted for the purpose of this report to be the groundwater quality standards established in Table 1 of Wisconsin Administrative Code Chapter NR 140 (WDNR, 1994). These standards will be applied to the monitor and sentry wells in the groundwater monitoring network.

2.0 PRECONSTRUCTION ACTIVITY SUMMARY

A prebid meeting was held at the former Junker Landfill on May 15, 1997. Present at the meeting were Julie Hoffman, Dave Trainor and Chris Weggemann of Dames & Moore, and representatives from Terra Engineering and Construction (Terra) and Frattalone Excavating and Grading (Frattalone). The project schedule and questions regarding project details were addressed. The agenda for the prebid meeting is located in Appendix A. Bids were submitted by the contractors on May 30, 1997. Terra was the low bidder and was awarded the contract.

A pre-construction meeting was held on June 5, 1997. Present at the meeting were Julie Hoffman and Dave Trainor of Dames & Moore, Scott Zimmerman and Chad Sell of Terra, Wyatt Gutzke of Frattalone, Wendy Anderson and Pat Collins of Wisconsin Department of Natural Resources and Jim Junker of Landfill Remediation Trust. The minutes of the pre-construction meeting and Addenda are located in Appendix A.

3.0 CONSTRUCTION SUMMARY

Construction of the remedial system at Junker Landfill began on Monday, June 23, 1997 and was essentially complete by October 17, 1997. Start up of the treatment system commenced on October 20, 1997. Problems with high oxygen levels in the extracted landfill gas led the operation, maintenance and monitoring contractor, Short, Eliott, and Hendrickson (SEH), to identify a lateral pipe that had separated from the make-shift "tee" in the ditch along Alexander Road. The system was shut down on October 21. Repairs to the treatment system were conducted by Terra on November 4, 1997 and the system was restarted. Oxygen levels at the blower were subsequently measured below one percent.

The landfill extraction system includes three additional gas extraction wells, and leachate pumping capabilities at seven wells within the landfill. Leachate and condensate are collected in an underground leachate storage tank with level detection. Construction as-built plans are located in Appendix G.

3.1 WEEKLY JOB DETAIL

Week 1: June 23- 27, 1997

Julie Hoffman, Dames & Moore, provided construction oversight.
Frattalone conducted work at the site.

June 23, 1997

The subsidence areas are marked to prepare for waste excavation and placement. Pre-construction photographs are taken of the landfill surface and south perimeter ditch.

June 24, 1997

Frattalone surveyed the subsidence areas and perimeter ditch. Began stripping the topsoil from the subsidence areas. SEH shut down the gas extraction system at the end of the day today because the cap will be pulled back.

June 25, 1997

Frattalone finished stripping the topsoil from the subsidence areas.

June 26, 1997

Began stripping buffer soils from the largest subsidence area. Dozer operator encountered the electrical conduit line running from the control panel on the landfill surface to gas extraction well GEW-9. This will have to be repaired. Also, passive vent, PV-4, was located in this subsidence area. Frattalone will cut it off below the clay and cap it.

June 27, 1997

Frattalone finished removing the buffer soils from the subsidence areas today. Will begin pulling back the clay cap on Monday.

Week 2: June 30, 1997 - July 3, 1997

Julie Hoffman, Dames & Moore, provided construction oversight.
Frattalone and Terra conducted work at the site.

June 30, 1997

Heavy rains fell over the weekend and ponded water had to be pumped out of each subsidence area. Removed clay from the two smaller subsidence areas (IB-1/IB-2 and IB-9).

July 1, 1997

Began removal of clay from largest subsidence area (IB-4). The clay in this area contained sand, wood, and 4-6 inch diameter rocks. Segregated this material to use as backfill in the waste excavation area, or as buffer soil above the clay in IB-4. A local farmer mowed the landfill cap today.

July 2, 1997

More rain overnight. Terra's drill crew had problems at a different site, so arrival at the landfill is delayed. Rain continued. Frattalone called off work for the day. Terra drill crew arrived at site at 1300. Prepared equipment for drilling and began drilling GEW-19 at 1400. Drilled to 51.5 feet. The screened interval is 43.5 feet. The borehole is backfilled with gravel up to 7.5 feet below ground surface. The top 7.5 feet of the borehole are backfilled with hydrated bentonite.

July 3, 1997

Drilled GEW-20, setting the well at 64.3 feet. The screened interval is approximately 56.3 feet. The borehole is backfilled with gravel up to seven feet below ground surface. The lateral gas piping running to GEW-10 broke during drilling. This will require repair when the new gas wells are connected to the gas extraction system. Drilled GEW-21, setting the well at 68 feet. The screened interval is approximately 60 feet. The borehole is backfilled with gravel up to 7.5 feet below ground surface. The final 7.5 feet are backfilled with hydrated bentonite.

Week 3: July 7 - 11, 1997

Julie Hoffman, Dames & Moore, provided construction oversight.
Work at the site is conducted by Frattalone.

July 7, 1997

Pumped ponded water out of subsidence areas. Began excavating waste in the area near MW-8. The area south of the access road is capped, including the ditchline. Called work off at 1530 because of heavy rain.

July 8, 1997

Rain yesterday and overnight have made a mess of the landfill surface. Cannot get the off-road trucks up onto the landfill to haul the waste. Will try again tomorrow.

July 9, 1997

Stripped the topsoil from the access road to the top of the landfill. The off-road truck can now shuttle the excavated waste to the subsidence areas. The area nearest IB-1 and IB-2 was being filled with the excavated waste material. Both areas of uncapped waste have been removed. The two excavated areas are surveyed to determine volume of waste. Total waste volume removed was 1211 cubic yards. The uncapped waste areas were backfilled with excess buffer soils from the ditch regrade.

July 10, 1997

Replaced the clay in the subsidence area IB-1/IB-2. During this activity, the lateral pipe for GEW-13 is broken. This will require repair during Terra's activities. GME Consultants are on site at 1000 to do the nuclear density testing. Results at IB-9 subsidence area show about

93% compaction. One Shelby tube and small bag sample are collected for analysis. Buffer soils are replaced in the IB-9 subsidence area. The south perimeter ditch stations are marked along the road side.

July 11, 1997

Arrived at site to find that someone had attempted to break in through the main gate with a vehicle. Reported the incident to the St. Croix County Sheriff. The clay in IB-1/IB-2 subsidence area tested just shy of 90%. Frattalone aerated the clay, then recompacted and sealed at the end of the day. Two Shelby tube samples and small bag samples are collected for analysis.

Week 4: July 14 - 18, 1997

Julie Hoffman and Tammy Verkuilen, Dames & Moore, provided construction oversight. Construction at the site is conducted by Frattalone.

July 14, 1997

The ditch regrade was started by Frattalone. Topsoil is stripped from the ditch and stockpiled on the landfill and used to fill the excavated waste areas. Stopped for the day at ditch station 3+00.

July 15, 1997

Excess buffer soils, removed to regrade the ditch, are placed in the largest subsidence area, IB-4. A laser slope and survey machine is used to guide the ditch regrade. Excavated uncapped waste in the ditch near the western manhole (See Photo #29). The waste is hauled onto the landfill surface and incorporated into one of the subsidence areas. Stopped for the day at ditch station 7+00.

July 16, 1997

Opened 30 feet of fence at the eastern end of the ditch to hook the ditchline toward the rip rap that runs down to the settlement pond. Finished regrading the base of the ditch today.

July 17, 1997

Placed and compacted clay in the ditchline. Collected two Shelby tube and small bag samples for analysis. Stopped for the day at ditch station 6+80.

July 18, 1997

Placed and compacted clay in the ditch. Collected one Shelby tube and small bag sample for analysis. Finished clay placement along the ditch today. Stopped adding clay at ditch station 11+30, as it was outside the clay cap area.

Weeks 5-7: July 21, 1997 - August 8, 1997

No construction - rain delay.

Week 8: August 11 - 15, 1997

Julie Hoffman of Dames & Moore provided construction oversight. Frattalone conducted construction activities.

August 11, 1997

Placed and compacted the buffer soils along the south perimeter ditch. Completed the entire ditch today. Had to haul an additional 12 truckloads of buffer soils to finish the ditch. The ditch will be seeded within the next couple weeks.

August 12, 1997

Finished final grading of the landfill surface and the restored access road. Collected the sample from the clay borrow source.

Week 9: August 18 - 22, 1997

No work this week.

Week 10: August 25 - 29, 1997

No work this week.

Week 11: September 1 - 5, 1997

No work this week.

Week 12: September 8 - 12, 1997

No work this week.

Week 13: September 15 - 19, 1997

Julie Hoffman of Dames & Moore provided construction oversight. Terra on site doing gas extraction piping and assemblies.

Removed the passive vent system by cutting off the PVC risers below the clay layer and adding a cap to the riser line. Excavated the existing lateral piping that handles gas and condensate from GEW-13 and GEW-15. Existing elevations of pipe and tees match those established in the Record Drawings for the site, October 1993. No rebedding of pipe required along this stretch. Removed the cap from the lateral extending to GEW-13. Frattalone hit this line during the regrade of the subsidence area. Terra cut out the broken section and replaced with new pipe. Added a wye connection for GEW-19 approximately 10 feet north of the tee to GEW-13. Elevation at this tee was 1013.27 mean sea level (MSL). Elevation of the riser elbow at GEW-19 was 1019.75 MSL with a slope of 3.1 percent toward the main lateral. Added a gas wellhead assembly to GEW-19 and used a covered culvert pipe as the protective structure around the well. Began excavating the lateral that handles gas and condensate from GEW-9, GEW-12, GEW-10 and GEW-11. The lateral piping has settled considerably from Record Drawing elevations. Rebed the pipe with a slope of 3.0 percent from the tee feeding GEW-10 and GEW-11 south to the tee to GEW-9. The new elevation of the tee to GEW-10 and GEW-11 is 1016.20 MSL. The new elevation at the tee to GEW-12 is 1013.68 and that at the tee to GEW-9 is 1013.08 MSL. Terra also added two gas monitoring ports along this length of pipe. The first is placed ten feet south of the tee to GEW-10 and GEW-11 at a final box elevation of 1023.56 MSL. The second is placed 50 feet south of the first at a final box elevation of 1021.34 MSL. The piping to GEW-11 is rebed at a slope of 1.7 percent. The piping to GEW-10 is rebed at a slope of 2 percent toward GEW-20 and GEW-10. The new well, GEW-20 is connected to the lateral with a tee and riser. The elevation of the tee to GEW-20 is 1020.06 MSL.

Week 14: September 22 - 24, 1997

Julie Hoffman of Dames & Moore provided construction oversight. Terra on site doing gas extraction piping and assemblies.

Rebed the lateral piping extending between GEW-20 and GEW-10 at a slope of 1.5 percent. The elbow to the riser at GEW-10 has an elevation of 1022.45 MSL. Connected the existing leachate extraction well, LEW-1 to the lateral piping near GEW-9. The elevation of the wye to LEW-1 is 1015.18 MSL. The elevation of the elbow at the riser to LEW-1 is 1016.33

MSL. Inspected the pipe near GEW-21 and added pipe from the existing lateral to GEW-21. The existing pipe settled, but slope is sufficient (2 percent). The elevation at the new tee to GEW-21 is 1013.62 MSL. The elevation of the pipe 50 feet south of this tee is 1012.64 MSL. The elevation of the elbow at the riser to GEW-21 is 1014.62 MSL. Installed two more gas monitoring ports along this stretch of pipe. The northernmost (elevation 1019.68 MSL) is located 10 feet south of the tee to GEW-21 and the southern one (elevation 1019.51 MSL) is located 50 feet south of the first. Inspected the pipe near GEW-7. The elevation of the tee at GEW-7 is 1016.40 MSL. Pipe has also settled in this area, but slopes at 2 percent toward south. Added gas wellhead assemblies and piston pumps to GEW-20 and GEW-21. Added the piston pump assembly to LEW-1. Placed protective structures (wooden sheds) over LEW-1, GEW-20 and GEW-21. Regraded the south perimeter ditch to remove soil that settled in the ditch centerline. Restored the bank in areas along the fenceline where it washed out during heavy rain. Built up the ground around each manhole in the ditch to prevent the plows from clipping off the tops of the manholes. Added a post with a reflector at each manhole. Placed silt fence along the inside of the landfill near the southern perimeter to minimize runoff into the ditch. Surveyed the new wells' top of casing and the monitoring box tops. The electrical conduit is trenched from the pumping wells to the control box and down to the blower building. Seed is placed along the disturbed areas on the landfill surface and south perimeter ditch.

Week 15: September 29, 1997 - October 3, 1997

No construction this week.

Week 16: October 6 - 10, 1997

No construction this week.

Week 17: October 13 - 17, 1997

Julie Hoffman of Dames & Moore was on site providing construction oversight.

Terra completed the installation of the piston pumps and downhole electric submersible pumps. Blackhawk Environmental (piston pump supplier) is on-site October 17 to assist with the installation of the piston pump motors. T&J Electric finished the electrical work at the site.

3.2 SUBCONTRACTORS

Frattalone Excavating and Grading of Minneapolis, Minnesota was subcontracted by Terra to regrade and line the south perimeter ditch, excavate the uncapped waste and regrade the subsidence areas. T&J Electric of Merrill, Wisconsin was subcontracted by Terra to install the electrical portion of the work, including the piston pump and electric submersible pump configuration and tie-in to the condensate tank and gas extraction system shutdown.

3.3 SYSTEM CONSTRUCTION DESCRIPTIONS

3.3.1 Waste Excavation, Consolidation and Soils Testing

3.3.1.1 Landfill Cap

Approximately 1211 cubic yards of uncapped waste, located along the northwestern perimeter of the landfill, was excavated and hauled to the top of the landfill. After the clay cap was pulled back, the waste was used to bring the subsidence areas back to grade. The waste was covered with a layer of sand, and then compacted in place. The two-foot clay layer was replaced and compacted. Samples of the compacted lifts were collected and analyzed. Results of the sampling events are shown in Table 3.1. All samples met the WDNR guidelines for NR500 landfill caps. Thirty inches of rooting zone materials were placed above the compacted clay cap. Finally, six inches of topsoil were placed above the rooting zone, completing the regrade of the cap. The landfill surface was seeded after the project was complete. Some growth took place before winter, but it is anticipated that regrading and seeding may be necessary in spring. The uncapped waste areas were backfilled with excess buffer soils from the ditch regrade.

3.3.1.2 South Perimeter Ditch

The south perimeter ditch was regraded to permit drainage of runoff from the landfill. The eastern end of the ditch was funneled toward the southeast retention pond. The western end of the ditch followed the ditchline, and ran beneath the site access road through an existing culvert. Two feet of clay were placed and compacted in areas of the ditch, as needed. Samples of the clay lifts were collected for analyses. Results of that sampling are shown in Table 3.2. Six to thirty inches of rooting zone and six inches of topsoil were placed above the compacted clay. With the heavy rains,

some erosion along the ditchline occurred. This was regraded as necessary until seeding of the ditch could take place. Some growth took place before winter, but it is anticipated that some regrading and seeding of the ditch may be necessary in Spring 1998.

3.3.2 Gas Extraction Well Installation

Gas extraction well, GEW-19, was installed on July 2, 1997 by Terra. A 3-foot diameter caisson drill was advanced to a depth of 50.5 feet. Gas extraction wells, GEW-20 and GEW-21, were installed on July 3, 1997 by Terra. Wells GEW-20 and GEW-21 were drilled to depths of 64 feet and 68 feet, respectively. Six-inch PVC slotted pipe was used as the screen material and connected to the six-inch PVC riser pipe. The filter pack material was one- to two-inch diameter gravel. A seven-foot layer of hydrated bentonite chips was used to provide a surface air barrier. All materials were gravity installed. Copies of the well construction forms are located in Appendix C.

3.3.3 Gas Extraction System Piping

Approximately 300 linear feet (lf) of 3-inch diameter SDR 17 HDPE gas lateral pipe were installed during this project. The butt fusing technique was used to connect the lengths of pipe. The pipes were placed on the trench bottom, and the trench was backfilled with 2 feet of granular material. The granular layer was compacted by three passes with a vibratory compactor. The remainder of the trench was filled with native soil and compacted with a sheepsfoot compactor.

A 2-inch diameter riser from the gas lateral pipe extended above the ground surface for connection to the wellhead assembly.

3.3.4 Gas Extraction Wellhead Assemblies

The connection between the 6-inch diameter extraction well and the 2-inch diameter wellhead assembly was made with a 6-inch x 2-inch reducing coupling. Fernco couplings were used to connect the wellhead assemblies to the reducing couplings and the flexible hoses. Fernco couplings also were used to connect the flexible hose to the 2-inch diameter risers, which are connected to the gas lateral pipe. A protective structure was installed around each wellhead assembly. For GEW-19, the protective structure was an 8-foot length of 4-foot diameter corrugated culvert pipe. A hinged, lockable cover was placed on top of the culvert pipe. For GEW-20 and GEW-21, a prefabricated

wooden shed was used as the protective structure. A larger structure was necessary because the piston pump required approximately four feet of clearance above the top of the well. All wellhead assembly and leachate delivery pipes located above grade were insulated. Each gas wellhead assembly includes a gate valve to control gas flow, and a thermometer and two pressure connections for monitoring landfill gas.

3.3.5 Vacuum Monitoring Ports

Four vacuum monitoring ports were installed along two sections of gas lateral/header piping in the southeast corner of the landfill where significant settling has occurred. The vacuum monitoring ports, at a minimum, will provide additional survey points to determine settlement of the gas lateral lines in the southeast corner of the landfill. It is possible that vacuum levels over time will indicate that settlement or liquid blockages are reducing the effective vacuum on the wells in that area. It is not certain if these effects will be observable along the lengths of pipe where the vacuum monitoring ports were installed. A historical database, developed through routine monitoring, will permit evaluating statistically significant changes in vacuum.

3.3.6 Leachate Pumps

Two types of leachate pumps were installed in the gas extraction wells located in the southeast corner of the landfill. Wells LEW-1, GEW-20 and GEW-21 have electrical piston pumps, while wells GEW-7, 8, 9, and 10 have electrical submersible pumps.

The piston pumps are controlled by down-well level sensors. When sufficient leachate levels are present, the pumps will activate. The piston pump continues to run until leachate levels drop below the "low-level" sensor within the well. There is no flow measurement device installed on the piston pumps.

The electric submersible pumps are controlled by amperage draw. When an underload condition exists, the pumps are automatically turned off. The pumps are automatically restarted after a pre-determined period, set on the individual timers for each well. The total running time is monitored by the counter. Individual well flow measurement is not possible.

All pumps are tied into the condensate/leachate tank and gas extraction system. If the gas extraction system shuts down, power to the leachate pumps is also disrupted. If the high level alarm in the leachate tank is activated, the gas extraction system is shut down, which in turn, shuts down the leachate pumping system.

3.4 SYSTEM START UP

3.4.1 Start Up Activities

The system was initially started on October 20, 1997. However, because high oxygen levels were detected at the blower, the system was shut down on October 21, 1997. Investigations by SEH led to the discovery that the 3-inch lateral to GEW-13, GEW-14, and GEW-15 had separated from the field-manufactured "tee" to the header pipe in the manhole along Alexander Road. Several other constructability issues were noted during the October 21, 1997 pre-final inspection by Dames & Moore, SEH and the WDNR (See Appendix D). These items were addressed when Terra returned to the site on November 4, 1997.

The leachate system was started on October 20, 1997. Approximately 3,327 gallons of leachate were pumped from the tank on October 22, 1997, under SEH supervision. Leachate pumping since that time has been handled by AllPhase. An additional 8,742 gallons were pumped from the leachate tank, averaging 2,200 gallons per month. Approximately 2,175 gallons, 3,606 gallons, and 2,961 gallons were removed from the leachate tank on November 26, 1997, January 5 and February 19, 1998, respectively.

3.5 PROJECT COMPLETION

The project was essentially complete at the time of the initial system start up on October 20, 1997. Items completed on November 4, 1997 included:

- Repaired break in connection to 3-inch lateral line feeding GEW-13, GEW-14, and GEW-15 at the western manhole along Alexander Road.
- Repaired leaking connection at LEW-1 between piston pump motor and riser pipe.

- Added control relay that shuts down blower and flare as well as leachate pumps when the leachate tank fills. Added control relay that shuts leachate pumps off if the blower and/or flare shut down.
- Repaired/replaced level floats in leachate tank so high level in tank is indicated and system shuts down. (Level floats were operating correctly. Switch inside control panel was in "off" position.)
- Surveyed area near LEW-1 and electrical box on landfill. (Will regrade in the spring of 1998, if area is not adequately sloped for drainage.)
- Drilled out the rubber gasket blocking the access port for leachate level measurement in GEW-20, GEW-21 and LEW-1.
- Freed the plugged material in the culvert pipe that runs beneath the access road north of the storage shed so runoff from the landfill may drain through the culvert.

3.6 CONSTRUCTION DOCUMENTATION PHOTO LOG

Photographs of the construction activities were taken during start up activities. These photos are documented in Appendix B.

3.7 DEVIATIONS FROM TECHNICAL SPECIFICATIONS

All construction installation work on this project was performed in accordance with the technical specifications. During startup, pressure testing of the gas header and lateral lines was not conducted. Because pressure testing of the entire system would require extensive effort, it was decided to start the system and then determine if any leaks had developed. After startup, high oxygen levels were present at the blower. To locate the source of oxygen infiltration, the perimeter of the header pipe was walked. The manholes were opened and inspected for breakage in the lines. SEH personnel found the one line break in the western manhole along Alexander Road. This line was repaired and the system restarted. Oxygen levels at the blower decreased below one percent. Additional leakage was detected from the pumping system appurtenances installed in GEW-20 and GEW-21. These leaks were sealed. Oxygen levels at these wells dropped below one percent, and the wells were slowly brought into service, beginning December 16, 1997. All other gas extraction wells that were operating before the construction project, were brought back into service without incident. Methane levels at the blower have ranged from 48 percent to 56 percent since startup of the system.

Table 3.1
Soils Analyses for the Landfill Cap Sampling
Former Junker Landfill, Town of Hudson, WI

Sample I.D.	Sieve Analysis - passes 200 sieve	Saturated Hydraulic Conductivity, cm/s	Liquid Limit	Plasticity Index
NR504 Guidelines	minimum 50% by weight	$1x10^{-7}$ or less	Avg 25 or more; no value <20	Avg 12 or more; no value <10
x=5+50, y=0+80 Lift 3	62.80%	$8x10^{-8}$	44	27
x=8+00, y=4+00, Lift 3	58.29%	$4.5x10^{-8}$	38	24
x=8+10, y=1+15, Lift 1	59.12%	$2.6x10^{-8}$	34	20
AVERAGE	---	---	*38.7*	*23.7*

Table 3.2
Soils Analyses for the South Perimeter Ditch Sampling
Former Junker Landfill, Town of Hudson, WI

Sample I.D.	Sieve Analysis - passes 200 sieve	Saturated Hydraulic Conductivity, cm/s	Liquid Limit	Plasticity Index
NR504 Guidelines	minimum 50% by weight	$1x10^{-7}$ or less	Avg 25 or more; no value <20	Avg 12 or more; no value <10
x=8+50, y=11, Lift 3	45.83%*	$1.7x10^{-7}$	26	11
x=3+55, y=13, Lift 2	66.97%	$4x10^{-8}$	43	27
x=10+75, y=14.5, Lift 1	49.18%*	---	27	12
x=5+00, y=4, Lift 3	47.16%*	---	26	12
x=7+20, y=13, Lift 3	47.34%*	---	25	11
AVERAGE	---	---	*29.4*	*14.6*

Notes: * Soils classify as SC (sandy clay); however, borderline condition does not affect liner performance.

4.0 OPERATION AND MAINTENANCE

Proper operation and maintenance (O&M) of the equipment is essential to optimize the performance of the remediation system. O&M personnel will perform routine operation and maintenance activities. The O&M activities include the operation of the gas extraction system as well as monitoring of the site monitor wells and gas probes and quarterly or annual sampling of the private wells.

4.1 SYSTEM OPERATION

4.1.1 System Start Up Issues

The system was started on October 20, 1997. Several operational problems were experienced during the first month of operation. These included the initial high oxygen levels at the blower which were remedied by repairing the break in the header line at the western manhole along Alexander Road. Also, high oxygen levels were initially recorded in GEW-20 and GEW-21. The piston pump system on these wells allowed for areas of oxygen infiltration. These areas were sealed on November 24, 1997, with oxygen levels at or below one percent. Subsequent site activities slowly brought these wells into production, and are discussed further in Section 5.1.

4.1.2 System Alarm Details

Several new alarms were installed/activated with the installation of the leachate extraction system. If a high level alarm exists in the leachate tank, the leachate pumping wells and gas extraction system will shut down. Also, if the gas extraction system shuts down for any reason, the leachate extraction system will also cease operation.

4.2 OPERATION AND MAINTENANCE FIELD LOG

An O&M/Monitoring field log will be completed by OM&M personnel whenever monitoring activities are performed on site. This log will include the date and time of activities, the reason for the site visit, an explanation of any unplanned maintenance, and a detailed list of the work performed during the site visit. A copy will be filed in the OM&M contractor office central files and included

in progress reports to the WDNR and client. A brief field log is also kept on site in the blower building. This lists the date, time, personnel and the reason for the visit.

4.3 OPERATION AND MAINTENANCE SCHEDULES

Operation and Maintenance for this system was described in the OM&M Report for this site, dated April 25, 1997. Updated OM&M tables are provided in this section. Quarterly monitoring should be performed in January, April, July and October, while semi-annual sampling should be performed in July and October. Changes to this proposed schedule must be approved by the WDNR. Also, the monitoring frequency of the gas extraction system is based on a well-balanced operating system. If unbalanced conditions develop, more frequent monitoring is necessary to return the system to a balanced operation. A copy of the SWCA map showing the private well locations is included after Tables 4.1 and 4.2. For text corresponding to the individual OM&M tasks, please refer to the April 1997 OM&M report.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

	Task Description	Frequency
FENCED AREA AT FLARE BUILDING	Check blower/flare for vandalism and check flame sensor	Weekly
	Measure oxygen (O_2), methane (CH_4), carbon dioxide (CO_2), and balance gas at blower **Historically[1]: O_2 0.0 - 3.6 percent** **CH_4 34.9 - 58.0 percent** **CO_2 32.0 - 50.7 percent**	Weekly
	Record blower pressure reading **Historically[1]: -56.0 - -3.5 in. H_2O**	Weekly
	Record header line pressure reading **Historically[1]: -25.5 - -0.52 in. H_2O**	Weekly
	Measure temperature	Weekly
	Measure/calculate gas flow and velocity at blower **Historically[1]: Gas flow 101 - 351 ft^3/min** **Velocity 513 - 1790 ft/min**	Weekly
	Measure static pressure after blower **Historically[1]: 0.09 - 2.9 in. H_2O**	Weekly
	Check blower/flare fasteners	Weekly
	Check explosion relief valve operation	Weekly
	Measure leachate level in condensate tank	Weekly
	Remove leachate from condensate tank	Bi-Weekly[2]
	Lubricate blower motor	Weekly
	Calculate extracted gas volumes at blower	Bi-weekly

[1] Taken from Quarterly Operation, Maintenance, and Monitoring Report - January 1997, prepared by SEH, Inc., February 1997.

[2] Leachate volumes are estimated at 2,050 gallons/week. The leachate tank shuts off the leachate extraction system when full.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

	Task Description	Frequency
FENCED AREA AT FLARE BUILDING (Continued)	Exercise valves at blower	Monthly
	Measure pressure drop across flame arrestor; record downstream pressure as pressure to flare also **Historically[1]: ΔP= -0.11 - 1.6 in H_2O**	Monthly
	Sample blower for TO-14 VOC scan	Quarterly for two years and Annually thereafter
	Confirm seals in both driplegs - sediment not obstructing "U" position	Quarterly
LANDFILL GAS EXTRACTION WELLS GEW-1, GEW-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, GEW-19, GEW-20, GEW-21	Inspect well head piping	Weekly
	Inspect for well head vandalism	Weekly
	Measure well head temperature Exercise well head valves	Monthly
	Measure well head vacuum Measure lateral vacuum at well head Measure leachate depths at well head - perform other measurements first **Historical Information[2]:**	Monthly

Well No.	Head Vacuum in. H_2O	Lateral Vacuum in. H_2O	Leachate Depth feet
GEW-1	-0.52 to 0.3	-12.3 to -2.43	0 to 4.8

[2]Taken from Quarterly Operation, Maintenance, and Monitoring Report - January 1997, prepared by SEH, Inc., February 1997.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

Task Description					Frequency
LANDFILL GAS EXTRACTION WELLS GEW-1, GEW-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, GEW-19, GEW-20, GEW-21 (Continued)	GEW-2	-0.57 to0.29	-11.0 to -1.99	0.0 to 0.7	Monthly
	GEW-3	-2.63 to 0.5	-11.0 to 0.1	1.3 to 2.7	
	GEW-4	-.84 to 0.35	-15.7 to -2.21	0.0 to 1.9	
	GEW-5	-4.43 to0.51	-11.06 to 0.5	0.0 to 1.5	
	GEW-6	-2.58 to0.41	-12.45 to 0.2	0.0 to 3.0	
	GEW-7	-1.5 to 0.33	-27.0 to -2.54	8.4 to 11.4	
	GEW-8	-7.0 to -0.02	-20.1 to -0.5	8.4 to 16.4	
	GEW-9	-8.6 to -0.13	-18.4 to -1.31	0.0 to 6.3	
	GEW-10	-6.1 to 0.59	-13.0 to -0.5	0.0 to 12.8	
	GEW-11	-4.28 to0.52	-10.8 to -0.5	2.1 to 14.9	
	GEW-12	-2.13 to0.44	-14.0 to -1.0	0.0 to 3.6	
	GEW-13	-1.33 to0.35	-27.0 to -1.59	0.29 to 1.8	
	GEW-14	-0.23 to0.34	-13.1 to- 1.06	0.0 to 0.3	
	GEW-15	-4.5 to 0.31	-14.1 to -2.12	0.0 to 0.3	
	GEW-17	-0.73 to 0.5	-15.4 to -2.28	0.0 to 0.4	
	GEW-18	-0.74 to0.37	-12.5 to -2.61	0.1 to 0.5	

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

	Task Description					Frequency
LANDFILL GAS EXTRACTION WELLS GEW-1, GEW-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, GEW-19, GEW-20, GEW-21 (Continued)	Measure well head O_2, CH_4, CO_2, and balance gas Check and record valve opening on wells **Historical Information[3]:**					Monthly
	Well No.	**% O_2**	**% CH_4**	**% CO_2**	**Accu-Flo (cfm)**	
	GEW-1	0.0 - 22.7	0.0 - 59.5	0.0 - 51.3	0	
	GEW-2	0.0 - 21.2	1.5 - 58.9	1.4 - 38.5	0-10	
	GEW-3	0.0 - 23.7	0.8 - 62.5	0.6 - 42.1	0-5	
	GEW-4	0.0 - 10.3	12.1 - 63.4	23.9 - 41.5	0-12	
	GEW-5	0.0 - 19.3	12.1 - 65.4	23.9 - 45.0	5-12	
	GEW-6	0.0 - 20.8	12.1 - 55.1	23.4 - 48.2	0-7	
	GEW-7	0.0 - 9.9	12.1 - 63.1	16.2 - 48.8	5-35	
	GEW-8	0.0 - 4.1	12.1 - 59.01	23.9 - 48.6	15-30	

[3]Taken from Quarterly Operation, Maintenance, and Monitoring Report - January 1997, prepared by SEH, Inc., February 1997.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

Task Description						Frequency
LANDFILL GAS EXTRACTION WELLS GEW-1, GEW-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, GEW-19, GEW-20, GEW-21 (Continued)	GEW-9	0.0 - 3.3	12.1 - 61.0	23.9 - 46.0	5-25	Monthly
	GEW-10	0.0 - 2.7	12.1 - 59.0	23.9 - 45.5	15-30	
	GEW-11	0.0 - 7.7	12.1 - 59.8	23.9 - 45.5	20-30	
	GEW-12	0.0 - 1.4	12.1 - 59.8	23.9 - 45.6	6-20	
	GEW-13	0.0 - 2.9	20.7 - 56.9	25.1 - 35.4	0-6	
	GEW-14	0.0 - 19.9	12. 1 - 59.0	19.4 - 43.5	2	
	GEW-15	0.0 - 21.1	12.1 - 59.0	2.7 - 40.2	0	
	GEW-17	0.0 - 22.3	0.0 - 59.0	0.0 - 40.2	0	
	GEW-18	0.0 - 19.9	4.5 - 59.8	3.5 - 40.2	0	
	Measure/calculate well head gas flow and velocity					
	Well No.		**Historical Performance[4]**		**Target Flow Range[4] (acfm)**	
	GEW-1		Closed; Historically bad		0	

[4]Taken from Report of Evaluation and Oversight of Operation and Maintenance at the Junker Landfill St. Croix County, Wisconsin, prepared by Gas Control Engineering, October 10, 1994. Note: The target values are subjective. Targets need to be adjusted to accommodate changing conditions and observation of well response. Flow rate based on 3 in Sch 80 PVC pipe and a cross-sectional area of 0.0459 sq. Feet. Differences due to rounding.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

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Task Description				Frequency
LANDFILL GAS EXTRACTION WELLS GEW-1, GEW-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, GEW-19, GEW-20, GEW-21 (Continued)	GEW-2	Overpulled; Has potential from past performance	14-18	Monthly
	GEW-3	Overpulled; Good to mostly poor	0	
	GEW-4	Historically overpulled; Mostly poor	14-18	
	GEW-5	Good to moderately poor; High O_2	14-23	
	GEW-6	Good to moderately poor; High O_2	18-23	
	GEW-7	Now overpulled; Historically strong	23-32 +	
	GEW-8	Historically strong; Try to maintain CH_4 concentration	14-28	
	GEW-9	Slight deterioration of CH_4 quality	11-23	
	GEW-10	Try to maintain CH_4 concentration; CH_4 may decline	18-23	
	GEW-11	Try to maintain CH_4 concentration; CH_4 may decline	18-23	
	GEW-12	Slightly to moderately overpulled	18-32	
	GEW-13	Overall poor quality	14-23	
	GEW-14	Low CH_4 quality; Poor performer	0	
	GEW-15	Overall poor CH_4 quality; Well closed	0	

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

Task Description				Frequency
LANDFILL GAS EXTRACTION WELLS (Continued)	GEW-17	Overpulled; Poor performer	0	Monthly
	GEW-18	Overpulled; Poor performer	0	
LEACHATE EXTRACTION WELLS GEW-7, GEW-8, GEW-9, GEW-10, GEW-20, GEW-21, LEW-1	Adjust piston pump stroke frequency as necessary (GEW-20, GEW-21, LEW-1)			Weekly
	Record drawdown in each well			
VACUUM MONITORING PORTS VM-1, VM-2, VM-3, VM-4	Record vacuum at each vacuum monitoring port on the landfill surface (four ports)			Monthly
LANDFILL CAP	Observe the condition of the ground: frozen/wet soils, ponding water, stressed vegetation, etc.			Weekly
	Differential settling - repair			Annually
	Erosion - repair			Immediate if major
	Vegetative deterioration/dead areas and growth - repair			Semi-annual
	Condition of access road - repair			As needed
	Condition of drainage ways, spillways, erosion control structures, and devices - repair			As needed
	Effectiveness of infiltration basins based on monthly precipitation amounts			Monthly
	Leachate seeps - inspect for and if present sample for SVOCs (Method 8270)and RCRA metals (ICP)			Monthly
ATMOSPHERIC DATA	Record ambient temperature, barometric pressure and barometric pressure trend			Weekly

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

	Task Description	Frequency
GAS PROBES GMW-1A, GMW-1B, GMW-2A, GMW-2B, GMW-3, GMW-4A, GMW-4B, GMW-5S, GMW-5I, GMW-5D, GMW-6S, GMW-6I, GMW-6D, GMW-7, GMW-8S, GMW-8I, GMW-8D, GMW-9, GMW-10, GP3-Res, GP4-Res, MW-7	Inspect probe for repair/maintenance	Monthly
	GMW-2, GMW-3, GMW-5 thru GMW-10 : Sample for VOC analysis; TO-14 scan	Quarterly
	Measure probe O_2, CH_4 and CO_2 , balance gas and vacuum; record static pressure **Historical Information[5]:**	Monthly

Well No.	O_2 %	CH_4 %	CO_2 %	Press. in. H_2O
GMW-1A	5.9 - 23.6	0.0 - 0.2	0.0 - 14.0	-0.5 to 0.5
GMW-1B	5.1 - 23.4	0.0 - 0.2	0.0 - 15.6	-0.5 to 0.5
GMW-2A	0.0 - 23.4	0.0 - 68.3	0.0 - 40.5	-0.3 to 0.25
GMW-2B	0.0 - 23.4	0.0 - 79.8	0.0 - 47.6	-0.47 to 0.40
GMW-3	12.5 - 23.2	0.0 - 0.3	0.0 - 16.4	-0.19 to 0.65
GMW-4A	8.0 - 23.3	0.0 - 0.4	0.0 - 9.8	-0.5 to 0.26

[5]Taken from Quarterly Operation, Maintenance, and Monitoring Report - January 1997, prepared by SEH, Inc., February 1997.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

Task Description						Frequency
GAS PROBES GMW-1A, GMW-1B, GMW-2A, GMW-2B, GMW-3, GMW-4A, GMW-4B, GMW-5S, GMW-5M, GMW-5D, GMW-6S, GMW-6M, GMW-6D, GMW-7, GMW-8S, GMW-8M, GMW-8D, GMW-9, GMW-10, GP3-Res, GP4-Res, MW-7 (Continued)	GMW-4B	13.9 - 23.3	0.0 - 0.4	0.0 - 5.6	-0.20 to 0.30	Monthly
	GMW-5S[6]	7.1 - 8.6	2.2 - 3.6	9.8 - 11.6	-0.16 to 0.01	
	GMW-5M[6]	3.2 - 5.9	1.8 - 7.8	11.2 - 16.2	-0.32 - 0.01	
	GMW-5D[6]	14.4 - 19.3	0.3 - 2.9	0.9 - 5.7	-0.28 - 0.01	
	GMW-6S[7]	0.0 - 12.8	12.0 - 12.5	9.8 - 22.3	-0.07 - 0.01	
	GMW-6M[7]	1.9 - 12.1	14.0 - 39.2	10.5 - 24.6	-0.21 - 0.08	
	GMW-6D[7]	1.0 - 2.5	28.5 - 30.1	23.2 - 27.0	-0.28 - 0.06	

[6]Installed October 30, 1996; Historic information based on two readings.

[7]Installed October 30, 1996; Historic information based on two readings.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

Task Description						Frequency
GAS PROBES GMW-1A, GMW-1B, GMW-2A, GMW-2B, GMW-3, GMW-4A, GMW-4B, GMW-5S, GMW-5M, GMW-5D, GMW-6S, GMW-6M, GMW-6D, GMW-7, GMW-8S, GMW-8M, GMW-8D, GMW-9, GMW-10, GP3-Res, GP4-Res, MW-7 (Continued)	GMW-7[7]	0.0 - 9.2	6.6 - 11.7	12.8 - 21.7	-0.24 - 0.02	Monthly
	GMW-8S[7]	17.8 - 19.2	0.0 - 0.2	1.2 - 1.8	-0.04 - 0.01	
	GMW-8M[7]	19.0 - 19.8	0.0	0.4 - 0.8	-0.06 - 0.01	
	GMW-8D[7]	10.5 - 11.2	0.0 - 0.1	6.2 - 8.4	-0.30 - 0.30	
	GMW-9[7]	0.7 - 18.2	0.0 - 0.6	1.2 - 6.0	-0.47 - 0.10	
	GMW-10[7]	19.7 - 20.1	0.0	0.0 - 0.3	-0.67 - 0.67	
	GP3-Res	0.0 - 11.3	0.0 - 5.7	7.1 - 12.9	0	
	GP4-Res	2.1-21.0	0.0	0.0-12.0	-0.69 - 1.10	
	MW-7	0.0 - 23.7	0.0 - 17.5	0.0 - 32.3	0	
LANDFILL LEACHATE HEAD WELLS LHW-1, LHW-2, LHW-3, LHW-4	Inspect well head piping					Monthly
	Inspect for well head vandalism					Monthly
	Measure leachate depths at well head					Monthly
	Well No.	**Historical Depth (Feet)[88]**				
	LHW-1	2.3 - 5.2				
	LHW-2	0.3 - 12.9				
	LHW-3	0.0 -0.4				
	LHW-4	10.35 (installed 10/31/96)				

[8]Taken from Quarterly Operation, Maintenance, and Monitoring Report - January 1997, prepared by SEH, Inc., February 1997.

Table 4.1
Operation & Maintenance Requirements
Former Junker Landfill, Town of Hudson, WI

The frequency of tasks listed in this table are appropriate for a balanced gas extraction system. When unbalanced conditions exist (after startup, climatic changes, new construction, etc.), more frequent monitoring is necessary until the system is balanced. Quarterly monitoring and maintenance should be performed in January, April, July and October while semi-annual should be performed in January and July, unless otherwise approved by WDNR.

	Task Description	Frequency
PRIVATE RESIDENCE METHANE MONITORS	Check methane monitor in basements at 888, 890 and 898 E. Highway 12 - perform maintenance if required	Every 6 weeks
MISCELLANEOUS	Buildings - note damage	Monthly
	Site fence - note damage	Monthly
	Culverts - note damage or plugging	Monthly
	Garbage Accumulation/Removal	Monthly
	Snow Removal	Perform as required to complete O & M tasks
	Mowing	Twice per year
	Condition of concrete pads - note damage	Monthly
	Condition of telephone and electrical services - note changes if any	Monthly
	Record electrical meter reading and report to St. Croix Electric Cooperative	Monthly

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
MW-3	Groundwater elev, temperature,	72020, 00010	Quarterly	Landfill monitoring well network; historic
MW-4	conductivity at 25°C,	00094		exceedances of TCE and PCE
MW-5	pH	00400		
MW-6	alkalinity, filtered	39036		
MW-7	total hardness, filtered	22413		
MW-8	manganese, dissolved	01056		
MW-9	iron, dissolved	01046		
MW-10	chloride, filtered	82295		
WW-11	COD, filtered	00341		
WW-12	***VOCs (Method 8021):***			
WW-13	Dichlorodifluoromethane	34668		
WW-14	Chloromethane	34418		
WW-15A	Vinyl chloride	39175		
WW-15B	Bromomethane	34413		
WW-15C	Chloroethane	34311		
WW-16	Trichlorofluoromethane	34488		
	1,1-Dichloroethene	34501		
	Methylene chloride	34423		
	MTBE	78032		
	trans-1,2-Dichloroethene	34546		
	Isopropyl ether	81577		
	1,1-Dichloroethane	34496		
	2,2-Dichloropropane	77170		
	cis-1,2-Dichloroethene	77093		
	Chloroform	32106		
	Bromochloromethane	77297		
	1,1,1-Trichloroethane	34506		
	1,1-Dichloropropane	77168		
	Carbon Tetrachloride	32102		
	1,2-Dichloroethane	32103		
	Benzene	34030		
	Trichloroethene	39180		
	1,2-Dichloropropane	34542		
	Bromodichloromethane	32101		
	Dibromomethane	77596		
	cis-1,3-Dichloropropene	34704		
	Toluene	34010		
	trans-1,3-Dichloropropene	34699		
	1,1,2-Trichloroethane	34511		
	1,3-Dichloropropane	77173		
	Tetrachloroethene	34475		
	Dibromochloromethane	32105		
	1,2-Dibromomethane	77651		
	Chlorobenzene	34301		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
(continued from previous page)	1,1,1,2-Tetrachloroethane	77362		
	Ethylbenzene	78113		
	meta,para-Xylene	85795		
Also collect:	Styrene	77128		
Trip Blank (1)	ortho-Xylene	77135		
Duplicates (2)	Isopropylbenzene	77223		
	Bromoform	32104		
	1,1,2,2-Tetrachloroethane	34516		
	1,1,3-Trichloropropane	77443		
	n-Propylbenzene	77224		
	Bromobenzene	81555		
	1,3,5-Trimethylbenzene	77226		
	2-Chlorotoluene	77275		
	4-Chlorotoluene	77277		
	tert-Butylbenzene	77353		
	1,2,4-Trimethylbenzene	77222		
	sec-Butylbenzene	77350		
	p-Isopropyltoluene	77356		
	1,3-Dichlorobenzene	34566		
	1,4-Dichlorobenzene	34571		
	n-Butylbenzene	77342		
	1,2-Dichlorobenzene	34536		
	1,2-Dibromo-3-Chloropropane	38437		
	1,2,4-Trichlorobenzene	34551		
	Hexachlorobutadiene	34391		
	Naphthalene	34696		
	1,2,3-Trichlorobenzene	77613		
Condensate/leachate from holding tank	Field conductivity	00094	Quarterly	
	Field pH	00400		
	Total suspended solids (TSS)			
	Alkalinity (total)	00410		
	Hardness (total)	00900		
	Sodium (total)	00929		
	Phosphorous (total)	00665		
	Manganese (total)	01055		
	Iron (total)	74010		
	Chloride (total)	00940		
	SO_4 (total)	00945		
	COD (unfiltered)	00340		
	BOD_5	00310		
	NH_3-N (total)	00610		
	Volume removed from tank	00032	As required	

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
Condensate/leachate from holding tank (continued)	*VOCs (Method 8021)*			
	Dichlorodifluoromethane	34668	Semi-annually	
	Chloromethane	34418		
	Vinyl chloride	39175		
	Bromomethane	34413		
	Chloroethane	34311		
	Trichlorofluoromethane	34488		
	1,1-Dichloroethene	34501		
	Methylene chloride	34423		
	MTBE	78032		
	trans-1,2-Dichloroethene	34546		
	Isopropyl ether	81577		
	1,1-Dichloroethane	34496		
	2,2-Dichloropropane	77170		
	cis-1,2-Dichloroethene	77093		
	Chloroform	32106		
	Bromochloromethane	77297		
	1,1,1-Trichloroethane	34506		
	1,1-Dichloropropane	77168		
	Carbon Tetrachloride	32102		
	1,2-Dichloroethane	32103		
	Benzene	34030		
	Trichloroethene	39180		
	1,2-Dichloropropane	34542		
	Bromodichloromethane	32101		
	Dibromomethane	77596		
	cis-1,3-Dichloropropene	34704		
	Toluene	34010		
	trans-1,3-Dichloropropene	34699		
	1,1,2-Trichloroethane	34511		
	1,3-Dichloropropane	77173		
	Tetrachloroethene	34475		
	Dibromochloromethane	32105		
	1,2-Dibromomethane	77651		
	Chlorobenzene	34301		
	1,1,1,2-Tetrachloroethane	77362		
	Ethylbenzene	78113		
	meta,para-Xylene	85795		
	Styrene	77128		
	ortho-Xylene	77135		
	Isopropylbenzene	77223		
	Bromoform	32104		
	1,1,2,2-Tetrachloroethane	34516		
	1,1,3-Trichloropropane	77443		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
Condensate/leachate from holding tank (continued)	n-Propylbenzene	77224	Semi-annually	
	Bromobenzene	81555		
	1,3,5-Trimethylbenzene	77226		
	2-Chlorotoluene	77275		
	4-Chlorotoluene	77277		
	tert-Butylbenzene	77353		
	1,2,4-Trimethylbenzene	77222		
	sec-Butylbenzene	77350		
	p-Isopropyltoluene	77356		
	1,3-Dichlorobenzene	34566		
	1,4-Dichlorobenzene	34572		
	n-Butylbenzene	77342		
	1,2-Dichlorobenzene	34536		
	1,2-Dibromo-3-Chloropropane	38437		
	1,2,4-Trichlorobenzene	34551		
	Hexachlorobutadiene	34391		
	Naphthalene	34696		
	1,2,3-Trichlorobenzene	77613		
Leachate seeps	***SVOCs (Method 8260)***		Monthly (inspect for and sample if present)	
	2,4-Dimethylphenol	34606		
	Bis (2-chloroechoxy) methane	34278		
	2,6-Dichlorophenol	77541		
	1,2,4-Trichlorobenzene	34551		
	Naphthalene	34696		
	4-Chloroeniline	73529		
	Hexachlorobutadiene	34391		
	4-Chloro-3-methylphenol	34452		
	2-Methylnaphthalene	77416		
	Hexachlorocyclopentadiene	78022		
	1,2,4,5-Tetrachlorobenzene	77734		
	1-Chloronaphthalene	38687		
	4-Nitrophenol	34646		
	Pentachlorobenzene	77793		
	1-Naphthylamine	73600		
	2-Naphthylamine	73601		
	2,3,4,6-Tetrachlorophenol	77770		
	2,4,6-Trichlorophenol	34621		
	2,4,5-Trichlorophenol	77687		
	2-Chloronaphthalene	34581		
	2-Nitroaniline	76142		
	Acenaphthylene	34200		
	Dimethylphthalate	34531		
	2,6-Dinitrotoluene	34626		
	Acenaphthene	34205		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
Leachate seeps (continued)	3-Nitroaniline	78300	Monthly (inspect for and sample if present)	
	2,4-Dinitrophenol	34616		
	Dibenzofuran	81302		
	2,4-Dinitrotoluene	34611		
	Fluorene	34381		
	4-Chlorophenyl-phenyl ether	34641		
	Diethylphthalate	34336		
	4-Nitroaniline	73605		
	1,2-Diphenylhydrazine	34346		
	4,6-Dinitro-2-methylphenol	34657		
	4-Aminobiphenyl	77581		
	Diphenylamine	77579		
	Pentachloronitrobenzene	81316		
	N-nitrosodiphenylamine	34433		
	1-Bromophenyl-phenyl ether	34636		
	Hexachlorobenzene	39700		
	Pentachlorophenol	39032		
	Phenanthrene	34461		
	Anthracene	34220		
	Di-n-butylphthalace	39110		
	Fluoranthene	34376		
	Pyrene	34469		
	Benzidine	39120		
	p-(Dimothylamino) azobenzene	73558		
	Butylbenzylphthalate	77566		
	3,3'-Dichlorobenzidine	34631		
	Benzo (a) anthracene	34526		
	Chrysene	34320		
	Bis (2-ethylhexyl) phthalate	39100		
	Di-n-octylphthalate	34596		
	Benzo (b) fluoranthene	34230		
	Benzo (k) fluoranthene	34242		
	Benzo (a) pyrene	34247		
	Indeno (1,2,3-cd) pyrene	34403		
	Dibenzo (a,h) anthracene	34556		
	Benzo (g,h,i) perylene	34521		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
Leachate seeps (continued)	*VOCs (Method 8021):*			
	Benzene	34030	Monthly (inspect for and sample if present	
	Bromobenzene	81555		
	Bromochloromethane	77297		
	Bromodichloromethane	32101		
	Bromoform	32104		
	Bromomethane	34413		
	b-Butylbenzene	77342		
	sec-Butylbenzene	77350		
	tert-Butylbenzene	77353		
	Carbon Tetrachloride	32102		
	Chlorobenzene	34301		
	Chloroethane	34311		
	Chloroform	32106		
	Chloromethane	34418		
	2-Chlorotoluene	77275		
	4-Chlorotoluene	77277		
	Dibromochloromethane	32105		
	1,2-Dibromo-3-Chloropropane	38437		
	1,2-Dibromoethane	77651		
	Dibromomethane	77596		
	1,2-Dichlorobenzene	34536		
	1,3-Dichlorobenzene	34566		
	1,4-Dichlorobenzene	34571		
	Dichlorodifluoromethane	34668		
	1,1-Dichloroethane	34496		
	1,2-Dichloroethane	32103		
	1,1-Dichloroethene	34501		
	cis-1,2-Dichloroethene	77093		
	trans-1,2-Dichloroethene	34546		
	1,2-Dichloropropane	34541		
	1,3-Dichloropropane	77173		
	2,2-Dichloropropane	77170		
	1,1-Dichloropropene	77168		
	cis-1,3-Dichloropropane	34704		
	trans-1,3-Dichloropropane	34699		
	Ethylbenzene	78113		
	Hexachlorobutadiene	34391		
	Isopropylbenzene	77223		
	p-Isopropyltoluene	77356		
	Methylene chloride	34423		
	Naphthalene	34696		
	n-Propylbenzene	77224		
	Styrene	77128		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
Leachate seeps (continued)	1,1,1,2-Tetrachloroethane	77562	Monthly (inspect for and sample if present	
	1,1,2,2-Tetrachloroethane	34516		
	Tetrachloroethene	34475		
	Toluene	34010		
	1,2,3-Trichlorobenzene	77613		
	1,2,4-Trichlorobenzene	34551		
	1,1,1-Trichloroethane	34506		
	1,1,2-Trichloroethane	34511		
	Trichloroethane	39180		
	Trichlorofluoromethane	34488		
	1,2,3-Trichloropropane	77443		
	1,2,4-Trimethylbenzene	77222		
	1,3,5-Trimethylbenzene	77226		
	Vinyl Chloride	39175		
	ortho-Xylene	77135		
	meta,para-Xylene	85795		
	RCRA Metals dissolved (ICP):			
	Arsenic	01000		
	Copper	01040		
	Iron, total	74010		
	Lead	01049		
	Manganese	01056		
	Zinc	01090		
New Private Wells - Initial Sampling	Field pH	00400	As needed	New wells within sections 13, 14, 15, 22, 23, and 24 that are also within the SWCA. Perimeter wells identified as potentially impacted based on results from nearest wells.
	conductivity, temperature	00094,00010		
	Dissolved iron	01046		
	Dissolved manganese	01056		
	Total dissolved solids	00247		
	Hardness	00900		
	Alkalinity	00410		
	VOCs (Method 8021):			
	Dichlorodifluoromethane	34668		
	Chloromethane	34418		
	Vinyl chloride	39175		
	Bromomethane	34413		
	Chloroethane	34311		
	Trichlorofluoromethane	34488		
	1,1-Dichloroethene	34501		
	Methylene chloride	34423		
	MTBE	78032		
	trans-1,2-Dichloroethene	34546		
	Isopropyl ether	81577		
	1,1-Dichloroethane	34496		
	2,2-Dichloropropane	77170		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
New Private Wells - Initial Sampling (continued)	cis-1,2-Dichloroethene	77093	As needed	
	Chloroform	32106		
	Bromochloromethane	77297		
	1,1,1-Trichloroethane	34506		
	1,1-Dichloropropane	77168		
	Carbon Tetrachloride	32102		
	1,2-Dichloroethane	32103		
	Benzene	34030		
	Trichloroethene	39180		
	1,2-Dichloropropane	34542		
	Bromodichloromethane	32101		
	Dibromomethane	77596		
	cis-1,3-Dichloropropene	34704		
	Toluene	34010		
	trans-1,3-Dichloropropene	34699		
	1,1,2-Trichloroethane	34511		
	1,3-Dichloropropane	77173		
	Tetrachloroethene	34475		
	Dibromochloromethane	32105		
	1,2-Dibromomethane	77651		
	Chlorobenzene	34301		
	1,1,1,2-Tetrachloroethane	77362		
	Ethylbenzene	78113		
	meta,para-Xylene	85795		
	Styrene	77128		
	ortho-Xylene	77135		
	Isopropylbenzene	77223		
	Bromoform	32104		
	1,1,2,2-Tetrachloroethane	34516		
	1,1,3-Trichloropropane	77443		
	n-Propylbenzene	77224		
	Bromobenzene	81555		
	1,3,5-Trimethylbenzene	77226		
	2-Chlorotoluene	77275		
	4-Chlorotoluene	77277		
	tert-Butylbenzene	77353		
	1,2,4-Trimethylbenzene	77222		
	sec-Butylbenzene	77350		
	p-Isopropyltoluene	77356		
	1,3-Dichlorobenzene	34566		
	1,4-Dichlorobenzene	34571		
	n-Butylbenzene	77342		
	1,2-Dichlorobenzene	34536		

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
New Private Wells - Initial Sampling (continued)	1,2-Dibromo-3-Chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene	38437 34551 34391 34696 77613		
942 Alexander Road (BM127) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021) SVOCs (Method 8270)	- see New Private Wells - Initial Sampling. - see Leachate Seeps.	Quarterly - meter & influent Annually - effluent	shallow well with filter, within SWCA, early detection program TCE: ND-14 (5.3) ppb, PCE: ND-3.6 (1.5) ppb
881 E Highway 12 (BM123) Influent & Effluent Sample	VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Quarterly-meter & influent Annually-effluent	shallow well with filter, within SWCA TCE: 2-28 (28) ppb, PCE: ND-4.8 (ND) ppb
888 E Highway 12 (BM125) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Quarterly-meter & influent Annual - effluent	shallow well with filter, within SWCA TCE: 18-33 (20) ppb, PCE: ND-4.8 (ND) ppb
890 E Highway 12 (BM121) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Quarterly - meter & influent Annual - effluent	shallow well with filter, within SWCA TCE: 18-32 (21) ppb, PCE: ND-17 (ND) ppb
898 E Highway 12 (BM126) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Quarterly-meter & influent Semi-Annual-effluent	shallow well with filter, within SWCA TCE: 21-54 (27) ppb, PCE: ND (ND) ppb
772 Holden Lane (ET520) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Quarterly-meter Annually-influent & effluent	deep well with filter, within SWCA, monitor household usage, historically clean

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
953 LaBarge Road (BM093) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Quarterly-meter Annually-influent & effluent	shallow well with filter, monitor usage, within SWCA TCE: ND-12 (6.3) ppb, PCE: ND-3.4 (ND) ppb
892 E Highway 12 (EG667) *refused filter*	VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Semi-Annually	deep well, no filter, within SWCA historically clean
902 Alexander Road (BM122) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, outside SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
965 Alexander Road - Troop House (BM109) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-5.0 (ND) ppb, PCE: ND-12.0 (ND) ppb
965 Alexander Road - Caretaker (BM106) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-1.2 (ND) ppb, PCE: ND-2.1 (ND) ppb
965 Alexander Road - Day Camp (BM938) *refused filter*	VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well, no filter, within SWCA historically clean
947 Bakken Road (BM187) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 2.5-5.2 (4.7) ppb, PCE: ND-1.9 (ND) ppb
954 Bakken Road (EV036) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 2.1-3.6 (3.6) ppb, PCE: ND (ND) ppb

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
957 Bakken Road (BM181) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 1.9-4.2 (4.2) ppb, PCE: ND-2 (1.2) ppb
961 Bakken Road (BM177) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 2.1-4.3 (3.9) ppb, PCE: ND-1.9 (1.5) ppb
962 Bakken Road (BM188) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-4.6 (4.0) ppb, PCE: ND-1.2 (1.1) ppb
970 Bakken Road (BM180) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
888 Chippewa Path (FW646) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
920 Chippewa Path (FN534) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-0.54 (0.54) ppb, PCE: ND (ND) ppb
932 Chippewa Path (LK480) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
935 Chippewa Path (DE340) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb

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Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
928 County Rd A (FF473) Influent and Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 0.64 ppb, PCE: ND ppb
965 County Road A (BM118) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA historically clean
980 County Road A (ID968) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter ,within SWCA TCE: ND ppb, PCE: ND ppb
981 County Road A (ET519) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA historically clean
840 E Highway 12 (BM172) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
604 Grange Road (LK506) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
608 Grange Road (LK614) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
609 Grange Road (LK635) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
612 Grange Road (LK626) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
613 Grange Road (LK658) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
616 Grange Road (LK688) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
617 Grange Road (LK659) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
756 Holden Lane (BM152) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 5.8-9 (8.2) ppb, PCE: ND-3.8 (ND) ppb
766 Holden Lane (BM169) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-3.3 (ND) ppb, PCE: ND-1.4 (ND) ppb
767 Holden Lane (BM155) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA historically clean
779 Holden Lane (BM153) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	deep well with filter, within SWCA historically clean

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
780 Holden Lane (KM061) no structure yet - will build in 1997	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually (after home is built)	shallow well-filter planned, within SWCA TCE: 7.6 ppb, PCE: ND ppb
783 Holden Lane (FY087) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 7.6-9 (7.6) ppb, PCE: ND-1.1 (1.1) ppb
787 Holden Lane (FS648) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 7.0 ppb, PCE: 1.5 ppb
790 Holden Lane (IF920) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 4.8 ppb, PCE: ND ppb
792 Holden Lane (BM154) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 5.9-15 (5.9) ppb, PCE: ND-4.3 (0.97) ppb
875 Jane Circle (LF054) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, outside SWCA TCE: 1.0-1.5 (1.0) ppb, PCE: ND (ND) ppb
876 Jane Circle (EQ393) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, outside SWCA TCE: ND-0.75 (ND) ppb, PCE: ND (ND) ppb
877 Kingsway (KT721) Influent & Effluent Sample	Total gallons through GAC units, Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 4.8 ppb, PCE: ND ppb

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
878 Kingsway (IH248) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 1.0-33 (1.0) ppb, PCE: ND-1.5 (ND) ppb
881 Kingsway (EO132) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
882 Kingsway (LJ320) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND(ND) ppb
917 LaBarge Road (EZ382) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND-0.4 (ND) ppb
923 LaBarge Road Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND(ND) ppb, PCE: ND-0.4 (ND) ppb
929 LaBarge Road (BM146) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-1.5 (1.2) ppb, PCE: ND (ND) ppb
932 LaBarge Road (EL427) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 8.2-13 (8.2) ppb, PCE: 0.7-1.0 (1.0) ppb
940 LaBarge Road (BM119) Influent & Effluent Sample	Total gallons through GAC units, Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	deep well shared with 948, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
948 LaBarge Road (BM119) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	deep well shared with 940, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
949 LaBarge Road (LL649) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 7.0-7.9 (7.0) ppb, PCE: 0.22-0.51 (0.22) ppb
959 LaBarge Road (BM168) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 1-9.5 (7.4) ppb, PCE: ND-3.9 (ND) ppb
963 LaBarge Road (KK891) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 0.78 ppb, PCE: ND ppb
600 McCutcheon Road (LL624) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
671 McCutcheon Road (ET518) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-1.2 (0.55) ppb, PCE: ND (ND) ppb
677 McCutcheon Road (BM150) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-1.4 (0.83) ppb, PCE: ND (ND) ppb
690 McCutcheon Road (EV021) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA historically clean

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
692 McCutcheon Road (KW919) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND ppb, PCE: ND ppb
695 McCutcheon Road (EG650) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter ,within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
696 McCutcheon Road (BM149) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter ,within SWCA TCE: ND-2.9 (2.8) ppb, PCE: ND-1.6 (1.6) ppb
704 McCutcheon Road Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually, if permitted	shallow well with filter, within SWCA TCE: 1-2.4 ppb, PCE: ND ppb
712 McCutcheon Road (BM167) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter ,within SWCA TCE: ND-1.1 (1.1) ppb ,PCE: ND (ND) ppb
718 McCutcheon Road (BM265) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 1.7 ppb, PCE: ND ppb
756 McCutcheon Road (KK887) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter ,within SWCA TCE: 1.7 ppb , PCE: ND ppb
757 McCutcheon Road (EV023) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-1.9 (1.9) ppb, PCE: ND (ND) ppb

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
758 McCutcheon Road (KW889) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter ,within SWCA TCE: ND-8.6 (6.0) ppb, PCE: ND (ND) ppb
763 McCutcheon Road (BM166) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-8.6 (6.0) ppb, PCE: ND (ND) ppb
767 McCutcheon Road (KW890) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 6.1 ppb, PCE: ND ppb
771 McCutcheon Road (BM112) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	deep well with filter, within SWCA historically clean
775 McCutcheon Road (BM111) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-4 (2.7) ppb, PCE: ND-2 (ND) ppb
783 McCutcheon Road (BM120) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-3.6 (3.6) ppb, PCE: ND-2.4 (1.4) ppb
786 McCutcheon Road (ID990) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 0.72 ppb, PCE: ND ppb
794 McCutcheon Road (FO582) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 2.6-5.6 (4.1) ppb, PCE: ND-0.99 (0.99) ppb

Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
795 McCutcheon Road (BM162) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 1.6-7.4 (7.1) ppb, PCE: 1.5-4.5 (1.5) ppb
812 McCutcheon Road (BM158) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	deep well with filter, within SWCA historically clean
832 McCutcheon Road (Windy Acres) (BM107) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: 1.4-2.9 (2.3) ppb, PCE: ND-2.5 (1.2) ppb
720 Norflex Drive (FY778) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, outside SWCA TCE: 1.6 ppb, PCE: ND ppb
977 Scott Road (KS649) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND, PCE: ND
985 Scott Road (EV011) Influent & Effluent Sample	Total gallons through GAC units , Total coliform(influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
993 Scott Road (BM114) *will install filter if well becomes contaminated*	VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well, no filter, within SWCA historically clean
981 Tanney Lane (BM148) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-5 (4.8) ppb, PCE: ND-1.1 (ND) ppb

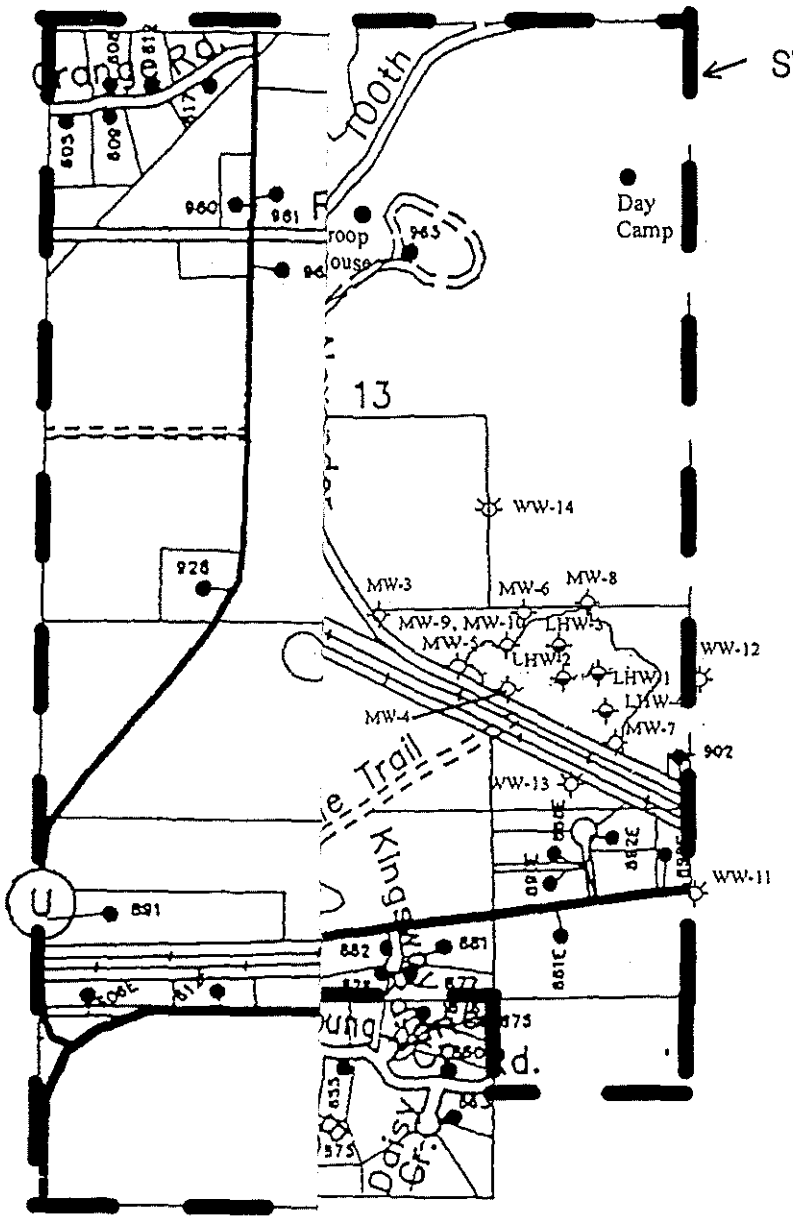
Table 4.2
Monitoring Program
Former Junker Landfill, Town of Hudson, WI

Quarterly monitoring and maintenance activities should be performed in January, April, July and October while semi-annual events occur in January and July, unless otherwise approved by the WDNR.

Well Location	Analysis	Parameter Numbers	Frequency	Historical Info & Sampling Rationale
982 Tanney Lane (BM185) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA, TCE: 5.7 ppb, PCE: ND ppb,
994 Tanney Lane (EV017) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA, TCE: ND ppb, PCE: ND ppb
997 Tanney Lane (DF399) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
998 Tanney Lane (BM182) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA historically clean
1001 Tanney Lane (FS077) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND (ND) ppb, PCE: ND (ND) ppb
848 Yellowstone Trail (BM128) Influent & Effluent Sample	Total gallons through GAC units , Total coliform (influent) VOCs (Method 8021)	- see "New Private Wells - Initial Sampling"	Annually	shallow well with filter, within SWCA TCE: ND-1.3 (ND) ppb, PCE: ND-2.1 (ND) ppb

Notes:

TCE and PCE concentrations: Historical information is presented as a range. The 1996 sampling event is presented in parentheses, or by itself if no historical data were available. Historically clean means none of the organic chemicals listed on the EPA Method 8021 were detected. Individuals who did not respond to the offer of a filter system "no response" or declined a filter were notified that a deed affidavit would be filed on their property to notify future homeowners of the opportunity.



FORMER JUNKER LANDFILL
TOWN OF HUDSON, WISCONSIN

FIGURE 4-1
MONITORING POINTS

DAMES & MOORE

DATE: 3-17-97

PROJECT No.: 33178-002

5.0 MONITORING RESULTS TO DATE

Initial system monitoring was conducted by SEH on October 22, 1997. AllPhase Companies, Inc., assumed the OM&M responsibilities for the landfill on November 4, 1997.

5.1 GAS EXTRACTION SYSTEM RESULTS TO DATE

Three additional gas extraction wells were added to the system during the construction phase of the project. GEW-19 was brought on-line on November 4, 1997. GEW-20 and GEW-21 had higher levels of oxygen detected initially, so an investigation into the source of the oxygen was conducted. Because the wells also have leachate pumping capabilities, it was determined that the oxygen was coming from the pump apparatus and/or the electrical conduit. Silicone caulking was used to seal the base of the riser pipe protruding from the well and the electrical conduit lines. Oxygen levels at these wells dropped below one percent, and the wells were slowly brought into service, beginning December 16, 1997. All other gas extraction wells that were operating before the construction project, were brought back into service without incident. Methane levels at the blower have ranged from 48 percent to 56 percent since startup of the system (See Table 5.1).

5.2 GAS PROBE MONITORING RESULTS

The data collected by SEH on October 7, 1997, previous to startup, indicate landfill gas migration offsite, toward the south/southeast. The methane levels in the south perimeter probes continued to increase throughout the system shutdown. AllPhase measured the methane levels in the south perimeter probes in December. Methane levels detected after startup of the gas extraction system decreased in all probes, except in GMW-6M and GMW-7 which had methane concentrations similar to concentrations before startup. GMW-6M is across from GEW-20 and GEW-21 (as well as GEW-8 and GEW-9). The methane presence in GMW-6M is reasonable because GEW-20 and GEW-21 were not activated until recently. The gas probe results are shown in Table 5.2.

5.3 GROUNDWATER MONITOR WELL SAMPLING RESULTS

The fourth quarter groundwater sampling was conducted by SEH. Results of this round of groundwater sampling indicate a slight rise in the TCE concentrations at the homes near the landfill (See Table 5.3). This increase is well within the historical concentrations at the wells.

5.4 LEACHATE EXTRACTION SYSTEM RESULTS TO DATE

Gas extraction wells GEW-19, GEW-20, and GEW-21 were installed July 2 and 3, 1997. The boring logs (Appendix C) indicate GEW-19 was installed through dry municipal waste materials. GEW-20 and GEW-21 were both logged as Moist or Wet and were installed in municipal waste and construction demolition materials. The waste materials encountered during drilling of GEW-20 and GEW-21 appeared very wet compared to GEW-19. Therefore, at the time of drilling, there was no reason to suspect the wells would not produce significant leachate. Because of the high moisture levels in the drill cuttings, the leachate level in the wells was not measured; it was assumed to be similar to those found in GEW-7, 8, 9, 10, and LEW-1, near where GEW-20 and GEW-21 are located. The leachate pumping test indicated that very low flow conditions were present at the landfill. Therefore, it was reasonable that leachate levels in the wells immediately following installation would be low, and the flow to the wells could be discontinuous. Because of these conditions, the electrical piston pumps were chosen over the submersible pumps because of their proven performance in landfill environments. Wells GEW-7, 8, 9, and 10 all have functioning submersible electrical pumps. Therefore, the piston pumps were not moved to any of those locations. Other wells in the landfill with appreciable leachate levels would require significant changes to tie into the leachate pumping system (electrical connection and well head assembly modification). However, if one of the submersible pumps installed in GEW-7, 8, 9, or 10 fail, a piston pump should be moved to that location.

The lack of sufficient leachate to remove by pumping at GEW-20 and GEW-21 proves that the landfill contains less leachate than originally estimated in the RI/FS. The disparity in leachate head levels at wells near each other show that isolated "pockets" of leachate are present where low permeability materials (e.g. sludge) was placed during active operations. This sludge material was encountered during installation of LEW-1.

The leachate tank was pumped dry prior to startup of the gas and leachate extraction system. Approximately 3,327 gallons were pumped from the tank on October 22, 1997, just two days after the system was initially started. An additional 2,175 gallons of leachate were removed from the tank on November 26, 1997; 3,606 gallons on January 5, 1998; and 2,961 gallons on February 19, 1998. Leachate levels in the wells nearest the leachate extraction system have decreased since startup of the leachate extraction system. Levels measured in early October show 2.86 to 10.15 feet of leachate thickness in this area. After startup, leachate levels in the wells dropped below 2 feet in all wells, except GEW-9, which had 4.45 feet of leachate. (See Table 5.4). The actual levels of leachate in this area may be higher than the numbers indicate. Every well in the area (GEW-7, GEW-8, GEW-9, GEW-10, LEW-1, GEW-20 and GEW-21) has a pump. It may take time to recharge the wells, so an increase in leachate levels may be observed.

Both the decrease in off-site landfill gas migration and the leachate thickness in the landfill indicate the project is working as intended. Because the mass of leachate is smaller than originally thought, leachate should be withdrawn in a shorter time period, and groundwater should be restored in a shorter duration as well. Monitoring over the course of the next year will continue the review and assessment of the project's effectiveness.

Table 5.1
Gas Extraction System
Former Junker Sanitary Landfill, Town of Hudson, Wisconsin

Date	Ambient Temp (F)	Barometric Pressure & Trend	Header Line Vacuum (in water)	Blower Inlet Vacuum (in water)	Blower Discharge Pressure (in. water)	Pressure (in. water)	Temp (F)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Balance (%)	Velocity (ft/min)	Total Gas Flow (ft^3/min)
06/24/97	75	29.76 F	-10.10	-29.0	+0.42	-0.07	105	46.9	35.3	0.1	17.7	867	170
10/22/97	39	30.16 R	-10.30	-28.5	+1.83	-0.03	82	42.5	29.4	4.7	23.4	1571	308
11/12/97	31	30.03 S	-12.0	-29.0	+1.50	0.0	82	56.8	37.3	0.1	3.8	1700	333.2
11/19/97	23	29.98 F	-13.0	-28.0	1.20	0.0	79	55.6	36.1	0.1	3.8	1800	313.6
11/26/97	47	29.95 R	-13.0	-29.0	0.80	0.0	84	52.2	36.8	0.3	10.7	1700	333.2
12/04/97	30	29.83 R	-13.0	-29.0	1.00	0.0	83	49.9	36.5	0.2	13.4	1700	333.2
12/11/97	35	30.23	-15.0	-29.0	0.80	0.0	79	48.0	35.2	0.2	16.6	1500	294

Table 5.2
South Perimeter Gas Monitoring Wells
Junker Sanitary Landfill, Town of Hudson, Wisconsin

Date	Well I.D.	Ambient Temp (F)	Barometric Pressure & Trend	Pressure (Inches of water)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Balance (%)
10/07/97	GMW-5S	64	29.95 F	+0.07	16.2	21.8	0.3	61.7
12/16/97	GMW-5S	43	29.95 S	+0.09	0.5	2.5	18.5	78.5
10/07/97	GMW-5M	64	29.95 F	+0.11	6.5	14.8	6.1	72.6
12/16/97	GMW-5M	43	29.95 S	+0.09	0.0	1.4	19.9	78.7
10/07/97	GMW-5D	64	29.95 F	+0.15	18.7	24.7	0.2	56.4
12/16/97	GMW-5D	43	29.95 S	+0.08	0.0	1.4	20	78.6
10/07/97	GMW-6S	64	29.95 F	+0.07	46.7	35.1	0.2	18.0
12/16/97	GMW-6S	43	29.95 S	+0.03	0.0	0.2	20.6	79.2
10/07/97	GMW-6M	64	29.95 F	+0.17	58.6	38.6	0.2	2.6
12/16/97	GMW-6M	43	29.95 S	+0.03	54.2	35.8	5	4
10/07/97	GMW-6D	64	29.95 F	+0.16	39.7	35.0	0.2	25.1
12/16/97	GMW-6D	43	29.95 S	+0.08	0.0	0.3	20.7	79.0
10/07/97	GMW-7	64	29.95 F	+0.12	48.5	36.0	0.2	15.3
12/16/97	GMW-7	43	29.95 S	-0.05	50.0	46.4	0.8	2.6
10/07/97	GMW-8S	64	29.95 F	+0.02	43.2	33.6	0.5	22.7
12/16/97	GMW-8S	43	29.95 S	0.0	0.0	3.5	17.1	79.4
10/07/97	GMW-8M	64	29.95 F	+0.03	5.1	7.9	13.4	73.6
12/16/97	GMW-8M	43	29.95 S	0.0	0.0	0.5	20.1	79.5
10/07/97	GMW-8D	64	29.95 F	+0.11	1.0	5.6	14.6	78.8
12/16/97	GMW-8D	43	29.95 S	0.0	0.0	1.1	19.4	79.6
10/07/97	GMW-9	64	29.95 F	+0.15	36.9	18.7	0.2	44.2
12/16/97	GMW-9	43	29.95 S	0.0	1.9	6.4	2.8	88.9
10/07/97	GMW-10	64	29.95 F	+0.12	0.0	6.7	1.0	92.3
12/16/97	GMW-10	43	29.95 S	00	0.0	0.2	20.4	79.4

Table 5.3
Groundwater Monitoring Wells
Former Junker Sanitary Landfill, Town of Hudson, Wisconsin
Concentrations as µg/L, unless otherwise noted

Well	Date	TCE	PCE	1,1,1-TCA	1,1-DCA	cis-1,2-DCE	TCFM	DCDFM	Chloro ethane	Benzene	Vinyl Chloride	Toluene
MW-3	10/8/97	12	1.2	0.38	0.89	0.21	3.5	ND	ND	ND	ND	ND
MW-4	10/8/97	0.70	0.88	ND	1.2	0.46	1.2	ND	ND	ND	ND	ND
MW-5	10/8/97	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6	10/8/97	0.96	0.34	ND	1.7	1.0	ND	ND	0.22	1.0	1.1	ND
MW-7	10/8/97	7.6	0.42	ND	ND	0.30	ND	ND	ND	ND	ND	ND
MW-8	10/8/97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-9	10/8/97	5.6	0.46	ND	0.30	0.34	ND	ND	ND	ND	ND	ND
MW-10	10/8/97	1.5	1.1	0.64	0.42	ND	ND	ND	ND	ND	ND	ND
MW-11	10/8/97	1.8	0.20	ND	ND	ND	0.80	ND	ND	ND	ND	ND
MW-12	10/8/97	6.2	1.4	1.3	ND	ND	ND	ND	ND	ND	ND	ND
MW-13	10/8/97	22	2.0	0.60	ND	ND	4.0	1.4	ND	ND	ND	ND
MW-14	10/8/97	1.0	2.0	0.54	ND	ND	1.8	ND	ND	ND	ND	0.46
MW-15A	10/8/97	2.1	ND	ND	ND	ND	0.74	ND	ND	ND	ND	ND

Well	Date	TCE	PCE	1,1,1-TCA	1,1-DCA	cis-1,2-DCE	TCFM	DCDFM	Chloro ethane	Benzene	Vinyl Chloride	Toluene
MW-15B	10/8/97	7.0	0.58	ND	ND	ND	1.2	ND	ND	ND	ND	ND
MW-15C	10/8/97	6.7	0.74	0.23	ND	ND	ND	ND	ND	ND	ND	2.3
MW-16	10/8/97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BM-127[1]	10/8/97	ND	0.63	0.76	ND	ND	6.3	ND	ND	ND	ND	ND
BM-126[2]	10/8/97	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BM-123[3]	10/8/97	31	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND
BM-125[4]	10/8/97	25	0.94	ND	ND	ND	1.1	ND	ND	ND	ND	ND

Notes:
TCE: Trichloroethene
PCE: Tetrachloroethene
1,1,1-TCA: 1,1,1-Trichloroethane
1,1-DCA: 1,1-Dichloroethane
cis-1,2-DCE: cis-1,2-Dichloroethene
TCFM: Trichlorofluoromethane
DCDFM: Dichlorodifluoromethane

[1]: Private Well at 942 Alexander Road
[2]: Private Well at 898 E. Highway 12
[3]: Private Well at 881 E. Highway 12
[4]: Private Well at 888 E. Highway 12

Table 5.4
Leachate Head Levels
Junker Sanitary Landfill, Town of Hudson, Wisconsin

Date	LHW -1	LHW -2	LHW -3	LHW -4	LEW -1	GEW -1	GEW -2	GEW -3	GEW -4	GEW -5	GEW -6	GEW -7	GEW -8
10/07/97	4.55	1.50	0.05	2.86	NA	0.20	0.00	1.37	0.00	0.31	0.00	10.15	6.28
12/11/97	4.79	0.95	0.0	3.3	NA	0.54	<0.35	2.29	<0.35	0.35	<0.35	<0.35	<0.35

Date	GEW -9	GEW -10	GEW -11	GEW -12	GEW -13	GEW -14	GEW -15	GEW -17	GEW -18	GEW -19	GEW -20	GEW -21
10/07/97	6.42	3.47	NA	0.58	1.09	0.09	0.22	0.16	0.17	NA	NA	NA
12/11/97	4.45	<0.35	<0.35	0.79	0.35	<0.35	0.40	<0.35	0.35	NA	<0.35	<0.35

NA: Leachate levels were not available for these wells.
GEW-19 did not have a leachate measurement port installed. AllPhase has agreed to tap a leachate port on the well, effective March 1998.

APPENDIX A

PRECONSTRUCTION MEETING AGENDA AND MINUTES

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

2701 International Lane
Suite 210
Madison, WI 53704
608 244-1788 Tel
608 244-7823 Fax

Memo

Action DPT Info File 33178-003

From JAH

Date 06-09-97

Subject PRE-CONSTRUCTION MEETING MINUTES

Meeting was held at the former Junker Landfill, June 5, 11:00 a.m.

Staging of Construction: Ditch grading and gas extraction wells will begin June 23. Piping and subsidence regrade will begin late week of June 23 or week of June 30.

Clay Source Specs - Wyatt of Frattalone will give info to D&M.

Ditch Details: Confirm provided elevation of culvert by survey.
Any excess soil removed from the ditch may be used as clean fill in the excavated waste area. Fill over and above the excavation volume will be placed in a location on the landfill (decide later).

Well pumps: Piston pumps - determine setpoint by electric timer - Terra must perform these duties as a part of the startup activities. Also - specs say 3 phase when the supplied power is single phase.

Electric pumps - Terra took 4 well pumps from site to test operability.

SEH must be notified regarding shutting down the gas extraction system. I spoke with Brian Kent and he thought we should shut down the system as soon as we start pulling back the cap materials, because the nearby gas wells would start drawing surface air into the system. He will discuss with Frank and get back to us.

Utility pole - must be moved onto the landfill property. Move about 20 feet north of fenceline. This will get it out of the way of the ditch grading activities.

The landfill should be mowed the week of June 16 to prepare for construction activities.

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION OF CONSTRUCTION ACTIVITIES

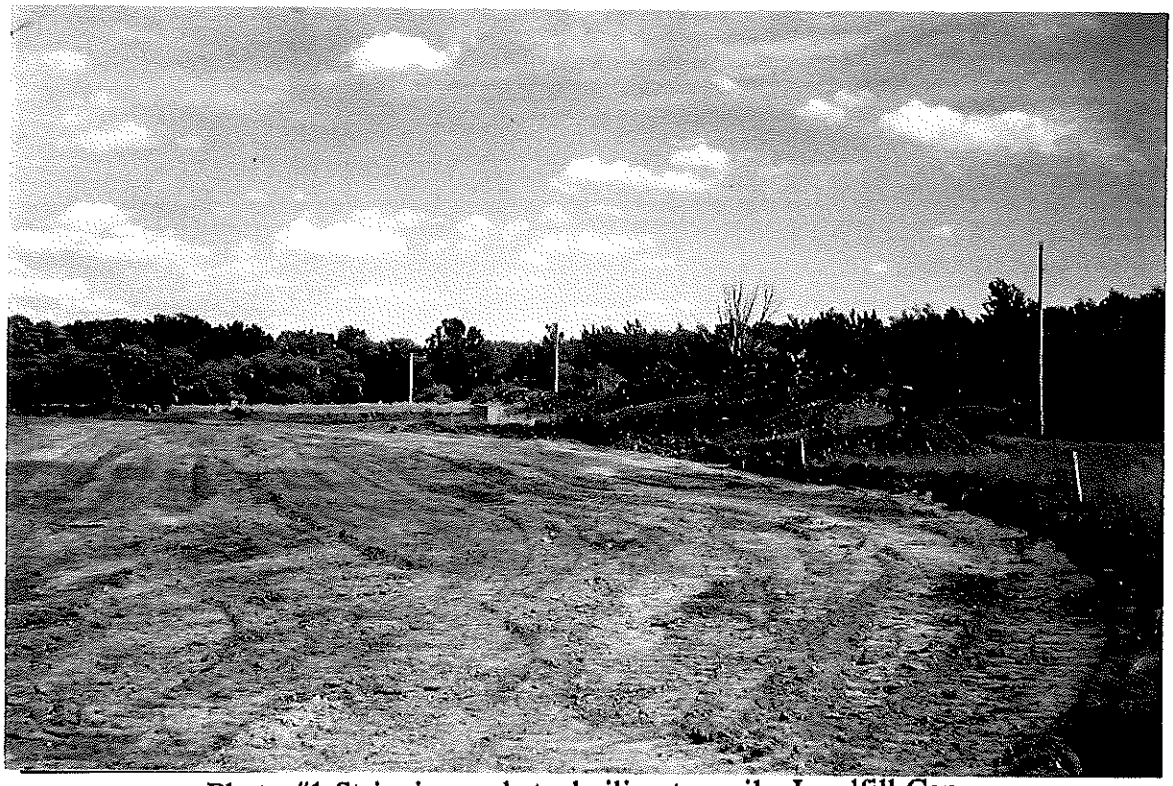


Photo #1 Stripping and stockpiling topsoil - Landfill Cap

Photo #2 Rainwater collecting in subsidence area - Landfill Cap

Photo #3 Installing submersible pump for rainwater removal - Landfill Cap

Photo #4 Stripping clay from subsidence areas - Landfill Cap

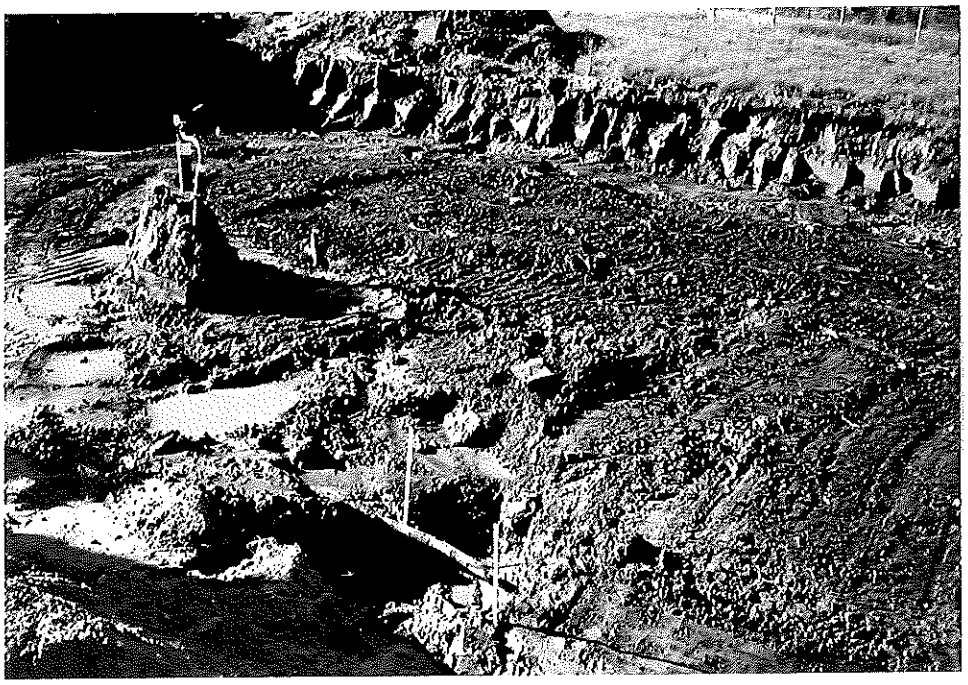


Photo #5 Broken lateral piping to GEW-13 - Landfill Cap

Photo #6 Spreading solid waste excavated from uncapped areas - Landfill Cap

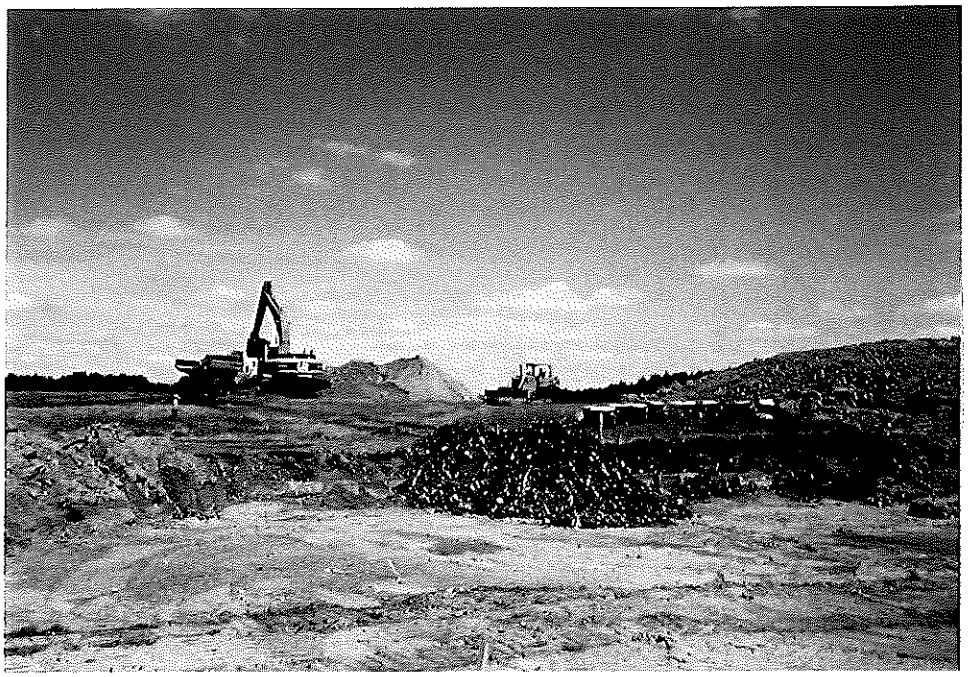


Photo #7 Preparing to spread solid waste in subsidence area - Landfill Cap

Photo #8 Spreading solid waste and drums from drilling activities - Landfill Cap

Photo #9 Stockpiling solid waste in subsidence area - Landfill Cap

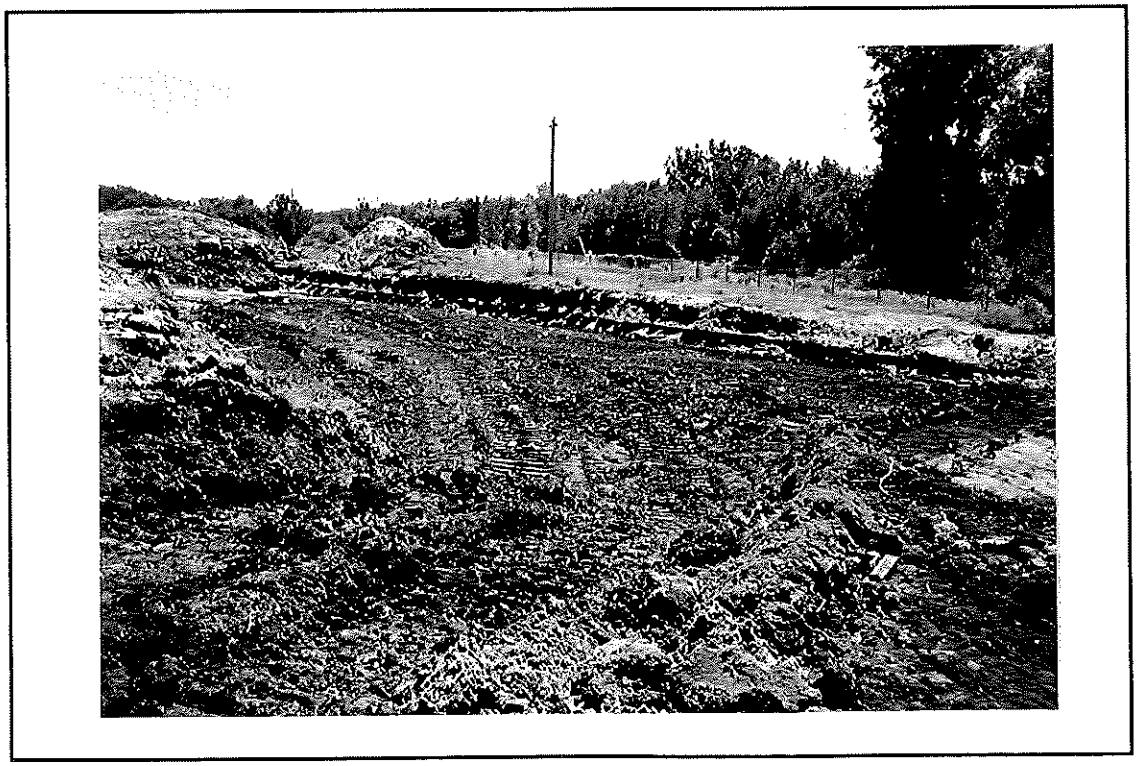


Photo #10 Spreading clay over solid waste - Landfill Cap

Photo #11 Placing and compacting clay - Landfill Cap

Photo #12 Placing and compacting clay - Landfill Cap

Photo #13 Excavating uncapped solid waste area - north of Landfill Cap

Photo #14 - Uncapped solid waste area - north of Landfill Cap

Photo #15 Gas/Leachate extraction well screen - Landfill Cap

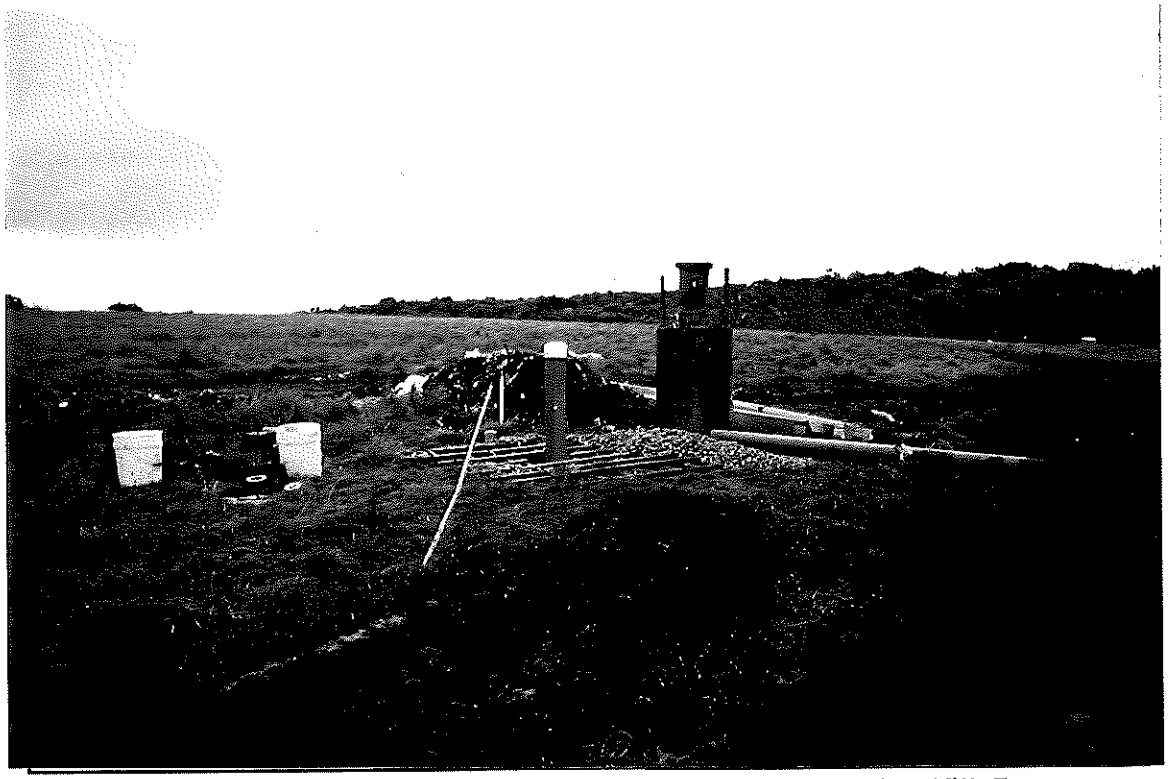


Photo #16 GEW-19 installation and backfill complete - Landfill Cap

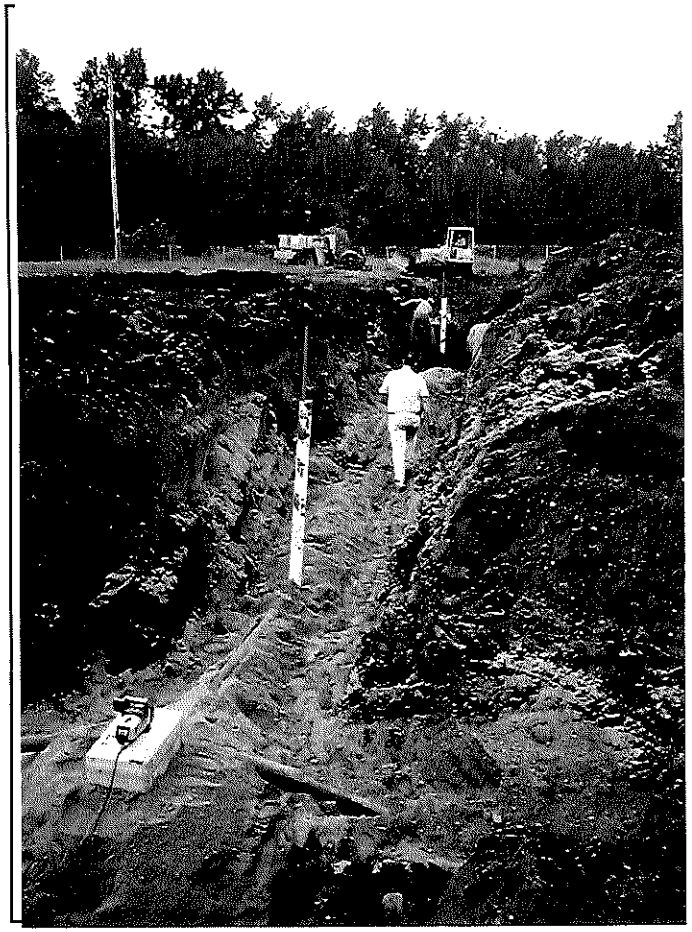


Photo #21 Installing vacuum monitoring boxes - Landfill Cap

Photo #22 Installing lateral piping to GEW-20 - Landfill Cap

Photo #23 Adding tee to existing lateral piping for connection to new well- Landfill Cap

Photo #24 Trenching to LEW-1 for lateral pipe connection - Landfill Cap

Photo #25 Screen for Leachate Extraction Piston Pumps - Landfill Cap

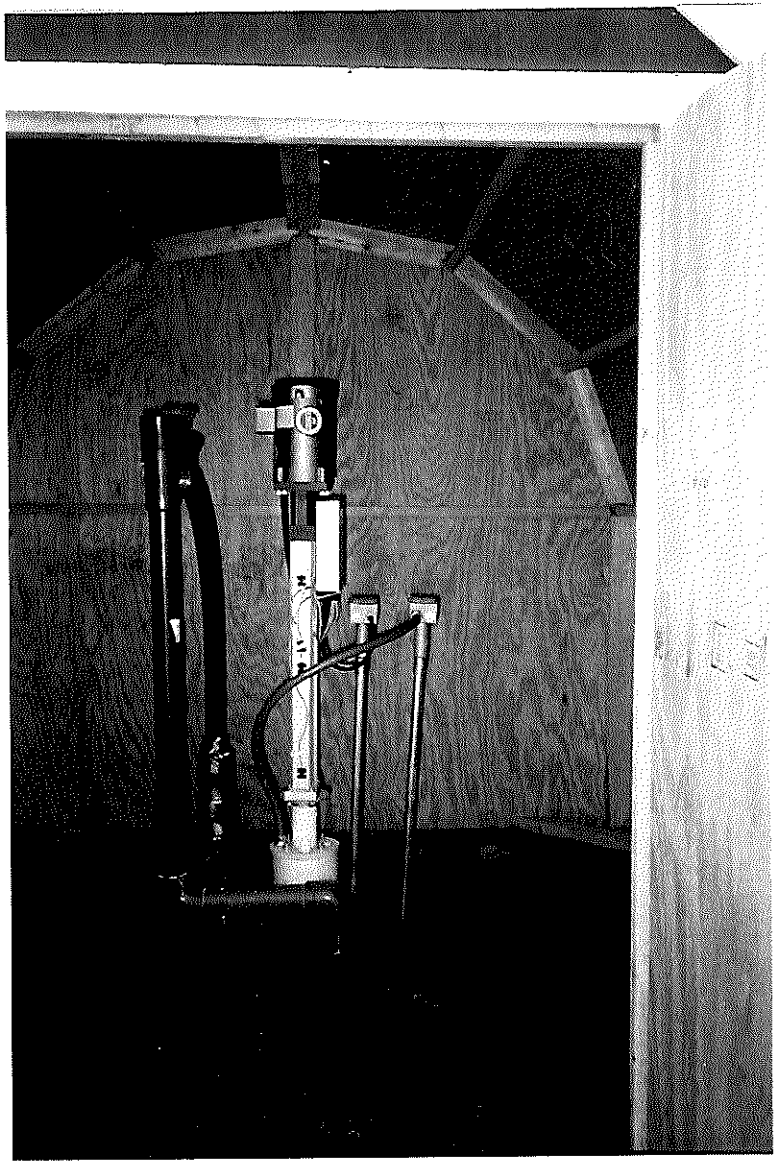


Photo #26 Completed Leachate and Gas Extraction Well Assembly - Landfill Cap

Photo #27 Removing Soils for Regrading - South Perimeter Ditch

Photo #28 Completed soil removal of west end of ditch - South Perimeter Ditch

Photo #29 Solid waste removed from ditch near western manhole - South Perimeter Ditch

Photo #30 Removal of surface soils in western ditch complete - South Perimeter Ditch

Photo #31 Removal of surface soils near eastern end of ditch - South Perimeter Ditch

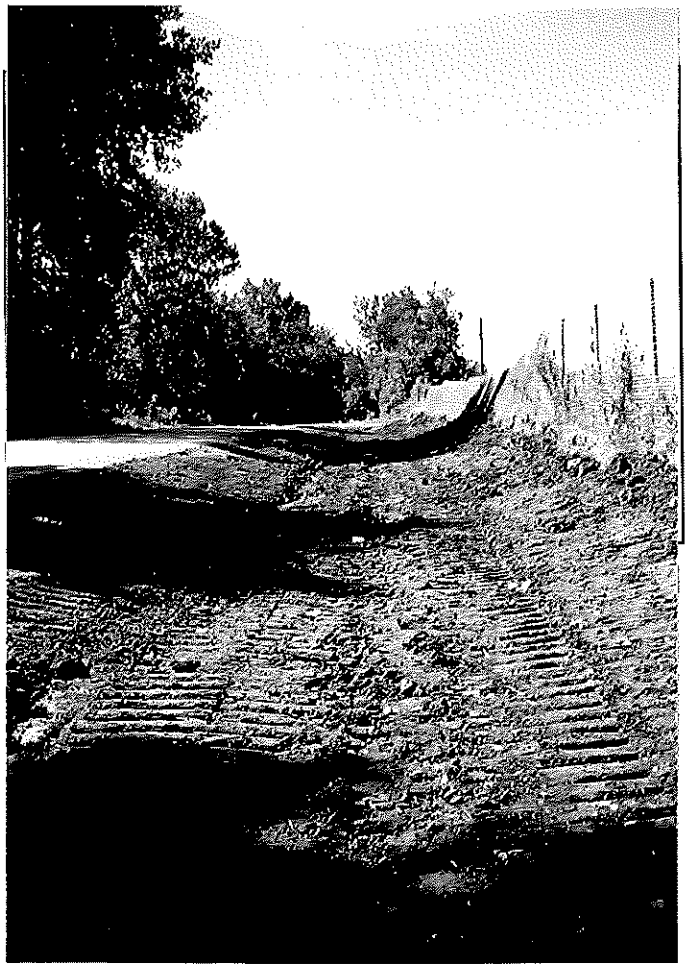


Photo #32 Completed clay compaction and topsoil replacement - South Perimeter Ditch

Photo #33 Seeding and mulching and fence restoration complete - South Perimeter Ditch

APPENDIX C

GAS/LEACHATE WELL CONSTRUCTION FORMS

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Junker Landfill	Local Grid Location of Well: _____ ft. ☐N. ☐S. _____ ft. ☐E. ☐W.	Well Name: GEW - 19
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. _____ Long. _____ or	Wis. Unique Well Number / DNR Well Number: _____ / _____
Type of Well: Gas well — Water Table Observation Well ☐ 11; Piezometer ☐ 12	St. Plane _____ ft. N, _____ ft. E.	Date Well Installed: 07 / 02 / 97 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary: in waste ft.	Section Location of Waste/Source: SE 1/4 of SE 1/4 of Sec. 13 T. 29 N, R. 19 ☐E. ☐W.	Well Installed By: (Person's Name and Firm): Steve Smith / Terra Engineering & Constr.
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation 1026.12 ft. MSL
C. Land surface elevation 1023.1 ft. MSL
D. Surface seal, bottom 1015.6 ft. MSL or 7.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☐ 41; caisson; Other ☒

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis):
_____

E. Bentonite seal, top _____ ft. MSL or _____ ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1015.6 ft. MSL or 7.5 ft.
H. Screen joint, top 1015.6 ft. MSL or 7.5 ft.
I. Well bottom 972.1 ft. MSL or 51.0 ft.
J. Filter pack, bottom 971.6 ft. MSL or 51.5 ft.
K. Borehole, bottom 971.6 ft. MSL or 51.5 ft.
L. Borehole, diameter 36.0 in.
M. O.D. well casing 6.63 in.
N. I.D. well casing 5.76 in.

1. Cap and lock? ☐ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: N/A in.
b. Length: N/A ft.
c. Material: Steel ☐ 04; Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ _____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☐ 32
c. N/A Other ☐ _____
7. Fine sand material: Manufacturer, product name & mesh size
a. N/A
b. Volume added - ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. 1-2" washed stone
b. Volume added 301 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ _____
10. Screen material: _____
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.040 in.
d. Slotted length: _____ ft.
11. Backfill material (below filter pack): None ☒ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

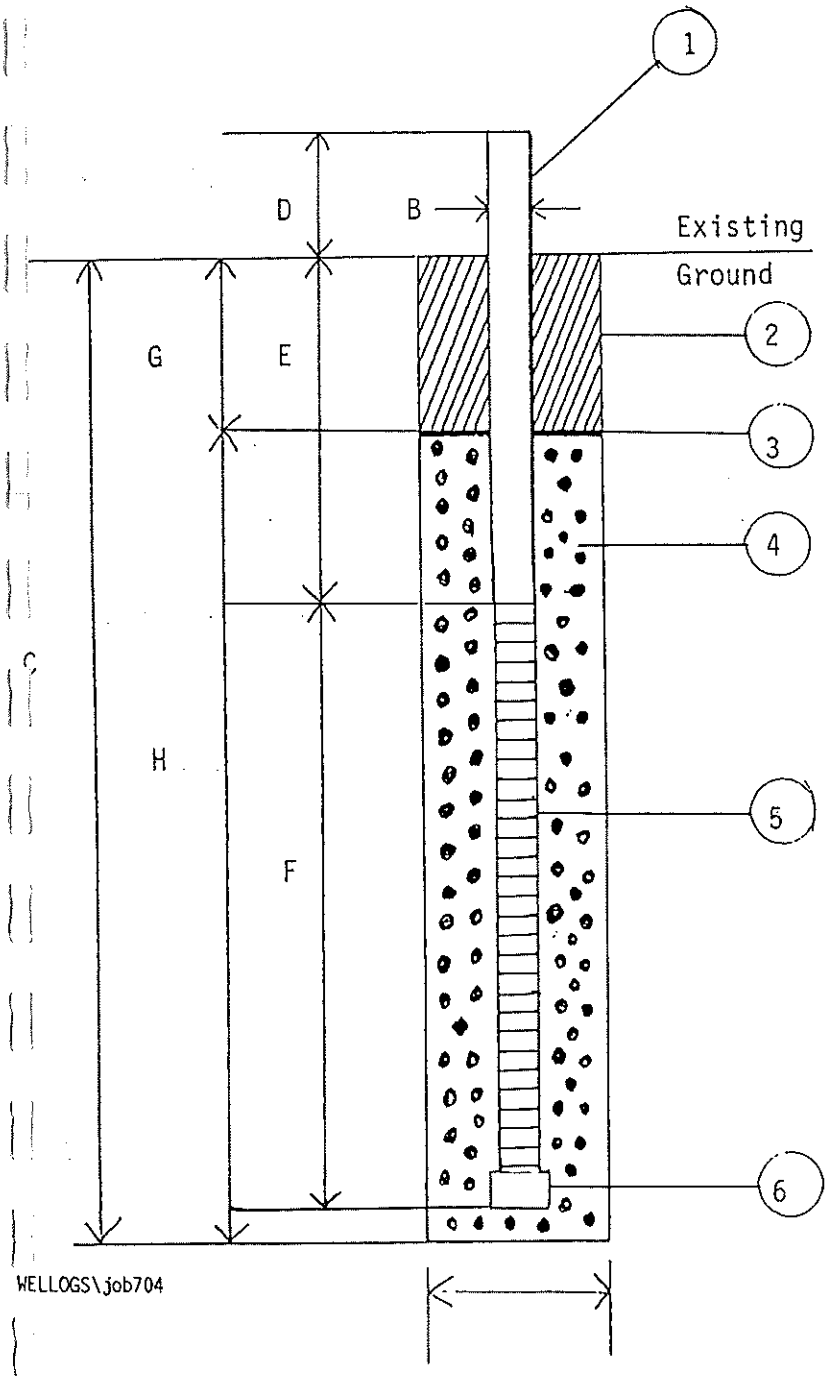
GAS EXTRACTION WELL
DESIGN/AS-BUILT

SITE Junker LFG Migration Control

DRILLING DATE July 2, 1997

WELL NO. GEW 19

WELL COORDINATES _____



MATERIAL LIST

1) SCH 80 PVC PIPE
2) GRANULAR BENTONITE
3) MIRAFI 600X GEOTEXTILE
4) 1-2" WASHED STONE
5) SCH 80 PVC FACTORY SLOTTED .040" PIPE
6) PVC SCH 80 CAP

SPECIFICATIONS

A) BORE SIZE	36	IN.
B) PIPE SIZE	6	IN.
C) BORE DEPTH	51.5	FT.
D) SOLID PIPE ABOVE GROUND	3	FT.
E) SOLID PIPE BELOW GROUND	7.5	FT.
F) SLOTTED PIPE LENGTH	43.5	FT.
G) UPPER BENTONITE SEAL	7.5	FT.
H) WASHED STONE PACK	44	FT.
DEPTH TO REFUSE	12	FT.

NOTES: _____

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Junker Landfill	Local Grid Location of Well: _____ ft. ☐N ☐S, _____ ft. ☐E ☐W	Well Name: GEW - 20
Facility License, Permit or Monitoring Number: _____	Grid Origin Location: Lat. ____ ____ ____ Long. ____ ____ ____ or	Wis. Unique Well Number / DNR Well Number
Type of Well: Water Table Observation Well ☐ 11; gas well; Piezometer ☐ 12	St. Plane _____ ft. N, _____ ft. E.	Date Well Installed: 07 / 03 / 97 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary: in waste ft.	Section Location of Waste/Source: SE 1/4 of SE 1/4 of Sec. 13, T. 29 N, R. 19 ☐E ☐W	Well Installed By: (Person's Name and Firm): Steve Smith; Terra Engineering & Constr.
Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient; d ☐ Downgradient n ☐ Not Known	

A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation 1027.68 ft. MSL
C. Land surface elevation 1024.7 ft. MSL
D. Surface seal, bottom 1017.2 ft. MSL or 7.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

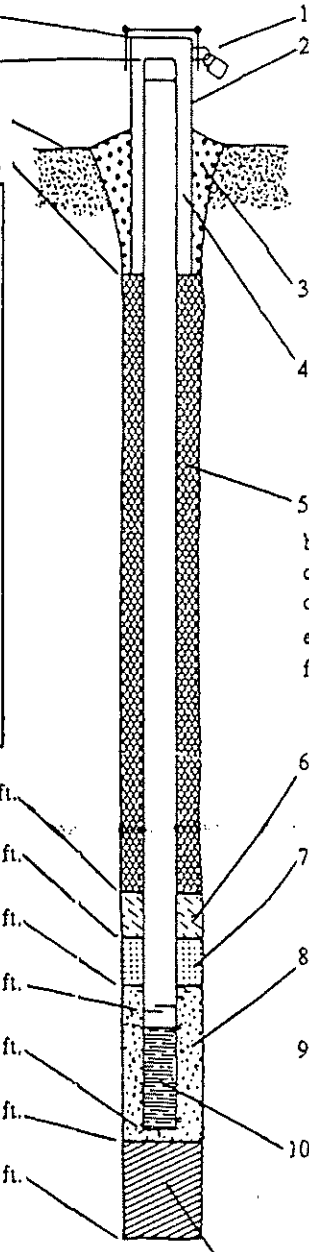
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☐ 41; caisson; Other ☒

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis):
_____

E. Bentonite seal, top _____ ft. MSL or _____ ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1017.2 ft. MSL or 7.5 ft.
H. Screen joint, top 1017.2 ft. MSL or 7.5 ft.
I. Well bottom 960.9 ft. MSL or 63.8 ft.
J. Filter pack, bottom 960.4 ft. MSL or 64.3 ft.
K. Borehole, bottom 960.4 ft. MSL or 64.3 ft.
L. Borehole, diameter 36.0 in.
M. O.D. well casing 6.63 in.
N. I.D. well casing 5.76 in.



1. Cap and lock? ☐ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: N/A in.
b. Length: N/A ft.
c. Material: Steel ☐ 04; Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ _____
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☐ _____; Other ☐ _____
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☐ 32
c. N/A Other ☐ _____
7. Fine sand material: Manufacturer, product name & mesh size
a. N/A
b. Volume added _____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. 1-2" washed stone
b. Volume added 388 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23; Flush threaded PVC schedule 80 ☒ 24; Other ☐ _____
10. Screen material: _____
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.040 in.
d. Slotted length: _____ ft.
11. Backfill material (below filter pack): None ☒ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

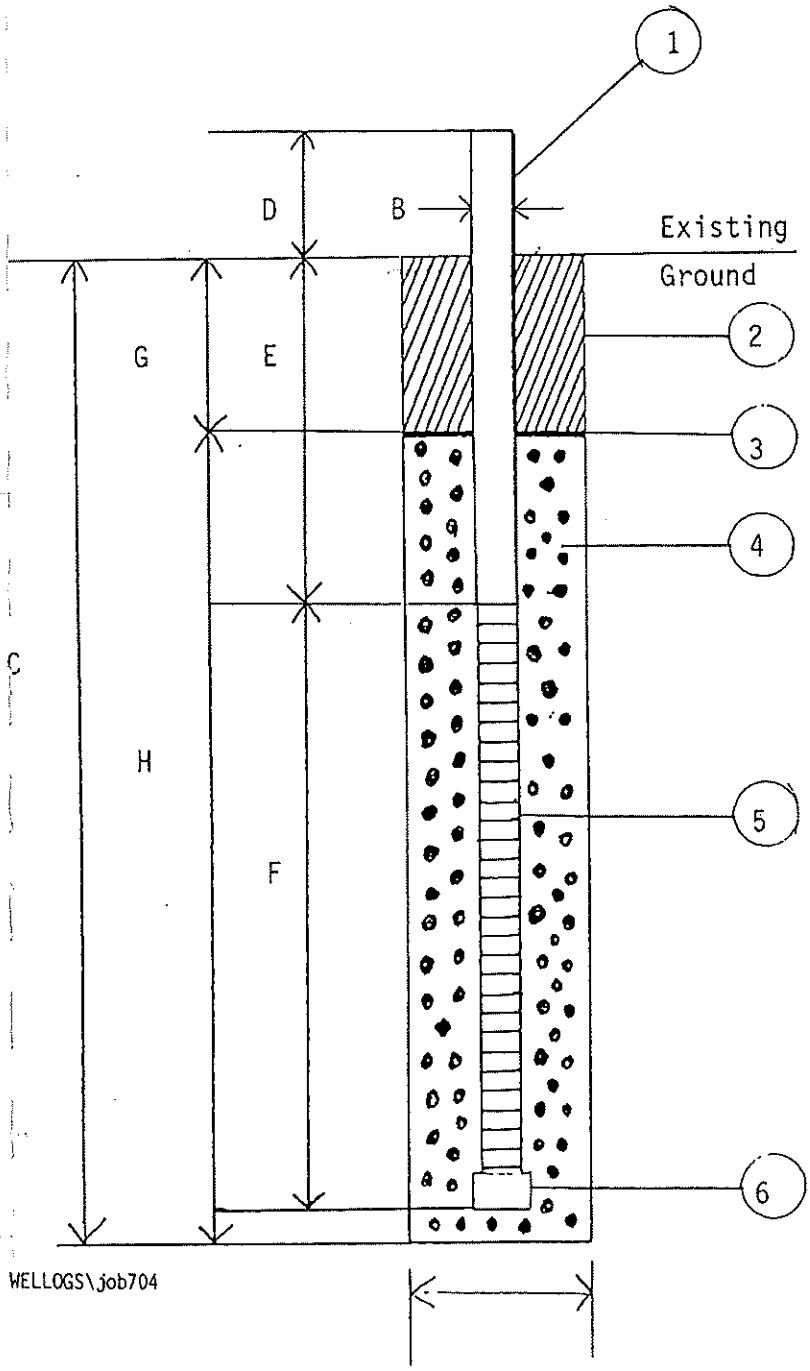
GAS EXTRACTION WELL
DESIGN/AS-BUILT

SITE Junker LFG Migration Control

DRILLING DATE July 3, 1997

WELL NO. GEW 20

WELL COORDINATES _____



MATERIAL LIST

1) SCH 80 PVC PIPE
2) GRANULAR BENTONITE
3) MIRAFI 600X GEOTEXTILE
4) 1-2" WASHED STONE
5) SCH 80 PVC FACTORY SLOTTED .040" PIPE
6) PVC SCH 80 CAP

SPECIFICATIONS

A) BORE SIZE	36	IN.
B) PIPE SIZE	6	IN.
C) BORE DEPTH	64.3	FT.
D) SOLID PIPE ABOVE GROUND	3	FT.
E) SOLID PIPE BELOW GROUND	7.5	FT.
F) SLOTTED PIPE LENGTH	56.3	FT.
G) UPPER BENTONITE SEAL	7.5	FT.
H) WASHED STONE PACK	56.8	FT.
DEPTH TO REFUSE	9	FT.

NOTES: _____

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: Junker Landfill

Facility License, Permit or Monitoring Number: _____

Type of Well: Water Table Observation Well ☐ 11
gas well Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: in waste ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☐ No

Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.

Grid Origin Location
Lat. ___ ___ ___ Long. ___ ___ ___ or
St. Plane _____ ft. N, _____ ft. E.

Section Location of Waste/Source
SE 1/4 of SE 1/4 of Sec. 13, T. 29 N, R. 19 ☐ E. ☒ W.

Location of Well Relative to Waste/Source
u ☐ Upgradient s ☐ Sidegradient
d ☐ Downgradient n ☐ Not Known

Well Name: GEW - 21

Wis. Unique Well Number _____ DNR Well Number _____

Date Well Installed: 07 / 03 / 97 (m m / d d / y y)

Well Installed By: (Person's Name and Firm)
Steve Smith
Terra Engineering & Constr.

A. Protective pipe, top elevation _____ ft. MSL
B. Well casing, top elevation 1022.04 ft. MSL
C. Land surface elevation 1018.0 ft. MSL
D. Surface seal, bottom 1010.5 ft. MSL or 7.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☐ 41
caisson Other ☒ __

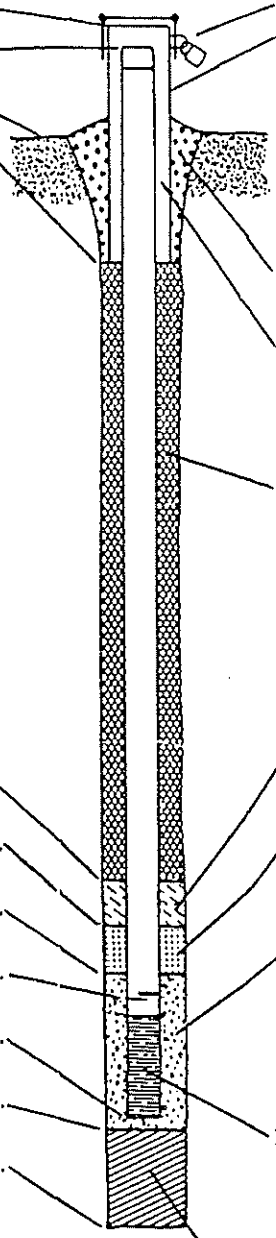
15. Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis):
_____

E. Bentonite seal, top _____ ft. MSL or _____ ft.
F. Fine sand, top _____ ft. MSL or _____ ft.
G. Filter pack, top 1010.5 ft. MSL or 7.5 ft.
H. Screen joint, top 1010.5 ft. MSL or 7.5 ft.
I. Well bottom 950.5 ft. MSL or 67.5 ft.
J. Filter pack, bottom 950.0 ft. MSL or 68.0 ft.
K. Borehole, bottom 950.0 ft. MSL or 68.0 ft.
L. Borehole, diameter 36.0 in.
M. O.D. well casing 6.63 in.
N. I.D. well casing 5.76 in.



1. Cap and lock? ☐ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: N/A in.
b. Length: N/A ft.
c. Material: Steel ☐ 04
_____ Other ☐ __
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____
3. Surface seal: Bentonite ☒ 30
Concrete ☐ 01
_____ Other ☐ __
4. Material between well casing and protective pipe:
Bentonite ☐ 30
Annular space seal ☐ __
_____ Other ☐ __
5. Annular space seal: a. Granular Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. _____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01
Tremie pumped ☐ 02
Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. N/A Other ☐ __
7. Fine sand material: Manufacturer, product name & mesh size
a. N/A __
b. Volume added - ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. 1-2" washed stone __
b. Volume added 413 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☐ 23
Flush threaded PVC schedule 80 ☒ 24
_____ Other ☐ __
10. Screen material: _____
a. Screen type: Factory cut ☒ 11
Continuous slot ☐ 01
_____ Other ☐ __
b. Manufacturer _____
c. Slot size: 0.040 in.
d. Slotted length: __.__ ft.
11. Backfill material (below filter pack): None ☒ 14
_____ Other ☐ __

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

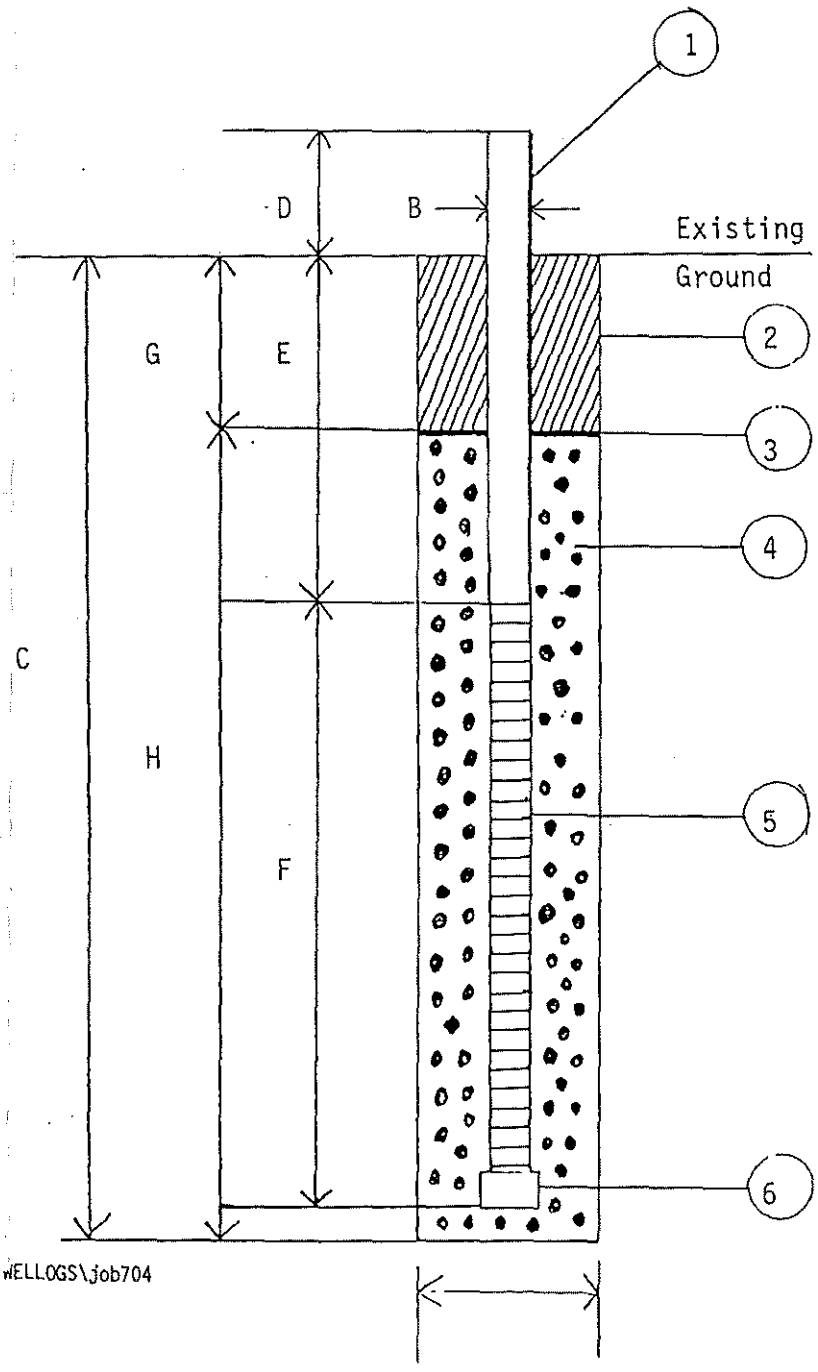
GAS EXTRACTION WELL
DESIGN/AS-BUILT

SITE Junker LFG Migration Control

DRILLING DATE July 3, 1997

WELL NO. GEW 21

WELL COORDINATES _____



MATERIAL LIST

1) SCH 80 PVC PIPE
2) GRANULAR BENTONITE
3) MIRAFI 600X GEOTEXTILE
4) 1-2" WASHED STONE
5) SCH 80 PVC FACTORY SLOTTED .040" PIPE
6) PVC SCH 80 CAP

SPECIFICATIONS

A) BORE SIZE	36	IN.
B) PIPE SIZE	6	IN.
C) BORE DEPTH	68	FT.
D) SOLID PIPE ABOVE GROUND	4	FT.
E) SOLID PIPE BELOW GROUND	7.5	FT.
F) SLOTTED PIPE LENGTH	60	FT.
G) UPPER BENTONITE SEAL	7.5	FT.
H) WASHED STONE PACK	60.5	FT.
DEPTH TO REFUSE	8	FT.

NOTES: _____

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste
☐ Wastewater
☐ Emergency Response
☐ Haz. Waste
☐ Underground Tanks
☐ Water Resources
☐ Other

SOIL BORING LOG INFORMATION

Form 4400-122 7-91

Facility / Project Name	License/Permit/Monitoring Number	Boring Number
JUNKER LANDFILL		LEW-1

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
ENVIRONMENTAL & FOUNDATION DRILLING, INC. Frank Badula	10 / 30 / 96 (MM DD YY)	10 / 31 / 96 (MM DD YY)	HSA

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		LEW-1	N/A Feet MSL	Feet MSL	14.25 inches

Boring Location
State Plane N E S/C/N | Lat Long
SE 1/4 of SE 1/4 of Section 13 T 29 N, R 19 W

Local Grid Location (If Applicable)
☐ N ☐ E
Feet ☐ S Feet ☐ W

County	DNR County Code	Civil Town/City/ or Village
ST. CROIX	5 6	TOWN OF HUDSON

Sample Number	Sample Length Recovered (in)	Blow Counts (N)	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	LEL %	O_2%	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: P 200	RQD/ Comments
1	16	2, 3 4, 5		Standing water on surface. 6" topsoil, brown-black Clayey SAND, dark brown: Wet	SC						7			
2	8	12, 8 5, 5		SAND, fine-medium, moist to dry Little coarse Sand, trace fine-coarse Gravel	SP						13			
3	24	3, 4 10, 17	5	Silty Sandy CLAY to 6' Brownish yellow to dark brown	CL						14			
				Fine SAND to 7'	SP									
4	4			Sand covered material to approximately 8' Trash, wood, PVC @ 8'										
			10	Trash, paper, cloth rags, wood, sand Fairly dry										
			15	Wet Black, sludge, wire, plastic, cloth bags, tubing metal/ plastic, steel.										
			20											
			25											
			30											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature | Firm: Dames and Moore, Madison, WI

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a seperate offense, pursuant to ss 144.99 and 162.06, Wis. Stats

a:\junker\lhw-04-1.grm

APPENDIX D

PRE-FINAL COMPLETION BULLET LIST

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

25 Kessel Court, Suite 201
Madison, Wisconsin 53711-6227
608 273 2886 Tel
608 273 3415 Fax

October 27, 1997

Ms. Wendy Anderson
WDNR - West Central Region Headquarters
1300 W. Clairemont Avenue
P.O. Box 4001
Eau Claire, WI 54702-4001

Subject: Pre-Final Inspection at the Junker Sanitary Landfill Site

Dear Ms. Anderson:

This letter serves as the record of meeting minutes for the pre-final inspection conducted by Dames & Moore, SEH, and the WDNR at the former Junker Landfill in Hudson, Wisconsin on October 21, 1997.

During the site walkthrough, several issues were identified. These include surveying the "low" area near LEW-1 and GEW-20 to determine if it is sloped properly for drainage, clean out the culvert that runs beneath the access road north of the storage shed; test the level floats in the condensate tank to see if a high level condition will shut down the gas and leachate systems; repair the leachate ports on the piston pump wells so a water level indicator may be dropped into the well; repair eroded places in ditch; and withhold a portion of the final payment to cover reseeding the landfill (if necessary) in the spring. After the meeting, SEH conducted an in depth review of the gas system to determine the source of the high oxygen levels. The lateral pipe that supplies GEW-13, GEW-14, and GEW-15 has separated from the main header line in the western manhole along Alexander Road. The pipe separation is approximately six to eight inches. Also, LEW-1 has developed a gas leak which must be remedied. Apparently, the angle of the well and pump allows flexing of the line and destruction of the metal-to-PVC connection between the pump motor and riser pipe.

All of these items were communicated to Terra in a letter dated October 23, 1997, which is enclosed for your reference. The repairs to the system are tentatively scheduled for Tuesday, November 4, 1997. A pre-final inspection report will be issued following the repair activities and will also identify the date and time for the final inspection at the landfill.

During the meeting, we also reviewed miscellaneous details of the carbon filter installations and OM&M concerns at the landfill and surrounding residential properties. The WDNR will coordinate updating the deed notices for Martineau (881 E. Highway 12) and Relf (772 Holden Lane) to reflect that carbon filters have been installed at those properties. It was decided that the OM&M contractor will be responsible for sampling the influent/effluent from the treatment systems. Beginning in 1998, this will also include the initial well sampling at new homes and influent/effluent sampling conducted within two weeks of installation of the carbon filters. It was decided that the Stockeys at 888 E. Highway 12 would have quarterly influent and semi-annual effluent sampling of their carbon filter system.

We reviewed the reporting requirements for the construction portion of the remedy and the system OM&M. As mentioned previously, a pre-final inspection report will be issued after completion of the previously mentioned items. After the final inspection is conducted, a draft construction documentation report will be submitted to the WDNR. The WDNR comments will then be incorporated in the final construction documentation report. This final construction documentation report will also include a cost update for the escrow account and a detailed description of how we currently identify new homes to include in the carbon filter installation program. The first quarterly progress report will be issued in February 1998, following completion of the January 1998 quarterly sampling activities. These quarterly letter reports will not include data for the landfill, but will include the private well sampling results (identified as Table 1 in the Dames & Moore progress reports). The annual review of the remedy and report will be due February 28, 1999. This report will include trends in groundwater and gas production and an assessment of whether groundwater contaminant conditions near the landfill have been affected by the remedy. The annual review report will be divided into two sections. One will address on-site issues and the other off-site issues. The monthly progress reports currently submitted by Dames & Moore will no longer be issued.

The WDNR also requested that Dames & Moore periodically evaluate the Landfill Remediation Trust account budget during the O&M period, and compare it to current expenditures. Mr. Jim Junker is authorizing a new attorney to oversee the Trust account. It is assumed that the new attorney will perform this task.

If you have any questions, please do not hesitate to call.

Sincerely yours,

DAMES & MOORE

Julie A. Hoffman
Staff Engineer

David P. Trainor, P.E., P.G.
Managing Associate

Enclosure

cc: Mr. Pat Collins
Mr. James Junker
Mr. Frank Lowry
Mr. Chris Weggemann

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

25 Kessel Court, Suite 201
Madison, Wisconsin 53711-6227
608 273 2886 Tel
608 273 3415 Fax

October 23, 1997

Mr. Chad Sell
Terra Engineering & Construction
2201 Vondron Road
Madison, WI 53718

RE: Construction Completion Punch List
Junker Landfill, Hudson, Wisconsin

Dear Chad:

I am forwarding the punch list for incomplete items at the Junker landfill. This list was put together after a site review by Dames & Moore, SEH and the WDNR.

- Line separation at "tee" in western manhole along Alexander Road. There is a 4" line coming out of the landfill (supplies GEW-13, 14 and 15) that separated approximately eight to eighteen inches from the main header pipe. This separation is from a field-constructed tee. The separated pipe appears to be egg-shaped, and is completely disconnected from the main header line. The bottom of the manhole is earth. Some condensate/leachate has drained into the manhole from the separated line. SEH will check the eastern manhole tomorrow and inspect the break in the western line more thoroughly. Repairs will require confined space entry because of the presence of landfill gases. If high oxygen levels persist after repairs are made, a system-wide pressure test will be required.

- LEW-1 piston pump developed a leak. There is a PVC to galvanized connection between the motor and the well. This is a threaded connection. The flexing of the line during pump operation has created a leak. It appears the threads are still intact, but the flexing motion may result in a catastrophic failure at the PVC-metal connection. Perhaps both the riser and pump need to be supported to prevent flexing?

- The blower and flare were turned off when the separated lateral line was discovered. However, the leachate pumps continued to run and had to be turned off manually. (The pumps were supposed to be relayed to the main system and turn off whenever the gas system was down.)

- The tank level floats were manually raised/lowered to determine if the system would shut down when the tank reached high level. The gas and leachate systems did not turn off. Check the operability of the level floats in the tank and the logic connecting the level floats to the gas and leachate pumping systems. The level float repair will be handled as an extra. However, the leachate pumps should have been wired into the system shutdown as part of the project activities.

- "Low" area near LEW-1 and GEW-20. The WDNR thought that this area may be lower than surrounding land to the east and may not drain toward the ditch. A survey of this area should be conducted. If proper surface drainage is not occurring, regrade/fill low area to permit drainage.

- Access to leachate ports on LEW-1, GEW-20 and GEW-21. We are not able to drop the leachate level probe into these wells. It appears a rubber gasket is blocking the hole. Drill out the gasket material located beneath each access port.

- The 18" culvert pipe that runs beneath the access road near the storage shed is plugged. This culvert needs to be opened to allow surface water to drain toward the western portion of the site.

- The 10% retainer on the project will be withheld for possible reseeding. If the seeded areas grow in this spring, we will request final payment at that time. However, if reseeding is required, Terra will be notified and final payment issued after site restoration.

SEH is returning to the site tomorrow to further investigate the separated pipe. They will also open the eastern manhole to see if that "tee" is intact. I will call you as soon as SEH notifies me of the particulars.

Wednesday, October 22 and Monday, November 3 are bad for me. However, if Wednesday next week is the only day Terra can work, I could drive up that afternoon and be at the site around 5 or 6 p.m. to answer any questions and do a final walkthrough with Terra.

Please call with any questions and to arrange the site work.

Sincerely,

DAMES & MOORE

Julie A. Hoffman
Project Manager

cc: Mr. James Junker

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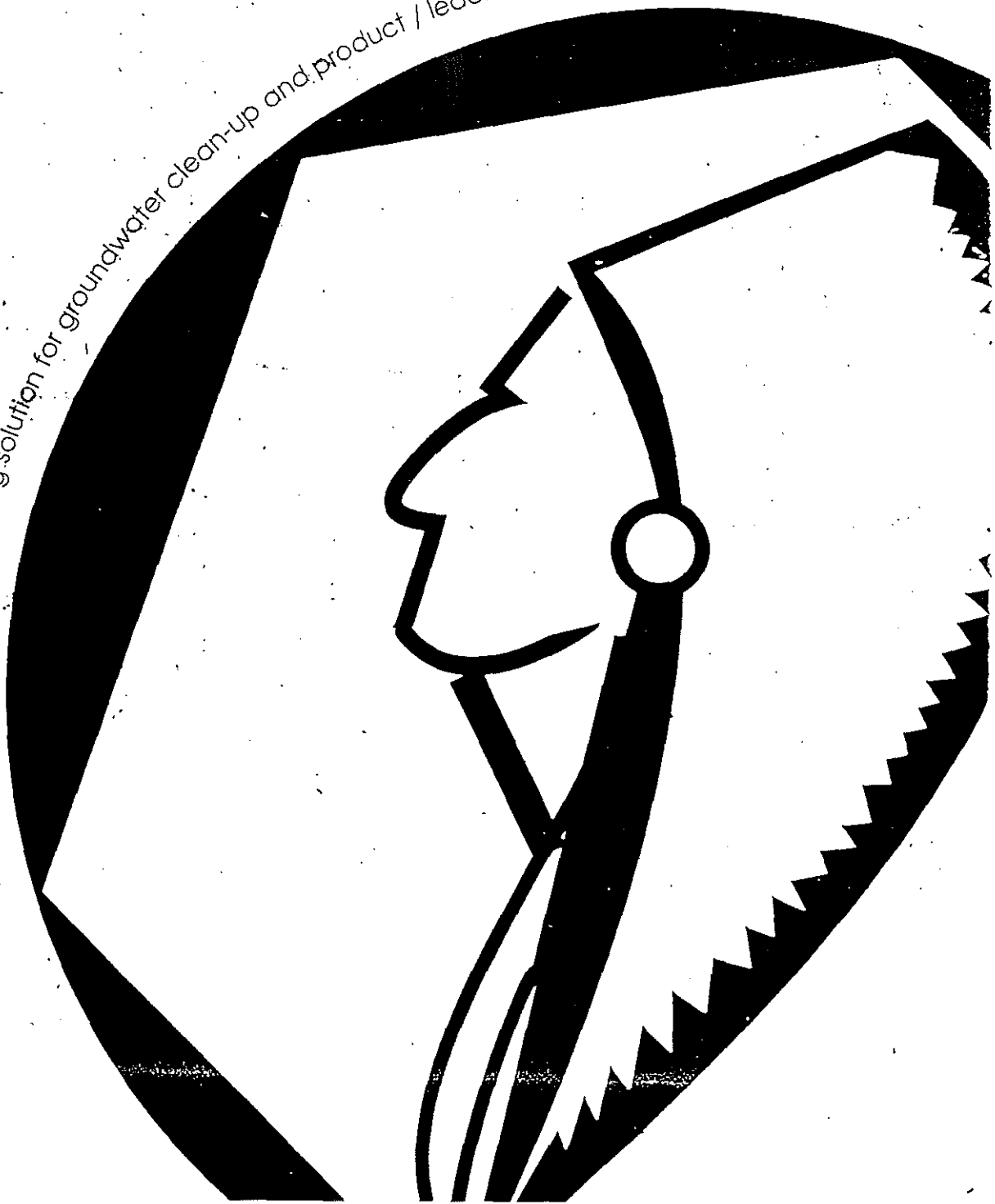
APPENDIX E

MANUFACTURER'S LITERATURE

BLACKHAWK
Environmental Company

Offering the perfect pumping solution for groundwater clean-up and product / leachate recovery.



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 drive head motor assembly at surface grade.
1.4 The pump shall be Blackhawk Anchor Pump® model 101 or equal.

2.0 System Capacity and Drive Head Motor Assembly 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 and screen shall be stainless steel, and/or Thermoplastic.
3.3 The piston shall have seals that resist chemical degradation.
3.4 A screen shall be included as part of the suction inlet assembly.
3.5 A stuffing box shall be used at surface grade to prevent liquid from entering the drive head motor assembly.
3.6 Name plate shall be affixed to the pump head. The pump model shall be noted on nameplate.

4.0 Pneumatic Drive Head Design

4.1 The motor shall be of a pneumatic 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 drive head motor assembly 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 head motor assembly at surface grade shall be enclosed in a PVC protective shroud suitable for outdoor installations.

1.0 Scope

1.1 The pump shall be designed for wet or dry operation.
1.2 The pump shall be able to pump .125 gpm per stroke at 0 submergence.
1.3 The pump shall be driven by a top drive head motor assembly at surface grade.
1.4 The pump shall be Blackhawk Anchor Pump® model 102 or equal.

2.0 System Capacity and Drive Head Motor Assembly Requirements

2.1 The pump shall have the capacity of 5 US GPM when operating at 0 submergence.
2.2 The drive head shall be rated for120 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 and screen shall be stainless steel and/or thermoplastic.
3.3 The piston shall have seals that resist chemical degradation.
3.4 A screen shall be included as part of the suction inlet assembly.
3.5 A stuffing box shall be used at surface grade to prevent liquid from entering the drive head motor assembly.
3.6 Name plate shall be affixed to the pump head. The pump model shall be noted on nameplate.

4.0 Pneumatic Drive Head Design

4.1 The motor shall be of a pneumatic 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 drive head motor assembly 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 head motor assembly at surface grade shall be enclosed in a PVC protective shroud suitable for outdoor installations.

1.0 Scope

1.1 The pump shall be designed for wet or dry operation.
1.2 The pump shall be able to pump .275 gpm per stroke at 0 submergence.
1.3 The pump shall be driven by a top drive head motor assembly at surface grade.
1.4 The pump shall be Blackhawk Anchor Pump® model 103 or equal.

2.0 System Capacity and Pneumatic Drive Head Motor Assembly Requirements

2.1 The pump shall have the capacity of 11 US GPM when operating at 0 submergence.
2.2 The drive head shall be rated for120 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 and screen shall be stainless steel and/or Thermoplastic.
3.3 The piston shall have seals that resist chemical degradation.
3.4 A screen shall be included as part of the suction inlet assembly.
3.5 A stuffing box with Nitril seals shall be used at surface grade to prevent liquid from entering the drive head motor assembly.
3.6 Name plate shall be affixed to the pump head. The pump model shall be noted on nameplate.

4.0 Pneumatic Drive Head Design

4.1 The motor shall be of a pneumatic 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 drive head motor assembly 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 head motor assembly at surface grade shall be enclosed in a PVC protective shroud suitable for outdoor installations.

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*

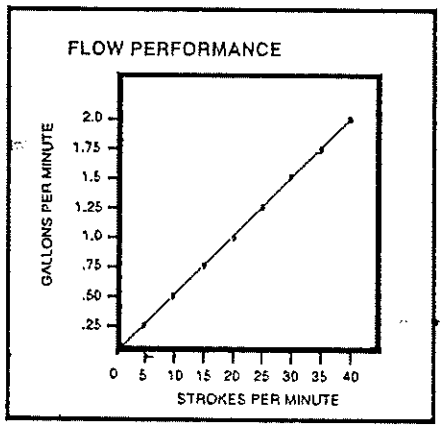
Desired pumping rate _____ gpm
Continous ____ , or Intermittent ____
Well head discharge pressure required _____ psi
Total dynamic head (TDH) _____ ft.
Static fluid level _____
Expected dynamic fluid level _____
Down hole temperature _____ F.

3. *Well Fluid*

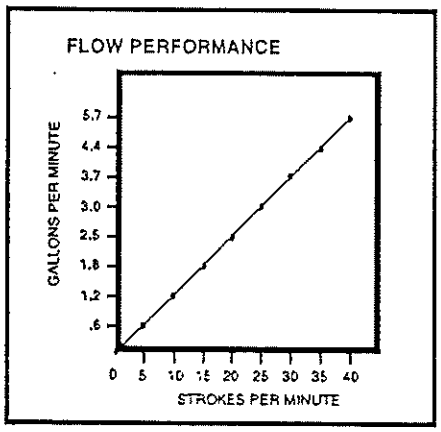
Avg. specific gravity _____
Viscosity _____
Chemical compostition. Water % _____
_____
_____
_____
Solids content % by volume: none _____
clay _____
sand _____
silt _____
other _____

4. *Power Supply*

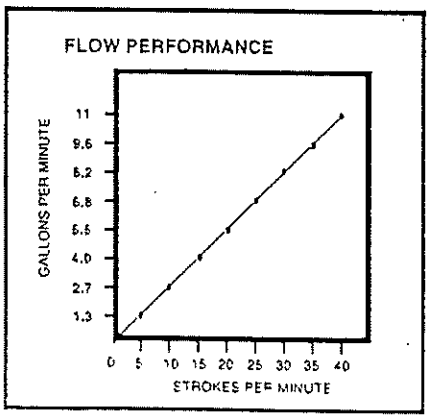
Air supply pressure at well _____ psi
Electric supply Voltage _____
Phase _____



Anchor Pump® 101

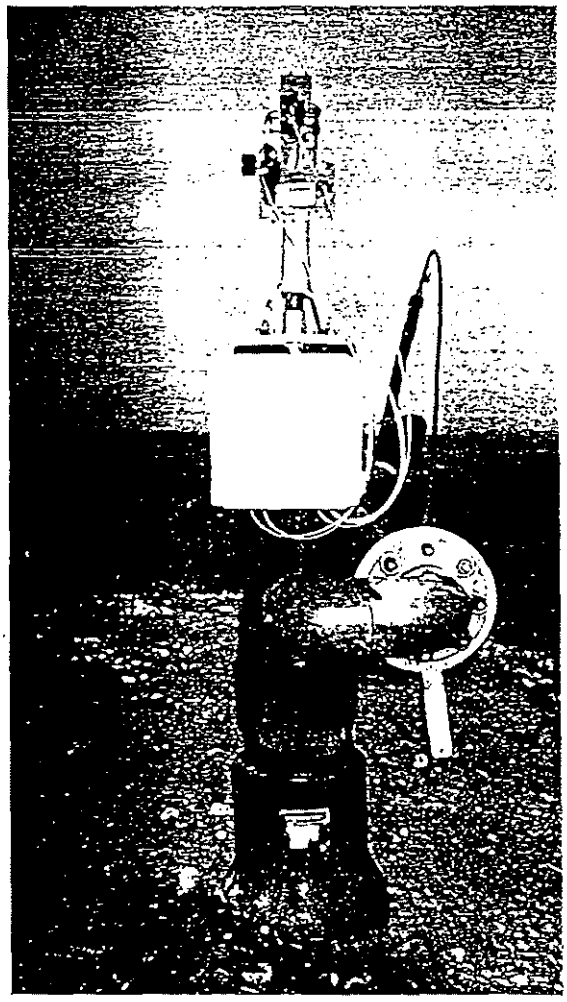


Anchor Pump® 102



Anchor Pump® 103

Installation and Operating Instructions

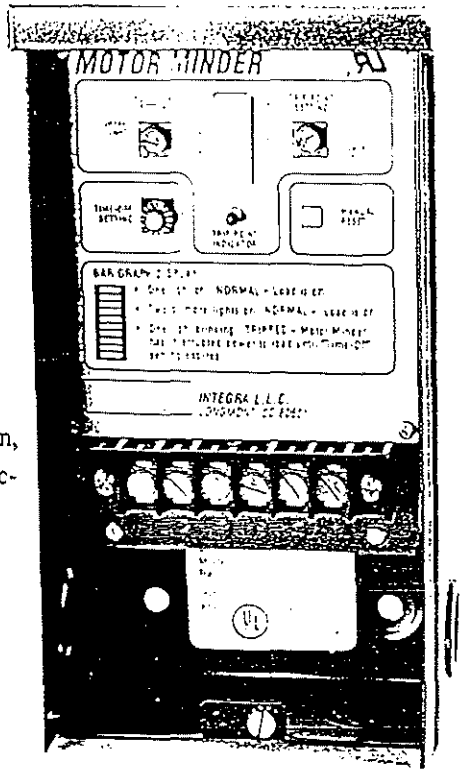


BLACKHAWK
ENVIRONMENTAL COMPANY

INTEGRA LLC
The Innovator in Electrical Control Technology

Motor Minder

The Smart Way to Protect Your Pump Investment



Pump Monitoring System

Motor Minder™ is a heavy duty motor control that protects pumps from burnouts caused by underload or rapid cycle conditions. When it detects an underload condition, the Motor Minder™ will automatically shut off the pump to prevent burnout and unnecessary wear to the pumping mechanism. The system will restart automatically after a set period, or it can be restarted manually.

Effective Protection From Damage Caused By:

- Plugged Suction
- Dry Well
- Slow Recovery
- Cavitation or Airlock
- Loss of Flow
- Rapid Cycling
- Frozen Discharge Line
- Broken Shaft or Drive Coupling

System Sentinel

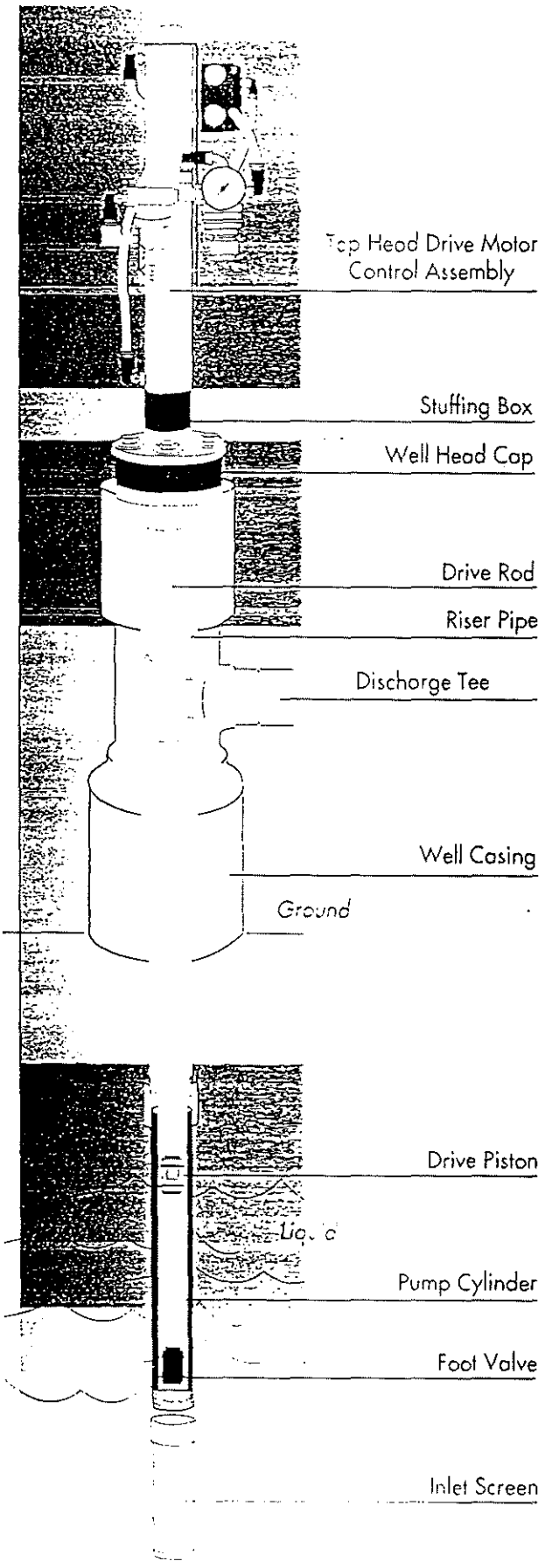
With Motor Minder's™ exclusive System Sentinel feature, you can easily diagnose the condition of your pumping system. The System Sentinel uses a series of lights which are visible through the panel cover. Two lights indicate the pump is in a normal operating condition. When one light is blinking, Motor Minder™ has turned off the pump. When no lights are on, you have a power failure, blown fuse, or a tripped circuit breaker. Now you can instantly determine your pump's operating status and prevent unnecessary service calls.

Features	Benefits
Full Adjustability	Adjust the "Load Setting" and "Trip Point Threshold" to meet your precise sensitivity requirements. "Automatic Restart Timer" adjusts from 9 minutes to 4 hours.
Light Bar Display	Used for calibration and monitoring load status. As the current drops, the lights descend toward your pre-set threshold. If the system is about to go off you can adjust consumption accordingly.
Easy to Install	Installs in minutes on new or existing systems. No plumbing required. Heavy-duty lug-type terminal. Rain-tight housing.
Linear Toroid Sensing	INTEGRA uses an exclusive linear toroid which senses current flow magnetically. This method is more reliable under locked rotor or other high current conditions.
Choose from 6 Models	There's a Motor Minder™ to fit virtually any pump system — from single phase to three phase, from 115V to 460V, from 1/20th HP to 50 HP. Available in code-approved enclosure or panel-mount.
Built-in Transient Protector	Protects the control from damage caused by lightning or line-voltage surges.
One-Year Warranty	Solid state construction, state-of-the-art engineering and quality craftsmanship make Motor Minder™ an affordable device you can count on for many years.

SECTION 1

SHIPMENT INSPECTION

Examine the components carefully to make sure no damage has occurred to the pump cylinder, top head drive motor assembly, drive rod and piston. This Anchor Pump® should remain in it's shipping carton until it is ready to be installed. You will find a loose data plate wired to the pump. It should be securely mounted at the well.

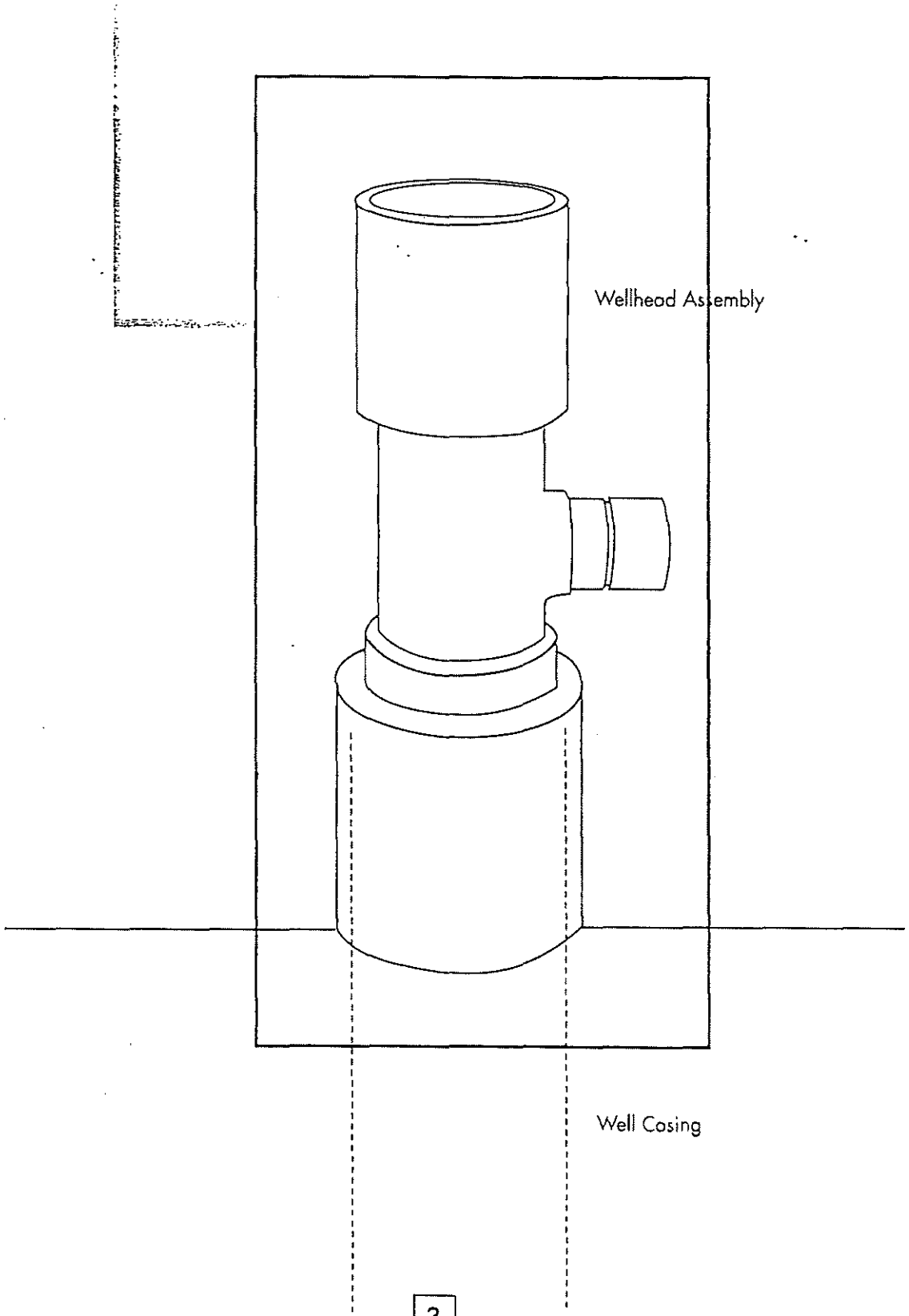


SECTION 3

ANCHOR PUMP WELLHEAD INSTALLATION

Step 1

Attach new wellhead to top of riser pipe or existing wellhead.

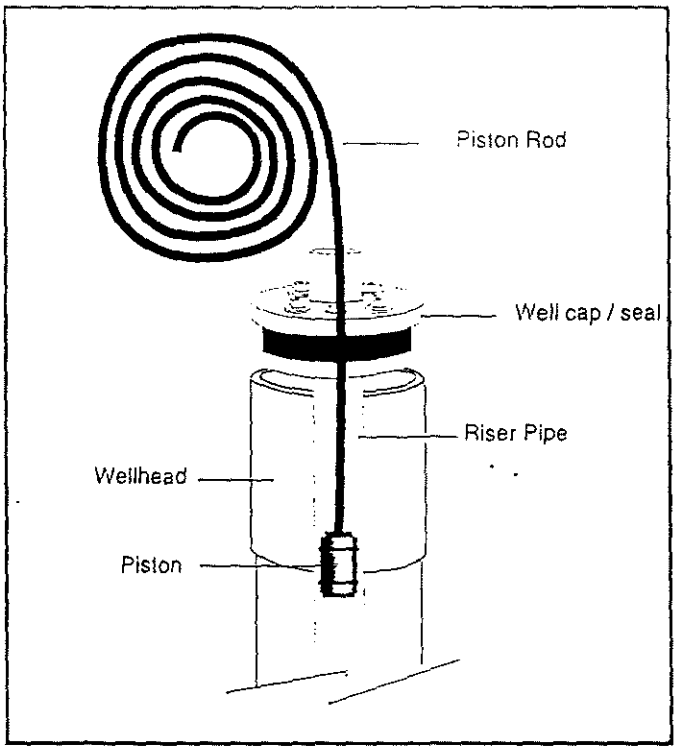


DRIVE ROD/PISTON INSTALLATION

Step 4

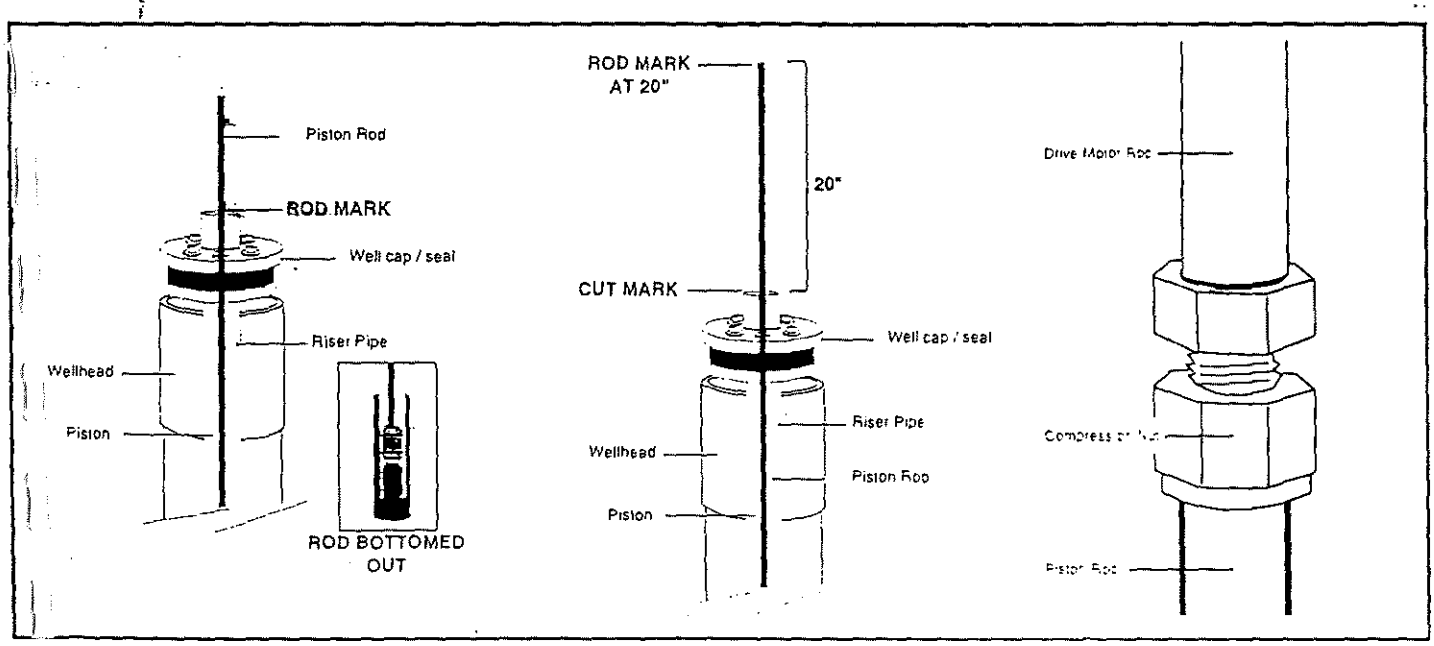
A. Uncoil piston-rod-assembly
(Lay coil out in open area. Stand in middle of coil when uncoiling.
(Caution: Coil under tension!)

B. Slide drive piston down riser pipe to bottom.



CONNECTION OF ROD TO TOP HEAD DRIVE MOTOR ASSEMBLY

Step 5



A. Rod bottomed out – mark rod.

B. Rod raised and cut 20" below mark

C. Attach compression fitting to the cut end of rod, and screw into drive motor rod.

SECTION 4

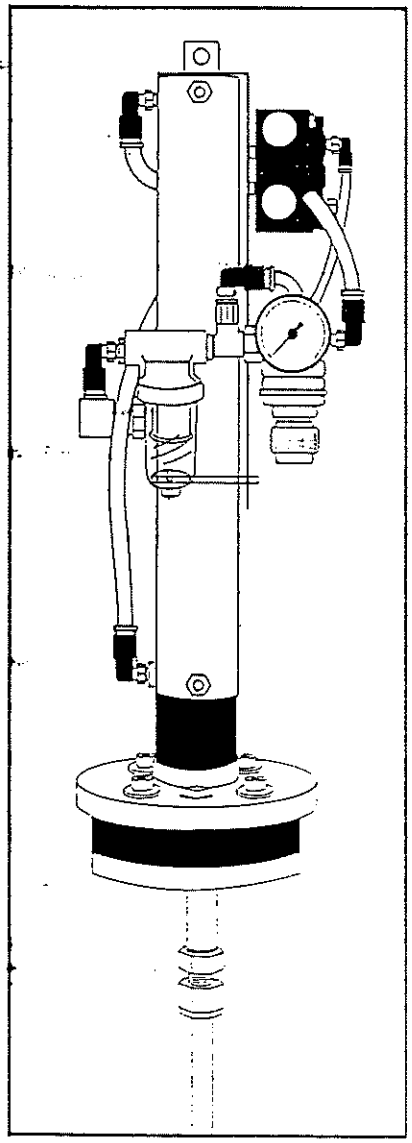
-PNEUMATIC DRIVE MOTOR REFER TO SECTION 5 FOR SEPARATE INSTALLATION AND OPERATION SHEET OF THE DRIVE MOTOR SUPPLIED FOR JOB.

-ELECTRIC DRIVE MOTOR REFER TO THE SEPARATE INSTALLATION AND OPERATION SHEET FOR THE DRIVE MOTOR SUPPLIED FOR JOB.

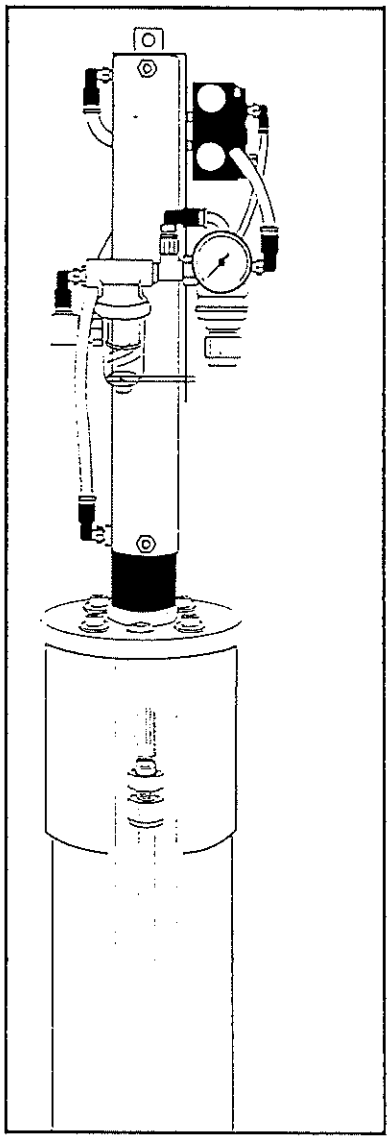
SECTION 6

OPERATION

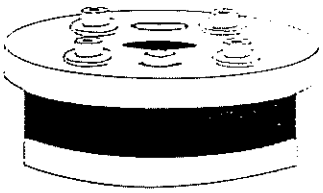
The Anchor Pump® and system should be periodically checked for fluid quality, pressure, drawdown, cycle rate, and performance of the stuffing box. Under no circumstances should the pump be operated for any period of time with the discharge valve closed or the discharge pipe clogged. This can result in severe back pressure against the drive motor, stuffing box or drive piston causing pump failure. A properly sized relief valve should be installed at the well head to prevent the pump from running against a closed valve or clogged pipe.



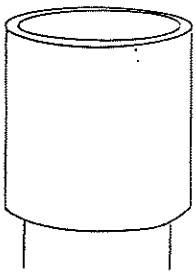
1. Visually inspect Anchor Pump® operation.
2. Check liquid discharge.
3. Check air pressure.
4. Check air lines.
5. Check stuffing box relief ports.
6. Check piston seal.
   - Turn off air supply.
   - Remove air line from drive motor.
   - Unscrew drive motor from wellhead.
   - Disconnect drive motor from drive rod.
   - Extract piston rod from well.
   - Inspect piston seal and, if worn replace.
   - Reinstall.



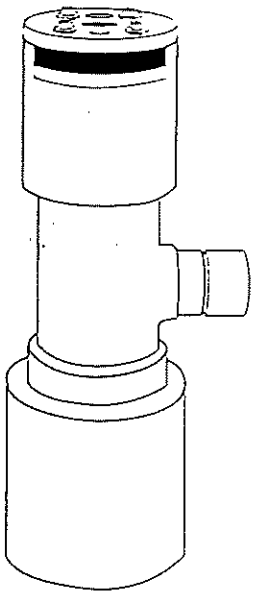
Standard Well Assembly Guide



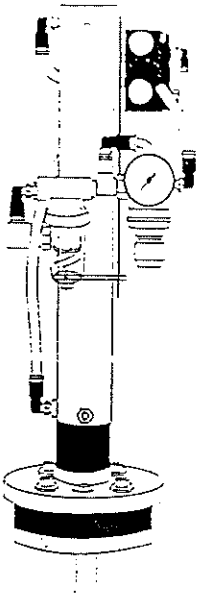
Well Head Cap



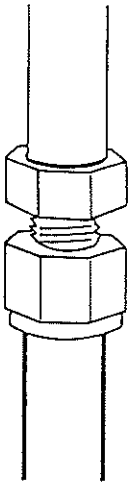
Well Head



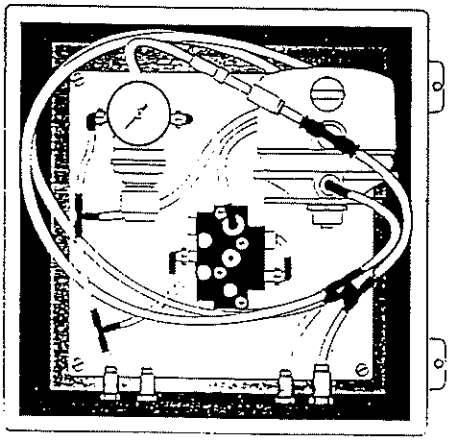
Well Head Assembly



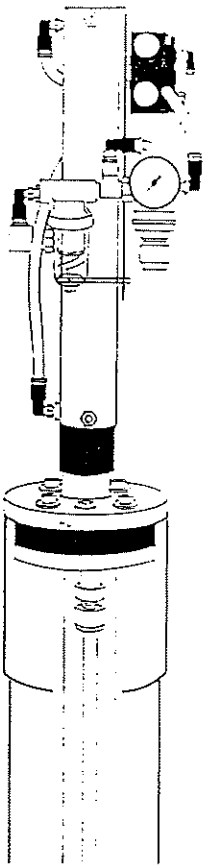
Drive Motor



Compression Fitting



Bubbler



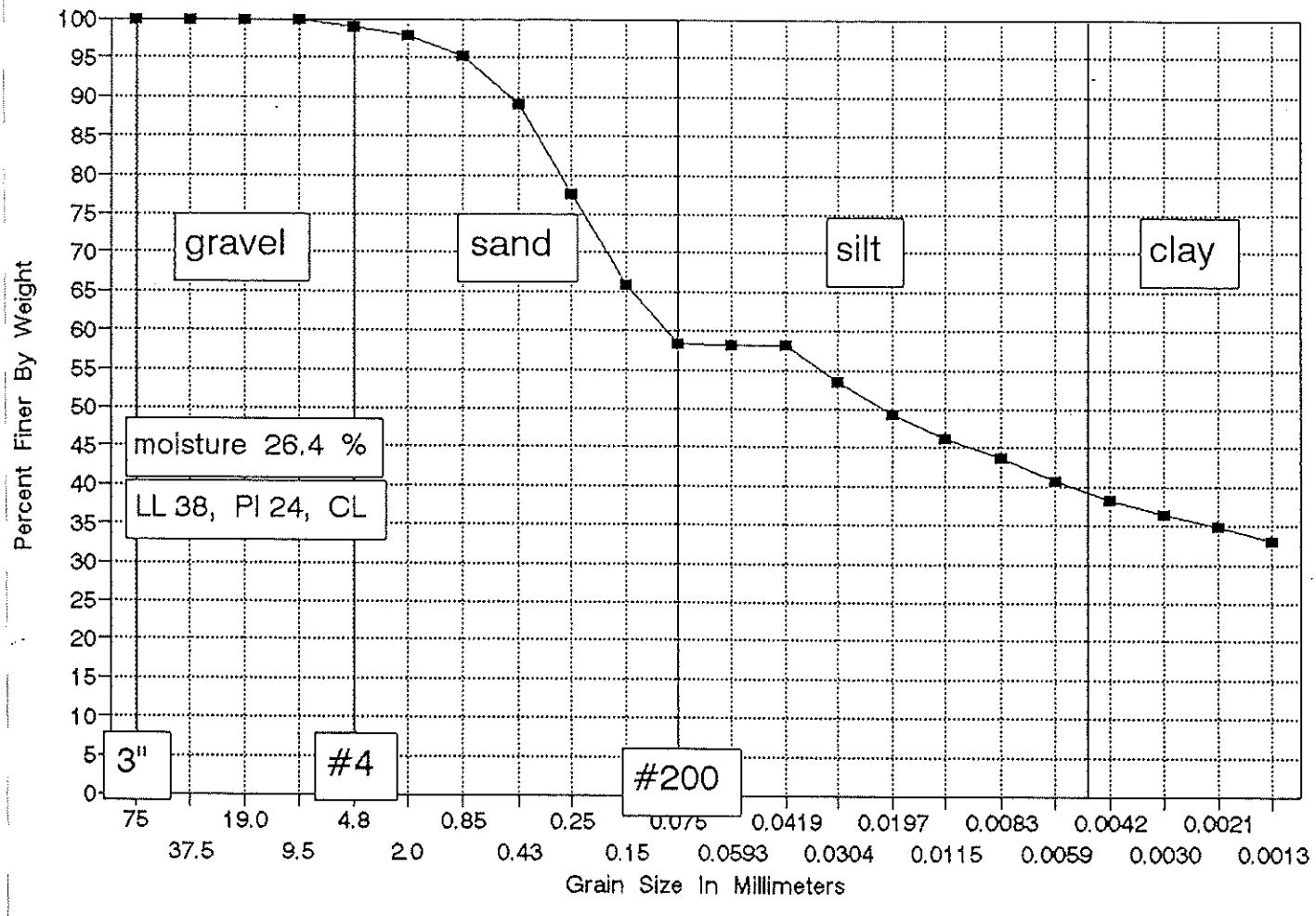
Piston Assembly

APPENDIX F

SOILS TESTING DATA

GRADATION CURVE

Cap sample lift 3, x=8+00, y=4+00



ST-43

HYDROMETER ANALYSIS

OWNER SUNKEY-LANDFILL LLC JOB NO. 5111[illegible] DATE 8/25/17

BORING NO. CHP LIFT 3 X=8+00 Y=4+00

SAMPLE SPECIMEN NO.	CLASSIFICATION	
DISH NO.	GRADUATE NO. 17	HYDROMETER NO. 152H

DISPERSING AGENT USED SODIUM HEXA META DIPHOSPHATE ; QUANITY 5.00 GRAMS

DISPERSING AGENT CORRECTION, C_D 5 ; MENISCUS CORRECTION, C_M = 1

TIME	ELAPSED TIME	TEMP °C	HYDRO READING (R')	CORRECTED READING $R+C_M-C_D$	HEIGHT Z_R	PARTICLE DIA. (MM)	PERCENT FINER PARTIAL	PERCENT FINER TOTAL
0424								
	.5	21°	45					
	1	21°	43²					
	2	21°	40¹					
	5	21°	37⁵					
	15	21°	35⁴					
	30	21°	33⁹					
	60	21°	32					
	120	21°	30⁴					
	250	21°	29²					
	500	21°	28²					
0424		21°	27					

WEIGHT IN GRAMS

DISH PLUS DRY SOIL		
DISH		
DRY SOIL	W_O	

SPECIFIC GRAVITY OF SOLIDS, G_S =

CORRECTED HYDROMETER READING (R) = HYDROMETER READING (R') + C_M

(WET) 670.5 to 670.93

THE PARTICLE DIAMETER (D) IS CALCULATED FROM STOKE'S EQUATION USING CORRECTED HYDROMETER READING. USE NOMOGRAPHIC CHART FOR SOLUTION OF STOKE'S EQUATION.

HYDROMETER GRADUATED IN SPECIFIC GRAVITY

$$\text{PARTIAL PERCENT FINER} = \frac{G_S}{G_S-1} \times \frac{100}{W_O}(R-C_D+M)$$

HYDROMETER GRADUATED IN GRAMS PER LITER

$$\text{PARTIAL PERCENT FINER} = \frac{100}{W_O}(R-C_D+M)$$

W_S = TOTAL OVEN-DRY WT. OF SAMPLE USED FOR COMBINED ANALYSIS

W_O = OVEN-DRY WT. IN GRAMS OF SOIL USED FOR HYDROMETER ANALYSIS

W_1 = OVEN-DRY WT OF SAMPLE RETAINED ON NO. 200 SIEVE

$$\text{TOTAL PERCENT FINER} = \text{PARTIAL PERCENT FINER} \times \frac{W_S-W_1}{W_S}$$

REMARKS

TECHNICIAN PJH COMPUTED BY CHECKED BY

URAQT FORM 1040-A
2-31-75

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 53178-005

CLIENT/OWNER [illegible]

LOCATION [illegible]

BORING C-1 SAMPLE U-1 DEPTH 2'

FIELD DENSITY

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

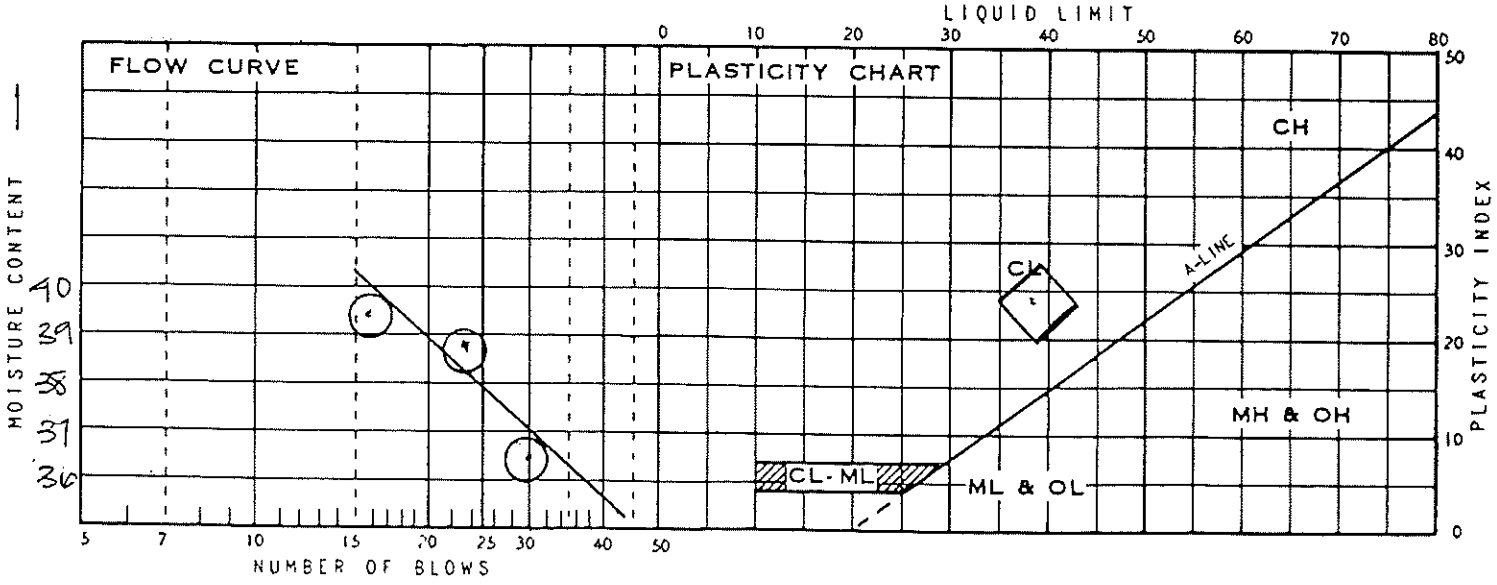
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY [illegible]

DETERMINATION	1	2	3	4	5	6
DISH	81	235				
WT OF DISH + WET SOIL	12.79	9.88				
WT OF DISH + DRY SOIL	11.39	8.84	—	—	—	—
WT OF MOISTURE						
WT OF DISH	1.39	1.35	—	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	14.07	13.89	$\bar{X}$=14			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	235	82	98			
NUMBER OF BLOWS	20	23	10			
WT OF DISH + WET SOIL	12.99	11.98	12.02			
WT OF DISH + DRY SOIL	9.85	9.05	9.00	—	—	—
WT OF MOISTURE						
WT OF DISH	1.35	1.37	1.32	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	36.35	38.89	39.32			



SUMMARY

EAL

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		38	14	24	CL	

757

DAMES & MOORE

Junker Landfill

			field
Cap Sample 1 lift 1		Wt soil and dish	289.93
x=8+10, y=1+15		Dry soil & dish	277.2
		dish	211.8
Moisture Content =	19.46 %	H	0
Wet Density =	ERR PCF	A	0
Dry Density =	ERR PCF	Ws	0
		For HA	186.23

SIEVE & HYDROMETER ANALYSIS

SIEVE PORTION

Total Sample 922.53 g

Dry weight split-3/8"= 155.9 g

sample split -#10 sieve = 47.86 g

Sieve #	Weight Retained	Total Percent Finer
1.5 inch	0	100.00%
3/4 inch	0	100.00%
3/8 inch	0	100.00%
# 4	0.79	99.49%
# 10	2.83	98.18%
# 20	1.19	95.74%
# 40	4.05	89.88%
# 60	9.34	79.02%
# 100	15.41	66.57%
# 200	19.04	59.12%

Constants this test

Gs= 2.65 20c=.01365 21c=.01348 22c=.01332

18c=.01399 19c=.01382

When 5 grams of Sodium Hexametaphosphate used correction = 6

HYDROMETER ANALYSIS

Elapsed time	Tc	R'	Zr	Particle Dia. mm	Percent Partial	Total Percent Finer
0.5	21	34	10.69	0.0639	58.51	57.44
1	21	32	11.02	0.0459	54.33	53.34
2	21	29.5	11.43	0.0330	49.10	48.21
5	21	27.6	11.75	0.0212	45.13	44.31
15	21	26.2	11.98	0.0123	42.21	41.44
30	21	24.3	12.29	0.0088	38.24	37.54
60	21	23	12.51	0.0063	35.52	34.88
120	21	22.1	12.65	0.0045	33.64	33.03
250	21	21	12.84	0.0031	31.34	30.77
500	21	19.8	13.03	0.0022	28.84	28.31
1440	21	19.2	13.13	0.0013	27.58	27.08

MECHANICAL ANALYSIS

SA ☑ HA ☑ BLK SA ☐ -#200 ☐

OWNER CLIENT [illegible] JOB NUMBER [illegible]

LOCATION/PROJECT _____ DATE 8-23-97

BORING CAP SAMPLE 5# | Lift 1 (t.v) DEPTH x=8+10 y=11+5 BY FF | RJH

DENSITY	
HEIGHT= DIAMETER=	
NUMBER OF RINGS	
WT. OF RINGS & WET SOIL	
WT. OF RINGS	
WT. OF WET SOIL	
FIELD DENSITY	
DRY DENSITY	

MOISTURE ANALYSIS	MC	tt+C	C+C	
PAN	ST 39	L-8	I	
WT. OF PAN & WET SOIL	289.93	78.23	50.46	
WT. OF PAN & DRY SOIL	277.2	77.56	49.99	
WT. OF MOISTURE				
WT. OF PAN	211.80	43.45	22.65	
WT. OF DRY SOIL				
MOISTURE CONTENT %	19.5			

WET SAMPLE	Rd		
WT. OF WET SAMPLE & PAN	217.07		
WT. OF PAN	31.49		
WT. OF WET SOIL			
WT. OF SAMPLE/ OVEN DRIED			

FIELD SAMPLE CONTAINER
ttal weight = 922.53

DRY SIEVE	WASH SIEVE

SAMPLE SPLIT ☐

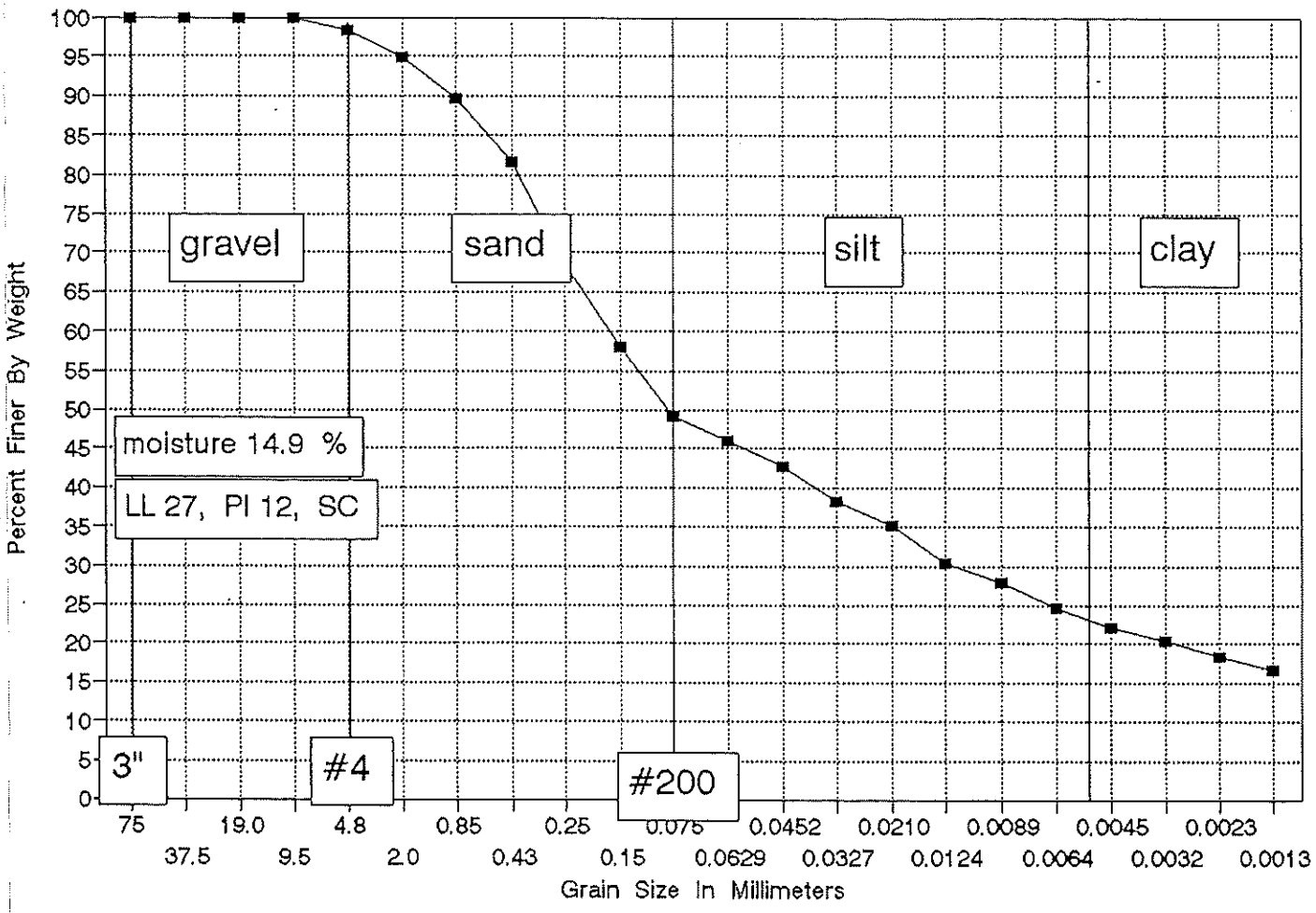
PAN NUMBER	PAN WEIGHT	SIEVE NUMBER	WEIGHT RETAINED	ACCUMULATIVE WEIGHT RETAINED	ACCUMULATIVE PERCENT		
					PARTIAL		TOTAL
					RETAINED	FINER	FINER
		3"					
		1-1/2".					
		3/4"					
		3/8"		0			
		#4		.79			
		#10		2.83			
ST12		#20		1.19			
		#40		4.05			
		#60		9.34			
		#100		15.41			
		#200		19.04			

NOTE: D

Dames & Moore

GRADATION CURVE

Ditch sample 2 lift 1, x=10+75, y=14.5



ST-41

HYDROMETER ANALYSIS

DATE 8/25/97

OWNER JUNKER - LANDFILL JOB NO. 7331-14-003

BORING NO. DITCH #2 LIFT 1 X= 1041.5 Y= 14.5

SAMPLE SPECIMEN NO.	CLASSIFICATION	
DISH NO.	GRADUATE NO. 24	HYDROMETER NO. 152H

DISPERSING AGENT USED SODIUM HEXAMETAPHOSPHATE ; QUANITY 5.00 GRAMS

DISPERSING AGENT CORRECTION, C_D 5 ; MENISCUS CORRECTION, C_M = 1

TIME	ELAPSED TIME	TEMP °C	HYDRO READING (R')	CORRECTED READING $R+C_M-C_D$	HEIGHT Z_R	PARTICLE DIA. (MM)	PERCENT FINER PARTIAL	PERCENT FINER TOTAL
0422								
	.5	21°	36					
	1	21°	34					
	2	21°	31					
	5	21°	29					
	15	21°	25.8					
	30	21°	24.2					
	60	21°	22					
	120	21°	20.4					
	250	21°	19.3					
	500	21°	18					
0422		21°	16.9					

WEIGHT IN GRAMS

DISH PLUS DRY SOIL

DISH

DRY SOIL W_O

SPECIFIC GRAVITY OF SOLIDS, G_S =

CORRECTED HYDROMETER READING (R) = HYDROMETER READING (R') + C_M

(WET) 691.55 - 628.80

THE PARTICLE DIAMETER (D) IS CALCULATED FROM STOKE'S EQUATION USING CORRECTED HYDROMETER READING. USE NOMOGRAPHIC CHART FOR SOLUTION OF STOKE'S EQUATION.

HYDROMETER GRADUATED IN SPECIFIC GRAVITY

PARTIAL PERCENT FINER = $\frac{G_S}{G_S-1} \times \frac{100}{W_O}(R-C_D+M)$

HYDROMETER GRADUATED IN GRAMS PER LITER

PARTIAL PERCENT FINER = $\frac{100}{W_O}(R-C_D+M)$

W_S = TOTAL OVEN-DRY WT. OF SAMPLE USED FOR COMBINED ANALYSIS

W_O = OVEN-DRY WT. IN GRAMS OF SOIL USED FOR HYDROMETER ANALYSIS

W_1 = OVEN-DRY WT OF SAMPLE RETAINED ON NO. 200 SIEVE

TOTAL PERCENT FINER = PARTIAL PERCENT FINER $\times \frac{W_S - W_1}{W_S}$

REMARKS

TECHNICIAN DMH COMPUTED BY _____ CHECKED BY Eld

URAQT FORM 1040-A
2-31-75

ATTERBERG LIMITS TEST DATA

JOB NO. _____

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

GL ELEV/OWNER _____

LOCATION _____

BORING _____ SAMPLE _____ DEPTH _____

FIELD DENSITY BY _____

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

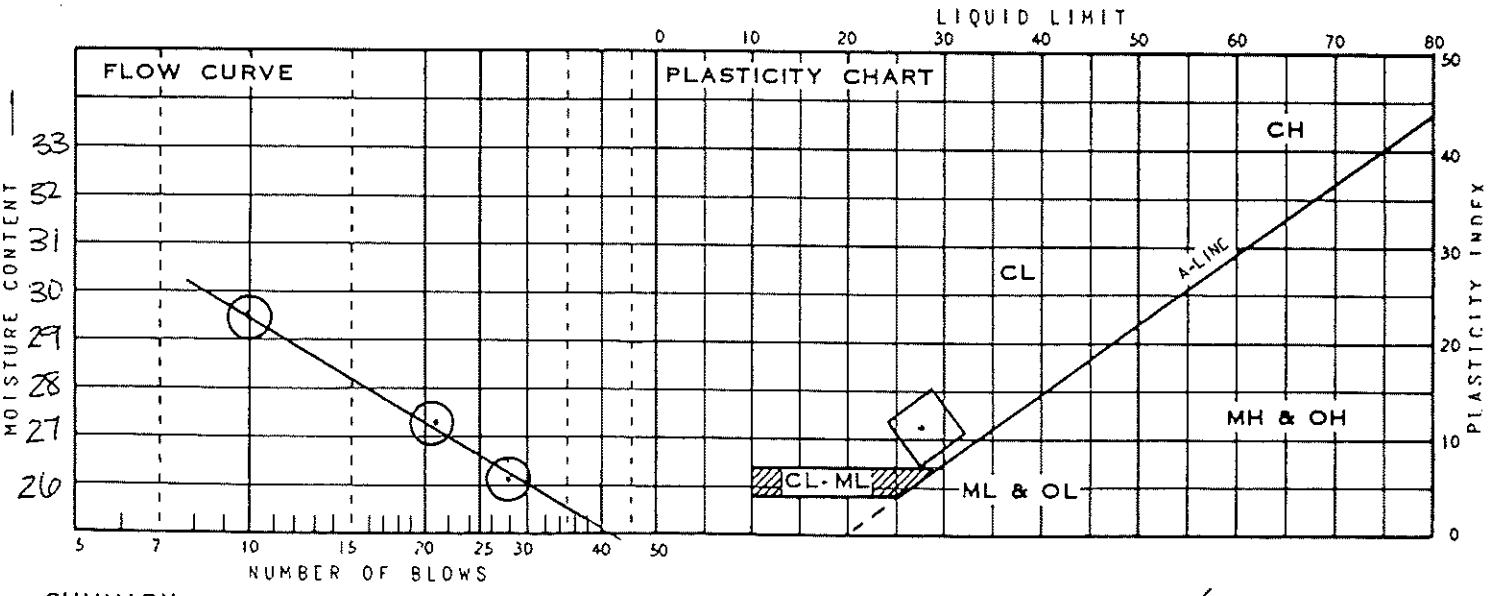
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY _____

DETERMINATION	1	2	3	4	5	6
DISH	297	6				
WT OF DISH + WET SOIL	15.17	13.13				
WT OF DISH + DRY SOIL	13.38	11.61	—	—	—	—
WT OF MOISTURE						
WT OF DISH	1.316	1.310	—	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	14.89	14.83	$\bar{X}=15$			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	293	12	606			
NUMBER OF BLOWS	38	21	15			
WT OF DISH + WET SOIL	14.40	12.86	13.62			
WT OF DISH + DRY SOIL	11.70	10.39	10.83	—	—	—
WT OF MOISTURE						
WT OF DISH	1.37	1.35	1.310	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	26.14	27.38	29.96			



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		27	15	12	CL	

757

DAMES & MOORE

Junker Landfill

field

Ditch Sample lift 3
x=5+00, y=4

Wt soil and dish	272.2
Dry soil & dish	257.5
dish	160.14
H	0
A	0
Ws	0
For HA	162.73

Moisture Content = 15.10 %
Wet Density = ERR PCF
Dry Density = ERR PCF

SIEVE & HYDROMETER ANALYSIS

SIEVE PORTION
Total Sample 939.1 g
Dry weight split-3/8"= 141.4 g
sample split -#10 sieve = 64.32 g

Sieve #	Weight Retained	Total Percent Finer
1.5 inch	0	100.00%
3/4 inch	0	100.00%
3/8 inch	0	100.00%
# 4	1.26	99.11%
# 10	6.52	95.39%
# 20	3.85	89.68%
# 40	9.62	81.12%
# 60	18.87	67.40%
# 100	26.28	56.41%
# 200	32.52	47.16%

Constants this test
Gs= 2.65 20c=.01365 21c=.01348 22c=.01332
18c=.01399 19c=.01382
When 5 grams of Sodium
Hexametaphosphate used correction
= 6

HYDROMETER ANALYSIS

Elapsed time	Tc	R'	Zr	Particle Dia. mm	Percent Partial	Total Percent Finer
0.5	21	36	10.36	0.0629	46.64	44.49
1	21	35	10.53	0.0448	45.09	43.01
2	21	32	11.02	0.0324	40.42	38.56
5	21	28	11.68	0.0211	34.21	32.63
15	21	26.3	11.96	0.0123	31.56	30.11
30	21	24.3	12.29	0.0088	28.45	27.14
60	21	22.8	12.54	0.0063	26.12	24.92
120	21	20.9	12.85	0.0045	23.17	22.10
250	21	20	13.00	0.0032	21.77	20.76
500	21	18.5	13.25	0.0022	19.44	18.54
1440	21	17.2	13.46	0.0013	17.41	16.61

MECHANICAL ANALYSIS

SA ☑ HA ☑ BLK SA ☐ -#200 ☐

OWNER/CLIENT _____ JOB NUMBER _____

LOCATION/PROJECT X = 5+00 y = 4 DATE 8-23-97

BORING _____ SAMPLE _____ DEPTH Lift 3 BY EP/RTH

DENSITY	
HEIGHT= DIAMETER=	
NUMBER OF RINGS	
WT. OF RINGS & WET SOIL	
WT. OF RINGS	
WT. OF WET SOIL	
FIELD DENSITY	
DRY DENSITY	

MOISTURE ANALYSIS	MC	HA-10	BLK-10	
PAN	N10	L-10	H	
WT. OF PAN & WET SOIL	272.2	169.19	491.05	
WT. OF PAN & DRY SOIL	257.5	67.87	448.71	
WT. OF MOISTURE				
WT. OF PAN	160.14	43.43	21.98	
WT. OF DRY SOIL				
MOISTURE CONTENT %	15.1			

WET SAMPLE	P5		
WT. OF WET SAMPLE & PAN	199.4		
WT. OF PAN	36.67		
WT. OF WET SOIL			
WT. OF SAMPLE/ OVEN DRIED			

FIELD SAMPLE CONTAINER	
total weight = 939.1	
DRY SIEVED	WASH SIEVE

SAMPLE SPLIT ☐

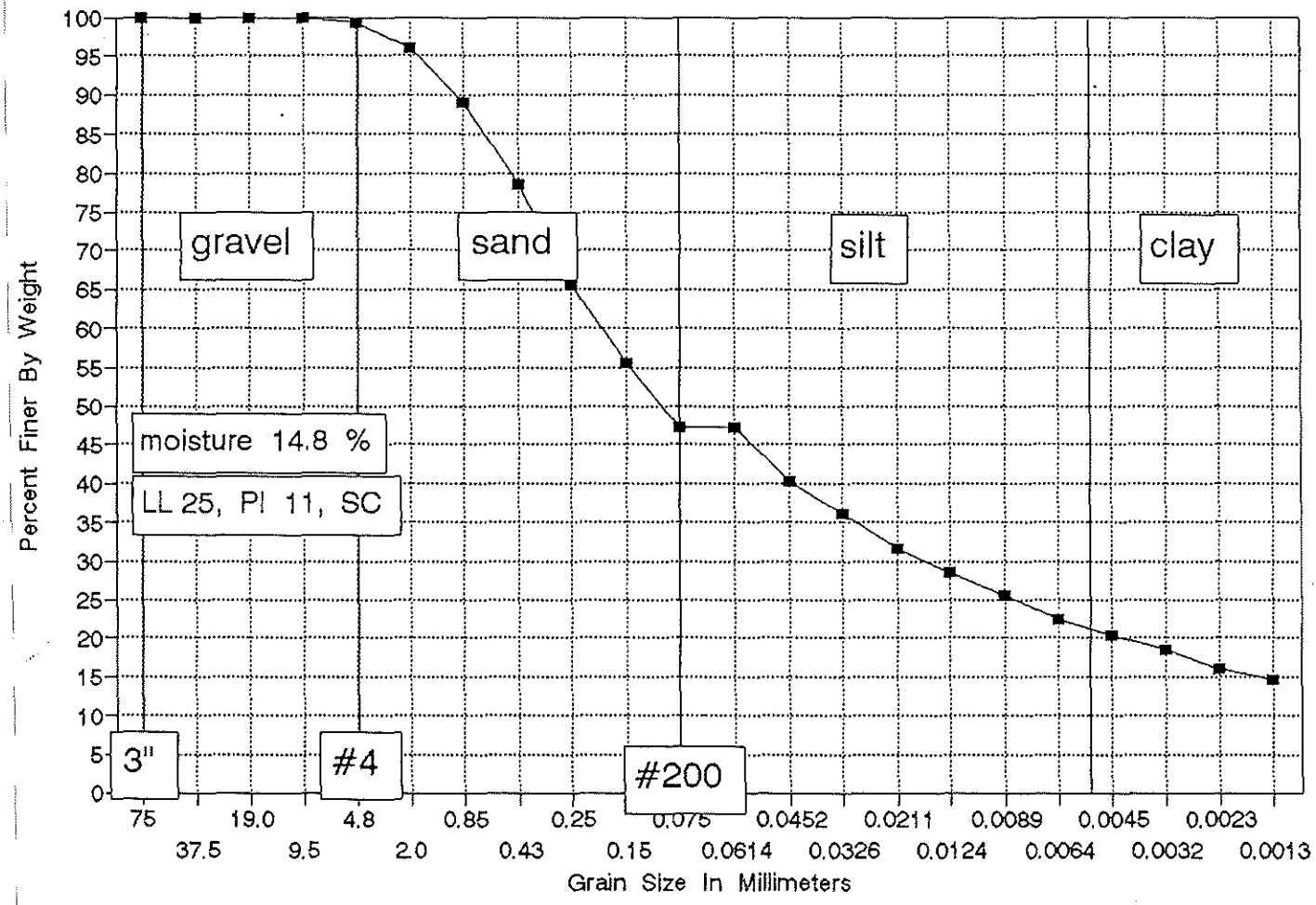
PAN NUMBER	PAN WEIGHT	SIEVE NUMBER	WEIGHT RETAINED	ACCUMULATIVE WEIGHT RETAINED	ACCUMULATIVE PERCENT PARTIAL RETAINED	ACCUMULATIVE PERCENT PARTIAL FINER	ACCUMULATIVE PERCENT TOTAL FINER
		3"					
		1-1/2".					
		3/4"					
		3/8"		0			
		#4		1.26			
		#10		6.52			
T7		#20		3.85			
		#40		9.62			
		#60		18.87			
		#100		26.28			
		#200		32.52			

NOTE: B

Dames & Moore

GRADATION CURVE

Ditch sample 3 lift 3, x=7+20, y=13 ft



ST-9

HYDROMETER ANALYSIS

OWNER JUNKER - LANDFILL JOB NO. 77317C-003 DATE 8/25/77

BORING NO. DITCH #3 LIFT 3 X=7120 Y=13F+

SAMPLE SPECIMEN NO. CLASSIFICATION

DISH NO. GRADUATE NO. 22 HYDROMETER NO. 152 H

DISPERSING AGENT USED SODIUM HEXAMETAPHOSPHATE ; QUANITY 5.00 GRAMS

DISPERSING AGENT CORRECTION, C_D 5 ; MENISCUS CORRECTION, C_M = 1

TIME	ELAPSED TIME	TEMP °C	HYDRO READING (R')	CORRECTED READING $R+C_M-C_D$	HEIGHT Z_R	PARTICLE DIA. (MM)	PERCENT FINER PARTIAL	PERCENT FINER TOTAL
0426								
	.5	21°	39					
	1	21°	34					
	2	21°	31.2					
	5	21°	28					
	15	21°	25.9					
	30	21°	23.8					
	60	21°	21.7					
	120	21°	20.2					
	250	21°	18.9					
	500	21°	17.3					
0426		21°	16.2					

WEIGHT IN GRAMS

DISH PLUS DRY SOIL

DISH

DRY SOIL W_O

SPECIFIC GRAVITY OF SOLIDS, G_S =

CORRECTED HYDROMETER READING (R) = HYDROMETER READING (R') + C_M

(WET) 1089.02 - 1016.16

THE PARTICLE DIAMETER (D) IS CALCULATED FROM STOKE'S EQUATION USING CORRECTED HYDROMETER READING. USE NOMOGRAPHIC CHART FOR SOLUTION OF STOKE'S EQUATION.

HYDROMETER GRADUATED IN SPECIFIC GRAVITY

$$\text{PARTIAL PERCENT FINER} = \frac{G_S}{G_S - 1} \times \frac{100}{W_O}(R - C_D + M)$$

HYDROMETER GRADUATED IN GRAMS PER LITER

$$\text{PARTIAL PERCENT FINER} = \frac{100}{W_O}(R - C_D + M)$$

W_S = TOTAL OVEN-DRY WT. OF SAMPLE USED FOR COMBINED ANALYSIS

W_O = OVEN-DRY WT. IN GRAMS OF SOIL USED FOR HYDROMETER ANALYSIS

W_1 = OVEN-DRY WT OF SAMPLE RETAINED ON NO. 200 SIEVE

$$\text{TOTAL PERCENT FINER} = \text{PARTIAL PERCENT FINER} \times \frac{W_S - W_1}{W_S}$$

REMARKS

TECHNICIAN PJH COMPUTED BY CHECKED BY Earl

URAQT FORM 1040-A
2-31-73

ATTERBERG LIMITS TEST DATA

JOB NO. _____

FIELD CLASSIFICATION _____

CLIENT/OWNER [illegible]

LABORATORY CLASSIFICATION _____

LOCATION X = 7+26 Y = 1397

BORING B-16 SAMPLE 11-3 (1) DEPTH 1'-6"

FIELD DENSITY BY _____

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD

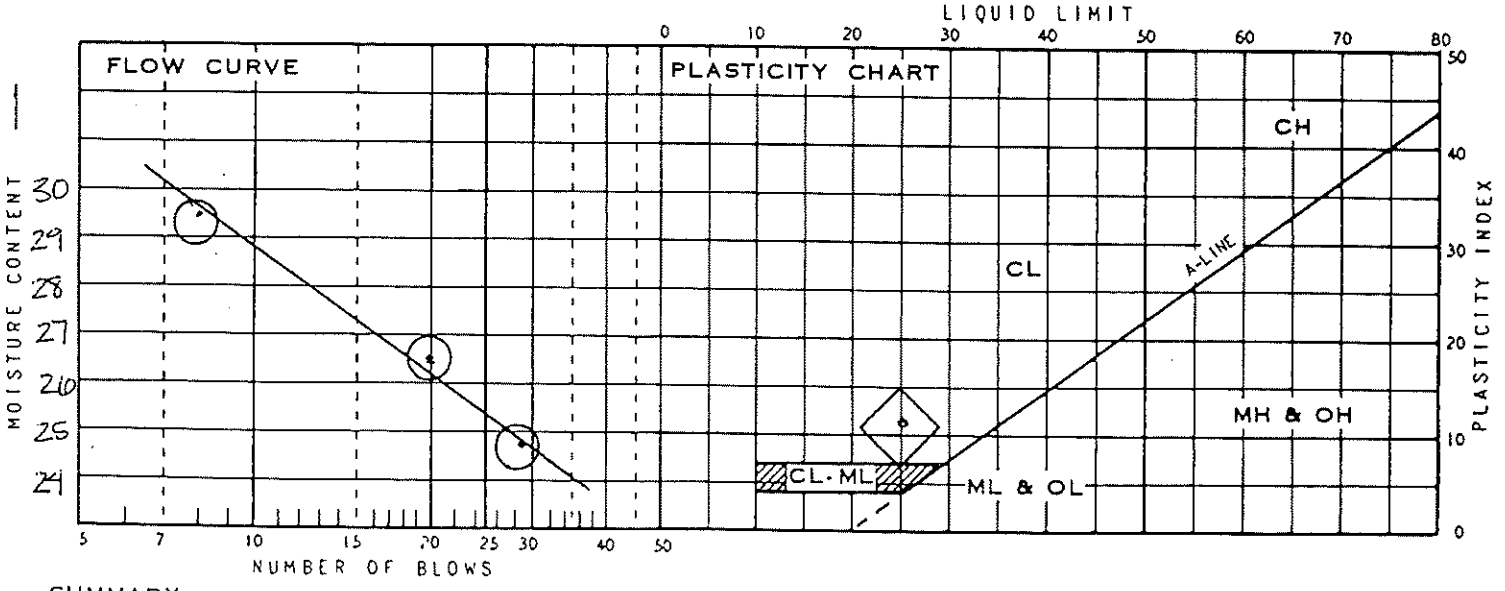
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY B.R. 9/25/97

DETERMINATION	1	2	3	4	5	6
DISH	26	10				
WT OF DISH + WET SOIL	12.31	12.47				
WT OF DISH + DRY SOIL	11.00	11.11	—	—	—	—
WT OF MOISTURE						
WT OF DISH	1.36	1.30	—	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	13.90	13.86	$\bar{X}$ = 14			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	94	16	85			
NUMBER OF BLOWS	29	20	8			
WT OF DISH + WET SOIL	13.53	12.00	11.24			
WT OF DISH + DRY SOIL	11.11	9.77	8.98	—	—	—
WT OF MOISTURE						
WT OF DISH	1.36	1.34	1.30	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	24.82	26.45	29.43			



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		25	14	11	CL	

757..

DAMES & MOORE

OWNER/LOCATION JUNKER LANDFILL — JOB NO. 33178-003

BORING NO. CHP — DATE 8/23/97

DEPTH X=8410 Y=1415 — TESTED RJH

SAMPLE NO. SAMPLE # 1 LIFT 1 (+V.) — LAB SOIL DESCRIPTION

INITIAL HEIGHT 2.00" — FINAL HEIGHT 1.929

DENSITY	BEFORE TEST	AFTER TEST
WT. SOIL & RINGS	394.6	396.8
WT. RINGS	90.7	
WT. SOIL		
WET DENSITY	126.2	131.8
DRY DENSITY	105.6	109.5
MAX. DRY DENSITY		
PERCENT COMPACTION		

MOISTURE	BEFORE TEST	AFTER TEST
WT. WET SOIL & PAN	875	495.0
WT. DRY SOIL & PAN		443.3
WT. WATER		
WT. OF PAN NO.		190.0
WT. DRY SOIL		
WATER CONTENT	19.5	20.4

SETUP NO. 8

SURCHARGE 1000

INITIAL DIAL .561

FINAL DIAL .490

$K = \frac{aL}{A\Delta t} \text{ in } \frac{h_1}{h_2}$

H=22

DATE	TIME	ELAPSED TIME (Δt)	DIAL	BURETTE READING h_1 (CC)	BURETTE READING h_2 (CC)	PERCOLATION RATE FT/YEAR	PERCOLATION RATE CM/SEC
8/23/97	1023	[illegible]	.496	0			
8/25/97	0709	1246	.494	11.4			
8/26/97	0940	1591	.491	14.8			
8/27/97	0950	1450	.491	15.7			2.40×10^{-8}
8/28/97	0936	1454	.491	16.5			2.19×10^{-8}
8/29/97	0846	1390	.490	17.4			2.55×10^{-8}
9/11/97	0913	18747	.490	31.6			3.20×10^{-8}

$K_{AV} = 2.59 \times 10^{-8}$ cm/s

PERCOLATION TEST - FALLING HEAD

Dames & Moore

CHECKED BY — DATE — BY

COMPACTION TEST DATA

PAGE NO. _____ OF _____

Dames & Moore

Job No. _____ Client VUNKEL Sample _____ Depth _____

Location EXISTING CLAY REP. SAMPLE Sampled _____ By _____

Soil _____ Passing ¼" _____ % Sp. Gr. _____

Tested 9/18/97 By EEL Computed 9/22/97 By EEL Checked _____ By _____

TYPE OF COMPACTION	CYLINDER CU. FT.	RAMMER LBS.	DROP INCHES	LAYERS	BLOWS PER LAYER
☒ ASTM D1557	1/30	10	18	5	25
☐ ASTM D1557	1/13.33	10	18	5	56
☐ ASTM D698	1/30	5½	12	3	25
☐					

POINT NO.	PENETROMETER NEEDLE SIZE	PENETROMETER RESISTANCE READING / RESISTANCE LBS./SQ.IN.	WT. OF MOLD & SOIL MOLD WT. / WT. OF SOIL	WET DENSITY IN LBS./ CU.FT.	MOISTURE DETERMINATION DISH NO.	WET WT. -DRY WT. / MOISTURE WT.	DRY WT. -DISH WT. / DRY SOIL WT.	% MOISTURE	DRY DENSITY IN LBS./ CU.FT.
As is			13.74 / 9.32	132.6	ST 17	633.5 / 588.5	210.5	11.9	118.5
+2%			13.88 / 9.32	136.8	T6	730.5 / 666.5	197.5	13.6	120.4
+4%			13.80 / 9.32	134.4	ST 5	700.5 / 636.3	224.7	15.6	116.3
+6%			13.68 / 9.32	130.8	T5	736.7 / 660.0	222.7	17.5	111.3
-2%			13.54 / 9.32	126.6	ST 14	688.9 / 645.8	212.6	9.9	115.1

959P.1 (2) (6-86)

☐ NOTES OR CALCULATIONS ON REVERSE SIDE

COMPACTION TEST DATA

PAGE NO. _____ OF _____

Dames & Moore

Job No. _____ Client JUNKEL Sample _____ Depth _____

Location _____ Sampled _____ By _____

Soil NEW IMPORTED CLAY Passing ¼" _____ % Sp. Gr. _____

Tested 9/20/91 By EGL Computed 9/22/91 By EGL Checked _____ By _____

TYPE OF COMPACTION	CYLINDER CU. FT.	RAMMER LBS.	DROP INCHES	LAYERS	BLOWS PER LAYER
☒ ASTM D1557	1/30	10	18	5	25
☐ ASTM D1557	1/13.33	10	18	5	56
☐ ASTM D698	1/30	5½	12	3	25
☐					

POINT NO.	PENETROMETER NEEDLE SIZE	PENETROMETER RESISTANCE READING / RESISTANCE LBS./SQ.IN.	WT. OF MOLD & SOIL / MOLD WT. / WT. OF SOIL	WET DENSITY IN LBS./CU.FT.	MOISTURE DETERMINATION DISH NO.	WET WT. -DRY WT. / MOISTURE WT.	DRY WT. -DISH WT. / DRY SOIL WT.	% MOISTURE	DRY DENSITY IN LBS./CU.FT.
As is			13.68 / 9.32	130.8	N5	484.8 / 434.5	160.7	18.4	110.5
+2%			13.56 / 9.32	127.2	ST 39	561.4 / 501.7	211-8	20.6	105.5
-2%			13.78 / 9.32	133.8	T16	559.6 / 513.6	221.8	15.8	115.6
-4%			13.80 / 9.32	134.4	ST 8	794.3 / 720.0	185.2	13.9	118.0
-6%			13.80 / 9.32	134.4	ST 10	874.7 / 808.6	213.0	11.1	121.0
-8%			13.66 / 9.32	130.2	T4	684.2 / 645.7	225.2	9.2	119.3

959P.1 (2) (6-86)

☐ NOTES OR CALCULATIONS ON REVERSE SIDE

OWNER, LOCATION: JUNKER LANDFILL — JOB NO. 33178-003

BOR NO NO. X=8 Y=4 — DATE 10/20/97

DEPTH — TESTED BJH

SAMPLE NO — LAB SOIL DESCRIPTION CL

INITIAL HEIGHT 2.00 — FINAL HEIGHT

DENSITY	BEFORE TEST	AFTER TEST
WT. SOIL & RINGS	399.0	400.2
WT. RINGS	90.6	90.6
WT. SOIL	308.4	310.3
WET DENSITY	128.1	129.3
DRY DENSITY	108.8	109.2
MAX. DRY DENSITY		
PERCENT COMPACTION		

MOISTURE	BEFORE TEST	AFTER TEST
WT. WET SOIL & PAN	N1	470.4
WT. DRY SOIL & PAN		422.2
WT. WATER		
WT. OF PAN NO.		161.0
WT. DRY SOIL		
WATER CONTENT	17.7	18.5

SETUP NO. 1

SURCHARGE ~~500~~ 1000

INITIAL DIAL .316

FINAL DIAL .309

$K = \frac{aL}{A\Delta t} \ln \frac{h_1}{h_2}$

H=29

DATE	TIME	ELAPSED TIME (Δt)	DIAL	BURETTE READING h_1 (CC)	BURETTE READING h_2 (CC)	PERCOLATION RATE FT/~~YEAR~~	CM/SEC
10/20	0925		.312	0			
10/21	0820	1375	.313	1.4			
10/22	0928	1508	.310	3.2			
10/23	1053	1525	.309	5.0			4.30×10^{-8}
10/25	1024	2852	.309	8.2			4.17×10^{-8}
10/27	0820	2756	.308+	11.6			4.71×10^{-8}
10/28	1230	1670	.309	13.4			4.21×10^{-8}
10/29	0659	1169	.309	14.9			5.08×10^{-8}

$K_{AV} = 4.49 \times 10^{-8}$ cm/s

PERCOLATION TEST - FALLING HEAD

Dames & Moore

MOISTURE AND DENSITY DETERMINATIONS

DAMES & MOORE

CLIENT JUNIPER LANDFILL LOCATION _____ JOB NO. _____ PAGE _____ OF _____

SAMPLE & SOIL TYPE	BORING	X=5+50 Y=0+80	X=5+00 Y=4	DITCH X=10+75 Y=14.5'	DITCH X=7+20 Y=13FT		AS IS EXISTING CUT		
	SAMPLE NO.	SAMPLE #1 LIFT=3	LIFT 3	SAMPLE 2 LIFT 1	Sample 3 LIFT 3		BULK		
	SAMPLE DEPTH								
	DATE SAMPLED BY								
	DATE TESTED BY								
	SOIL TYPE								
	LABORATORY IDENTIFICATION H=	6"-2.17	6"-1.17"	6"-1.13	6"-1.06				
DENSITY	NO. OF RINGS D=	2.42	2.42	2.42	2.42				
	WT. OF WET SOIL & RINGS	858.9	1039.8	1056.0	1044.2				
	WT. OF RINGS	268.7	273.0	273.9	271.2				
	WT. OF WET SOIL	590.2	766.8	782.1	773.0				
	WET DENSITY (LBS./CU.FT.)	128.0	131.9	133.4	130.0				
	DRY DENSITY (LBS./CU.FT.)	106.8	113.8	115.8	112.7				
MOISTURE CONTENT	DISH NO.	A-4	L-8	A3	E3		ST43		
	WT. OF WET SOIL & DISH	198.8	165.8	192.3	198.0		549.4		
	WT. OF DRY SOIL & DISH	173.0	149.0	172.7	177.5		487.3		
	NET LOSS OF MOISTURE								
	WT. OF DISH	43.4	43.4	43.5	43.8		212.2		
	WT. OF DRY SOIL								
	MOISTURE CONTENT (% DRY WT.)	19.9	15.9	15.2	15.3		22.6		

Junker Landfill

CP

~~Ditch~~ Sample 2 lift 3 — field
x=5+50, y=0+80

Wt soil and dish			269.1
Dry soil & dish			252.04
dish			160.79
Moisture Content =	18.70 %	H	0
Wet Density =	ERR PCF	A	0
Dry Density =	ERR PCF	Ws	0
		For HA	258.24

SIEVE & HYDROMETER ANALYSIS

SIEVE PORTION

Total Sample	1118.59 g
Dry weight split-3/8"=	217.6 g
sample split -#10 sieve =	77.78 g

Sieve #	Weight Retained	Total Percent Finer
1.5 inch	0	100.00%
3/4 inch	0	100.00%
3/8 inch	0	100.00%
# 4	0.56	99.74%
# 10	3.35	98.46%
# 20	2.4	95.42%
# 40	8.41	87.81%
# 60	19.5	73.77%
# 100	24.67	67.23%
# 200	28.17	62.80%

Constants this test
Gs= 2.65 20c=.01365 21c=.01348 22c=.01332
18c=.01399 19c=.01382
When 5 grams of Sodium Hexametaphosphate used correction = 6

HYDROMETER ANALYSIS

Elapsed time	Tc	R'	Zr	Particle Dia. mm	Percent Partial	Total Percent Finer
0.5	21	54	7.39	0.0531	61.72	60.77
1	21	50	8.05	0.0392	56.57	55.70
2	21	47.5	8.46	0.0284	53.36	52.54
5	21	43.9	9.06	0.0186	48.73	47.98
15	21	40.8	9.57	0.0110	44.74	44.05
30	21	38.3	9.98	0.0080	41.53	40.89
60	21	36.1	10.34	0.0057	38.70	38.10
120	21	34.2	10.66	0.0041	36.26	35.70
250	21	32.6	10.92	0.0029	34.20	33.67
500	21	30.3	11.30	0.0021	31.24	30.76
1440	21	29	11.52	0.0012	29.57	29.12

MECHANICAL ANALYSIS

SA ☐ HA ☑ BLK SA ☐ -#200 ☐

OWNER/CLIENT _____ JOB NUMBER 7111-19-001

LOCATION/PROJECT _____ DATE 8-23-97

BORING _____ SAMPLE #2 lift 3 DEPTH X = 5+170 Y = 0+80 BY _____

DENSITY		MOISTURE ANALYSIS	MC 1	MC 10	EH 10	
HEIGHT= DIAMETER=		PAN	N11	H3	E3	
NUMBER OF RINGS		WT. OF PAN & WET SOIL	209.1	85.53	54.93	
WT. OF RINGS & WET SOIL		WT. OF PAN & DRY SOIL	252.04	84.37	54.13	
WT. OF RINGS		WT. OF MOISTURE				
WT. OF WET SOIL		WT. OF PAN	160.79	43.60	21.27	
FIELD DENSITY		WT. OF DRY SOIL				
DRY DENSITY		MOISTURE CONTENT %	18.7			

WET SAMPLE	17		
WT. OF WET SAMPLE & PAN	294.5		
WT. OF PAN	310.20		
WT. OF WET SOIL			
WT. OF SAMPLE/ OVEN DRIED			

FIELD SAMPLE CONTAINER	
total weight = 1118.59	
DRY SIEVE	WASH SIEVE

SAMPLE SPLIT ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

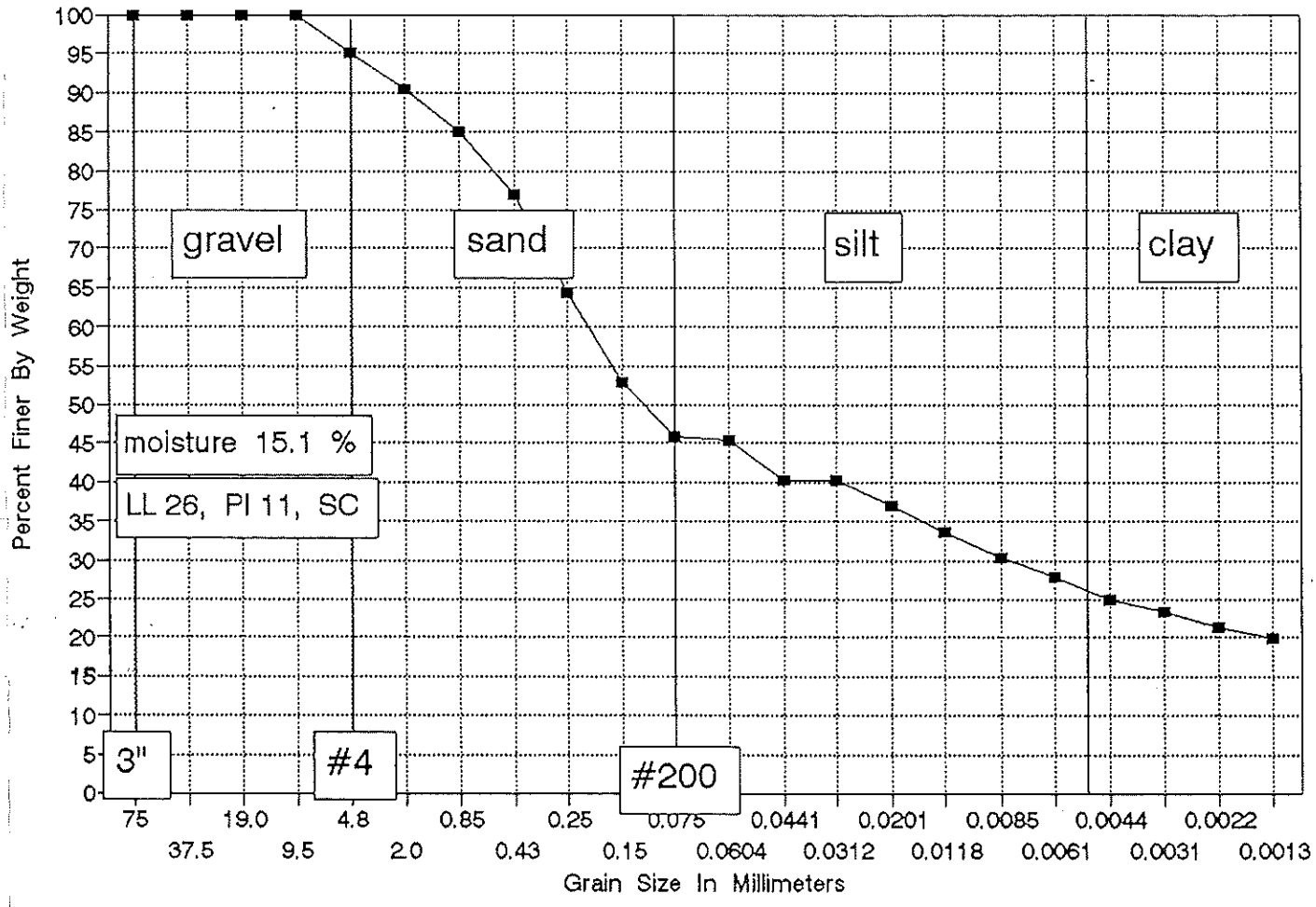
PAN NUMBER	PAN WEIGHT	SIEVE NUMBER	WEIGHT RETAINED	ACCUMULATIVE WEIGHT RETAINED	ACCUMULATIVE PERCENT PARTIAL RETAINED	ACCUMULATIVE PERCENT PARTIAL FINER	ACCUMULATIVE PERCENT TOTAL FINER
		3"					
		1-1/2".					
		3/4"					
		3/8"		0			
		#4		.56			
		#10		3.35			
N7		#20		2.40			
		#40		8.41			
		#60		19.50			
		#100		24.67			
		#200		28.17			

NOTE: BB

Dames & Moore

GRADATION CURVE

Ditch sample lift 3, x=8+50, y=11



ST-11

HYDROMETER ANALYSIS

OWNER JUNIPER LANDFILL JOB NO. 331-19-[illegible] DATE 6/15/17

BORING NO. DITCH LIFT #3 X=6+50 Y=11

SAMPLE SPECIMEN NO. | CLASSIFICATION

DISH NO. | GRADUATE NO. 4 | HYDROMETER NO. 152H

DISPERSING AGENT USED SODIUM HEXA META PHOSPHATE ; QUANITY 5.00 GRAMS

DISPERSING AGENT CORRECTION, C_D 5 ; MENISCUS CORRECTION, C_M = 1

TIME	ELAPSED TIME	TEMP °C	HYDRO READING (R')	CORRECTED READING $R+C_M-C_D$	HEIGHT Z_R	PARTICLE DIA. (MM)	PERCENT FINER PARTIAL	PERCENT FINER TOTAL
0420								
	15	21°	44					
	1	21°	41					
	2	21°	37					
	5	21°	34.5					
	15	21°	32					
	30	21°	29.4					
	60	21°	27.5					
	120	21°	25.2					
	250	21°	24					
	500	21°	22.5					
0420		21°	21.3					

WEIGHT IN GRAMS

DISH PLUS DRY SOIL

DISH

DRY SOIL W_O

SPECIFIC GRAVITY OF SOLIDS, G_S =

CORRECTED HYDROMETER READING (R) = HYDROMETER READING (R') + C_M

(WET) 647.24 - 575.95

THE PARTICLE DIAMETER (D) IS CALCULATED FROM STOKE'S EQUATION USING CORRECTED HYDROMETER READING. USE NOMOGRAPHIC CHART FOR SOLUTION OF STOKE'S EQUATION.

HYDROMETER GRADUATED IN SPECIFIC GRAVITY

$$\text{PARTIAL PERCENT FINER} = \frac{G_S}{G_S - 1} \times \frac{100}{W_O}(R - C_D + M)$$

HYDROMETER GRADUATED IN GRAMS PER LITER

$$\text{PARTIAL PERCENT FINER} = \frac{100}{W_O}(R - C_D + M)$$

W_S = TOTAL OVEN-DRY WT. OF SAMPLE USED FOR COMBINED ANALYSIS

W_O = OVEN-DRY WT. IN GRAMS OF SOIL USED FOR HYDROMETER ANALYSIS

W_1 = OVEN-DRY WT OF SAMPLE RETAINED ON NO. 200 SIEVE

$$\text{TOTAL PERCENT FINER} = \text{PARTIAL PERCENT FINER} \times \frac{W_S - W_1}{W_S}$$

REMARKS

TECHNICIAN PJH COMPUTED BY _____ CHECKED BY EAL

URAQT FORM 1040-A
2-31-75

ATTERBERG LIMITS TEST DATA

FIELD CLASSIFICATION _____

LABORATORY CLASSIFICATION _____

JOB NO. 55[illegible]

CLIENT/OWNER [illegible]

LOCATION [illegible]

BORING [illegible] SAMPLE [illegible] DEPTH _____

FIELD DENSITY

DETERMINATION	1	2
NUMBER OF RINGS		
WT OF RINGS + WET SOIL		
WT OF RINGS	—	—
WT OF WET SOIL		
FIELD DENSITY		
DRY DENSITY		

THIS IS AN 1/8-INCH THREAD [redacted]

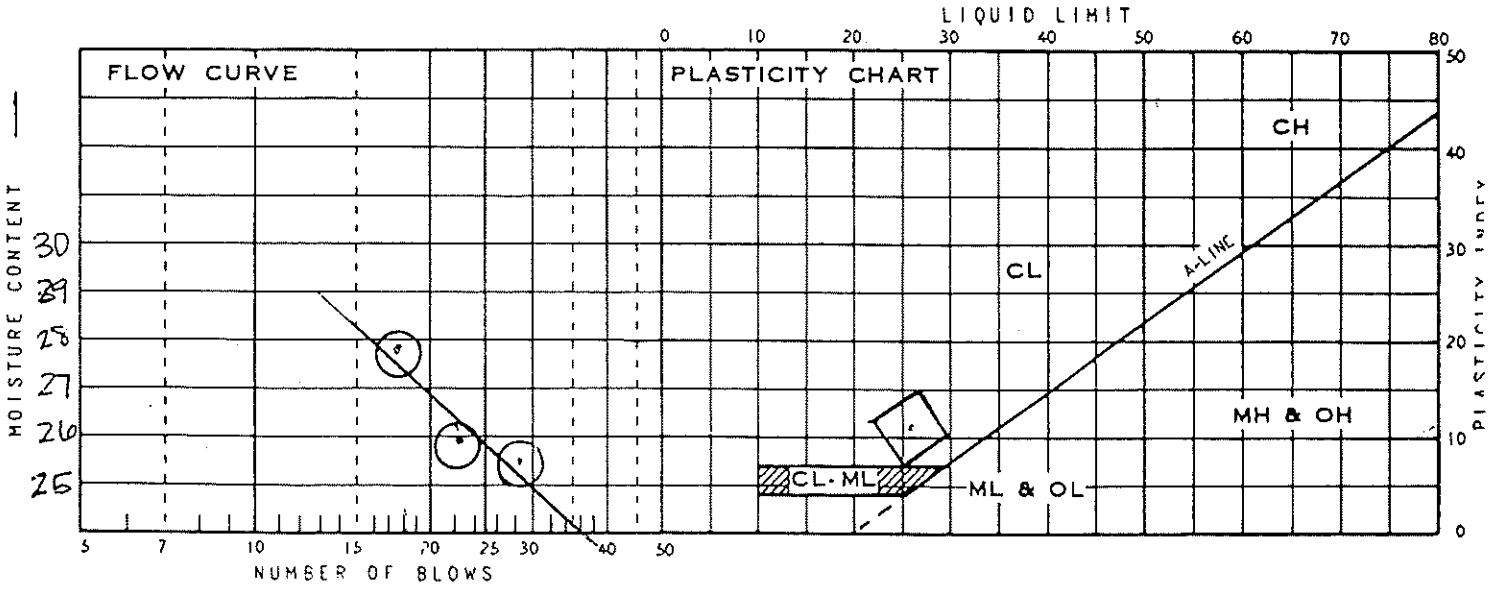
DETERMINATION	1	2
DISH		
WT OF DISH + WET SOIL		
WT OF DISH + DRY SOIL	—	—
WT OF MOISTURE		
WT OF DISH	—	—
WT OF DRY SOIL		
FIELD MOISTURE CONTENT		

PLASTIC LIMIT BY RP 8/25/17

DETERMINATION	1	2	3	4	5	6
DISH	57	53				
WT OF DISH + WET SOIL	10.67	11.08				
WT OF DISH + DRY SOIL	9.99	9.85	—	—	—	—
WT OF MOISTURE						
WT OF DISH	1.36	1.37	—	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	14.51	14.50	$\bar{X}$= 15			

LIQUID LIMIT

DETERMINATION	1	2	3	4	5	6
DISH	12	240	81			
NUMBER OF BLOWS	29	23	18			
WT OF DISH + WET SOIL	12.92	11.05	8.58			
WT OF DISH + DRY SOIL	10.58	9.05	7.00	—	—	—
WT OF MOISTURE						
WT OF DISH	1.38	1.35	1.34	—	—	—
WT OF DRY SOIL						
MOISTURE CONTENT	25.43	25.97	27.92			



SUMMARY

DRY DENSITY	MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	IDENTIFICATION	
		26	15	11	CL	

RP

DAMES & MOORE

Junker Landfill

field

Ditch Sample 1 lift 2
x=3+55, y=13 ft

Wt soil and dish 114.2
Dry soil & dish 99.6
dish 43.6

Moisture Content = 26.07 %
Wet Density = ERR PCF
Dry Density = ERR PCF

H 0
A 0
Ws 0

For HA 243.9

SIEVE & HYDROMETER ANALYSIS

SIEVE PORTION
Total Sample 1002.7 g
Dry weight split-3/8"= 193.5 g
sample split -#10 sieve = 59.22 g

Sieve #	Weight Retained	Total Percent Finer
1.5 inch	0	100.00%
3/4 inch	0	100.00%
3/8 inch	0	100.00%
# 4	1.52	99.21%
# 10	5.95	96.92%
# 20	1.66	94.21%
# 40	4.39	89.74%
# 60	8.81	82.50%
# 100	13.79	74.35%
# 200	18.3	66.97%

Constants this test
Gs= 2.65 20c=.01365 21c=.01348 22c=.01332
18c=.01399 19c=.01382
When 5 grams of Sodium Hexametaphosphate used correction = 6

HYDROMETER ANALYSIS

Elapsed time	Tc	R'	Zr	Particle Dia. mm	Percent Partial	Total Percent Finer
0.5	21	46	8.71	0.0577	67.55	65.47
1	21	45	8.88	0.0412	65.86	63.84
2	21	42	9.37	0.0299	60.79	58.92
5	21	39	9.87	0.0194	55.73	54.01
15	21	37	10.20	0.0114	52.35	50.74
30	21	35.1	10.51	0.0082	49.14	47.63
60	21	33.3	10.81	0.0059	46.10	44.68
120	21	31.3	11.14	0.0042	42.73	41.41
250	21	30.2	11.32	0.0029	40.87	39.61
500	21	28.6	11.58	0.0021	38.17	36.99
1440	21	27.1	11.83	0.0013	35.63	34.54

MECHANICAL ANALYSIS

SA ☒ HA ☒ BLK SA ☐ -#200 ☐

OWNER/CLIENT JUNIPER LANDFILL JOB NUMBER 97-176-003

LOCATION/PROJECT (DITCH) X=2155 Y=13FT DATE 8/22/97

BORING S# 1 LIFT 2 SAMPLE BAG DEPTH _____ BY RJH/BRR

DENSITY	
HEIGHT= DIAMETER=	
NUMBER OF RINGS	
WT. OF RINGS & WET SOIL	
WT. OF RINGS	
WT. OF WET SOIL	
FIELD DENSITY	
DRY DENSITY	

MOISTURE ANALYSIS	MC	#10	#10	
PAN	E4	E4	K	
WT. OF PAN & WET SOIL	114.12	65.17	54.85	
WT. OF PAN & DRY SOIL	99.6	64.53	53.96	
WT. OF MOISTURE				
WT. OF PAN	43.6	43.73	21.31	
WT. OF DRY SOIL				
MOISTURE CONTENT %	26.1			

WET SAMPLE	11		
WT. OF WET SAMPLE & PAN	294.3		
WT. OF PAN	50.4		
WT. OF WET SOIL			
WT. OF SAMPLE/ OVEN DRIED			

FIELD SAMPLE CONTAINER	
1002.7 gr	
DRY SIEVE	WASH SIEVE

SAMPLE SPLIT

PAN NUMBER	PAN WEIGHT	SIEVE NUMBER	WEIGHT RETAINED	ACCUMULATIVE WEIGHT RETAINED	ACCUMULATIVE PERCENT PARTIAL RETAINED	ACCUMULATIVE PERCENT PARTIAL FINER	ACCUMULATIVE PERCENT TOTAL FINER
		3"					
		1-1/2".					
		3/4"					
		3/8"		0			
		#4		1.52			
		#10		5.95			
NA		#20		1.66			
		#40		4.39			
		#60		8.81			
		#100		13.79			
		#200		18.30			

NOTE: F

Dames & Moore

APPENDIX G

SYSTEM AND GROUNDWATER DATA AFTER STARTUP

DAILY FIELD REPORT

PROJECT NAME Junker Landfill DATE 10/22/97

PROJECT NO. JUNKE9601.01 WEATHER Partly Cloudy @ 40° F

PROJECT LOCATION Hudson, WI

OBSERVATIONS

B. Kent onsite to determine oxygen problems at system flare and meet with Pinky's (condensate hauler) to have condensate removed.

- monitored pressures and gas levels at system. Methane levels appear low (42.5%) and oxygen is still high (4.7%). Flow rate is high compared to similar vacuum applied from historical data and current well head settings.

- monitored all open well heads for pressures, temperatures, and gas level and confirmed no leaks existed. Also, inspected all closed well heads to confirm they were closed and had no leaks. Gas levels at all open well heads did not indicate high oxygen levels (all were < 0.2 %). Vacuum levels at GEW-9, 10, 11, 12 are low compared to historical data for similar header vacuums at the system. This may indicate line breakage at the manhole or interior landfill piping. Vacuum levels at GEW-5, 6, 7, and 8 also decrease as they near the manhole which further supports the possibility of line breakage.

- inspection of the western manhole on Alexander Rd. indicates that there is line breakage within the manhole. Exact verification of pipe sizes will be determined during the next visit. Inspection of the eastern manhole was not possible due to lack of necessary tools. This manhole will be inspected during the next visit.

- checked to see if the high fluid level and high level shut off floats in the condensate tank worked. Actuation of the floats indicated that none of the indicator warnings worked and did not shut the system down. In addition, when the system is shut down the condensate pumps do not shut down. These must be turned off manually in the control panels on the cap.

- The former leachate head well LHW-4 is now labeled LEW-1. The 2" leachate observation well constructed with LEW-1 is now labeled LHW-4. These new labels along with GEW-20 and 21 will be reflected on new field data reports. GEW-19 pertains strictly to LFG extraction and will also be added to the appropriate tables.

- Pinky's pumped and hauled approximatelly 3327 gallons of leachate from the condensate tank.

- adjusted the sensitivity on the Coyote™ controllers for extraction pump operation.

- shut LFG extraction system and leachate extraction system down.

- measure leachate level in LHW-4 (2" observation well installed with LEW-1). Cannot measure leachate level in GEW-20, 21, and LEW-1 due to access through well cap.

Time Arrived 9:00 am Time Departed 3:00 pm

Signature Eric L Kent

DAILY FIELD REPORT

PROJECT NAME Junker Landfill DATE 10/24/97

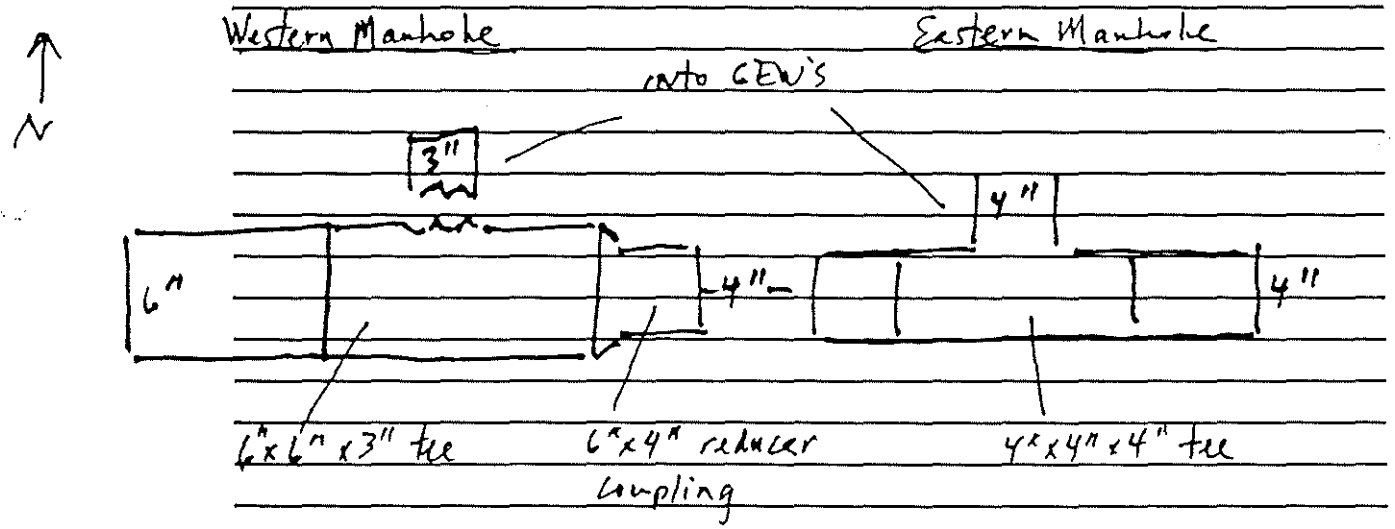
PROJECT NO. JUNKE9601.01 WEATHER Cloudy @ 35° F

PROJECT LOCATION Hudson, WI

OBSERVATIONS

Brian Kent onsite to determine pipe dimensions of broken line in the western manhole along Alexander Road. Also inspected eastern manhole piping to determine if line breakage has occurred.

- the western manhole piping consists of a 6" x 6" x 3" HDPE tee. 6" pipe extends west from the tee. East from the tee the pipe is reduced via a HDPE reducer coupling to 4" HDPE. The tee extending into the interior of the landfill is 3" HDPE. The break exists where the 3" attaches to the 6" pipe and is seperated approximately 6-8". The piping arrangement is illustrated below.
- the eastern manhole didn't indicate line breakage within the manhole. When I replaced the manhole lid, however, a definate vacuum was being applied to the manhole. This vacuum could be coming from a broken line within the landfill that is short circuiting along the secondary containment piping, short circuiting from the western manhole along the secondary containment pipe, or possibly influence from nearby extraction wells. The piping arrangement is HDPE pipe with a 4" x 4" x 4" tee which is also illustrated below.
- I turned the system on to determine problems and shut it down prior to leaving the site.



* break occurred at tee not in the line.

Time Arrived 8:00 am Time Departed 10:00 am

Signature Brian Kent

TABLE 1

SYSTEM MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	HEADER LINE VACUUM (In. H20)	BLOWER INLET VACUUM (In. H20)	BLOWER DISCHARGE PRESSURE (In. H20)	GAS TO FLARE						VELOCITY (ft./min)	TOTAL GAS FLOW (cubic feet/min)	COMMENTS	BY:
						PRESSURE (In. H20)	TEMP. (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %				
04/24/96	51	29.72 F	-9.50	-35.0	+0.80	NR	79	31.0	NR	0.3	NR	1140	203		BLK
05/01/96	68	29.81 S	-8.50	-35.0	+0.75	-0.10	95	28.0	NR	0.4	NR	1045	205		BLK
05/06/96	46	30.35 F	-9.30	-35.0	+0.75	-0.06	78	46.5	37.4	0.0	16.1	969	190		BLK
05/06/96	46	30.35 F	-6.00	-35.5	+0.77	-0.08	85	45.4	36.9	0.0	17.7	1122	220	after adjustments	BLK
05/15/96	55	29.85 F	-7.91	-35.5	+0.64	-0.08	88	44.8	36.1	0.0	19.1	1030	202		BLK
05/20/96	67	29.71 R	-6.73	-34.0	+0.67	-0.01	95	41.0	35.0	0.1	23.9	1056	207		BLK
05/30/96	70	30.21 S	-8.60	-35.0	+0.23	-0.06	106	47.7	36.5	0.7	15.1	944	185	decr. header line vac.	BLK
06/04/96	45	29.04 F	-8.84	-34.5	+0.49	-0.09	98	44.3	35.1	0.0	20.6	924	181		BLK
06/11/96	71	28.95 F	-8.65	-34.5	+0.46	-0.07	105	45.7	40.2	0.0	14.1	918	180	pre-adjustments	BLK
06/11/96	71	28.95 F	-6.30	-31.5	+0.60	-0.07	111	51.7	42.3	0.1	5.9	1010	198	after extraction well balance	BLK
06/13/96	77	29.04 F	-6.30	-32.0	+0.56	-0.33	106	52.5	36.7	0.3	10.5	1046	205		BLK
06/19/96	63	29.89 R	-7.31	-33.5	+0.58	-0.06	106	36.6	29.7	1.9	31.8	1061	208		BLK
06/19/96	63	29.89 R	-11.20	-33.5	+0.41	-0.06	106	45.2	34.8	1.0	19.0	791	155	after adjustments	BLK
06/25/96	78	30.11 S	-11.21	-33.0	+0.38	-0.04	123	47.3	34.0	0.2	18.5	791	155		BLK
07/01/96	73	30.04 R	-10.90	-33.0	+0.42	-0.08	111	49.1	36.7	0.2	14.0	913	179		BLK
07/09/96	58	30.04 R	-11.60	-33.0	+0.44	-0.07	106	47.4	35.6	0.2	16.8	893	175		CU
07/16/96	79	29.95 F	-11.40	-33.0	+0.38	-0.07	110	47.2	35.1	0.2	17.5	893	175		BLK
07/16/96	79	29.95 F	-8.75	-30.0	+0.40	-0.07	129	55.4	37.7	0.3	6.6	842	165	after adjustments	BLK
07/24/96	66	29.90 R	-9.24	-33.0	+0.41	-0.07	112	45.2	35.1	0.2	19.5	740	145		BLK
07/30/96	70	30.10 S	-7.56	-33.0	+0.32	-0.07	116	47.1	33.8	0.1	19.0	765	150		BLK
08/06/96	77	29.89 F	-7.61	-32.5	+0.31	-0.07	119	45.2	34.1	0.1	20.6	791	155		BLK
08/13/96	72	29.96 F	-7.65	-33.0	+0.36	-0.07	111	45.4	34.3	0.1	20.2	765	150		BLK
08/14/96	71	29.98 R	-8.04	-32.0	+0.38	-0.07	113	81.8	17.9	0.3	0.0	816	160		BLK
08/20/96	70	30.20 R	-8.42	-32.0	+0.30	-0.07	114	53.6	37.5	0.2	8.7	816	160		BLK
08/27/96	64	30.10 S	-8.40	-33.0	+0.42	-0.07	114	54.4	373	0.2	8.1	765	150		BLK
09/03/96	74	29.95 R	-8.25	-32.5	+0.35	-0.07	118	52.7	37.2	0.2	9.9	791	155		BLK
09/09/96	59	30.02 R	-6.10	-32.5	+0.46	-0.08	108	48.9	35.9	0.2	15.0	918	180		CAU

g:junker\ommoct

TABLE 1 (cont.)

SYSTEM MONITORING

SEH INC.

JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	HEADER LINE VACUUM (In. H20)	BLOWER INLET VACUUM (In. H20)	BLOWER DISCHARGE PRESSURE (In.. H20)	GAS TO FLARE						VELOCITY (ft./min)	TOTAL GAS FLOW (cubic feet/min)	COMMENTS	BY:
						PRESSURE (In. H20)	TEMP. (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %				
03/25/97	35	29.54 R	-12.70	-29.5	+0.40	-0.08	81	45.7	35.4	0.2	18.7	791	155		BLK
04/01/97	57	30.03 F	-12.10	-29.5	+0.40	-0.08	101	44.8	35.1	0.2	19.9	816	160		BLK
04/08/97	22	30.45 R	-11.70	-30.0	+0.41	-0.08	84	44.6	35.1	0.1	20.2	867	170		BLK
04/15/97	44	29.99 R	-11.60	-30.5	+0.46	-0.07	91	45.1	35.2	0.2	19.5	867	170		BLK
04/22/97	43	29.91 S	-11.60	-30.0	+0.40	-0.07	88	45.1	34.6	0.2	20.1	867	170		BLK
04/29/97	56	29.69 F	-11.10	-30.0	+0.46	-0.07	98	46.1	34.4	0.0	19.5	867	170		BLK
05/08/97	53	29.76 S	-11.20	-29.5	+0.42	-0.07	96	48.8	35.4	0.1	15.7	867	170		BLK
05/13/97	41	29.76 F	-11.40	-29.0	+0.46	-0.07	96	46.2	36.6	0.2	17.0	867	170		BLK
05/20/97	52	30.20 S	-12.30	-29.5	+0.43	-0.07	97	44.3	34.1	0.1	21.5	842	165		BLK
05/27/97	61	30.34 F	-13.30	-29.5	+0.43	-0.08	106	46.3	34.5	0.1	19.1	816	160		BLK
06/04/97	74	30.03 F	-13.30	-29.0	+0.42	-0.07	116	44.7	35.0	0.1	20.2	816	160		BLK
06/11/97	73	30.02 S	-12.90	-29.0	+0.43	-0.07	115	47.9	36.0	0.1	16.0	816	160		BLK
06/17/97	69	29.82 F	-10.30	-29.0	+0.42	-0.07	108	45.9	34.6	0.1	19.4	893	175		CAU
06/24/97	75	29.76 F	-10.10	-29.0	+0.42	-0.07	105	46.9	35.3	0.1	17.7	867	170		BLK
06/24/97	SHUT DOWN BLOWER/FLARE FOR CAP CONSTRUCTION ACTIVITIES. GEW'S ALLOWED TO VENT @ FLARE.														BLK
10/22/97	39	30.16 R	-10.30	-28.5	+1.83	-0.03	82	42.5	29.4	4.7	23.4	1571	308		BLK

NOTE:

(1) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.

(2) Gas velocity converted to gas flow by multiplying fpm x 0.196 for 6 inch pipe; velocities measured with an anemometer.

(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.

NA - Not Available or Not Applicable NC - No Change from initial setting NR - No Reading

Prepared By ESZ 10/23/97

Checked By

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-4

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-7.45	-0.19	50	34.3	32.3	0.0	33.4	0	0	0.0	0.0	1	474	BLK
05/30/96	70	30.21 S	-6.20	-0.28	67	29.2	30.9	0.6	39.3	1	452	22.2	6.5	0	0	BLK
06/11/96	71	28.95 F	-6.00	-0.22	69	58.2	41.5	0.0	0.3	0	0	0.0	0.0	1	980	BLK
06/19/96	63	29.89 R	-6.00	-0.44	NA	27.5	27.9	1.0	43.6	1	NA	NA	NA	0	0	BLK
07/16/96	79	29.95 F	-8.48	-0.46	68	41.0	30.8	1.5	26.7	0	0	0.0	0.0	0	NC	BLK
08/13/96	71	29.96 F	-5.69	+0.02	66	56.7	34.6	1.4	7.3	0	0	0.0	0.0	0	NC	BLK
09/17/96	50	30.29 R	-3.71	-0.40	58	40.7	30.7	1.3	27.3	0	0	0.0	0.0	0	NC	BLK
10/15/96	50	29.91 S	-4.55	-0.37	63	52.2	33.8	0.8	13.2	0	0	0.0	0	1 - 0.5	180	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-6.74	-0.84	59	44.0	33.1	0.0	22.9	30	13.2	12	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-9.20	-0.10	50	31.2	29.8	0.0	39.0	11	3.4	5		BLK
01/21/97	33	29.68 F	-9.04	+0.21	50	57.6	37.3	0.0	5.1	1	0.6	7		BLK
02/19/97	17	30.21 R	-9.50	-0.30	50	22.1	27.9	0.0	50.0	7	1.5	0		BLK
03/18/97	32	30.54 R	-8.50	-0.28	40	18.2	25.3	0.1	56.4	0	0.0	NC		BLK
04/22/97	43	29.91 S	-10.40	-0.04	50	50.6	35.8	0.0	13.6	0	0.0	3		BLK
05/20/97	52	30.20 S	-12.20	-0.29	50	26.9	28.5	0.1	44.5	2	0.5	0		BLK
06/11/97	73	30.02 S	-11.30	+0.14	58	58.5	39.0	0.3	2.2	0	0.0	2		BLK
10/22/97	39	30.16 R	-7.65	+0.07	55	57.0	37.0	0.1	5.9	3	1.7	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/23/97
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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-6

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-7.12	-0.18	48	37.8	36.7	0.0	25.5	1	170	8.3	3.2	1	NC	BLK
05/30/96	70	30.31 S	-8.94	0.00	74	60.5	38.3	0.2	1.0	1	280	13.7	8.3	1	NC	BLK
06/11/96	71	28.95 F	-4.36	-0.08	73	58.4	41.6	0.0	0.0	1	250	12.3	7.2	1	NC	BLK
07/16/96	79	29.95 F	-12.45	-0.62	78	35.4	33.4	0.3	30.9	1	550	27.0	9.6	0	0	BLK
08/13/96	71	29.96 F	-5.51	-0.06	72	59.2	40.6	0.2	0.0	0	0	0.0	0.0	1	300	BLK
09/17/96	50	30.29 R	-3.49	-0.96	56	34.6	33.1	0.0	32.3	1	425	20.9	7.2	0	0	BLK
10/15/96	50	29.91 S	-4.91	-0.41	58	46.2	36.5	0.2	17.1	0	0	0.0	0.0	1 - 0.5	230	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-3.56	-0.62	54	36.2	32.5	0.0	31.3	0-7	0-2.5	0.0	Surging/Accu-flow well head installed	BLK
12/17/96	NO READING - FROZEN LATERAL PIPING													BLK
01/21/97	NO READING - FROZEN LATERAL PIPING													BLK
02/19/97	NO READING - FROZEN LATERAL PIPING													BLK
03/18/97	NO READING - FROZEN LATERAL PIPING													BLK
04/01/97	57	30.03 F	-8.42	-0.15	60	57.5	42.0	0.0	0.5	0	0	7.0	Lateral piping thawed	BLK
04/22/97	43	29.91 S	-6.50	-0.36	50	48.4	36.0	0.1	15.5	7	3.4	NC	Surging	BLK
05/21/97	60	30.36 F	-10.80	-0.51	50	43.1	35.2	0.1	21.6	7	3.0	5.0	Surging	BLK
06/11/97	73	30.02 S	-9.30	-0.11	51	46.7	37.4	0.1	15.8	3	1.4	NC		BLK
10/22/97	39	30.16 R	-3.29	-0.07	55	58.1	41.2	0.1	0.6	2	1.2	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/23/97
Checked By

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-8

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
04/24/96	51	29.72 F	-4.50	-2.50	64	34.0	NR	0.2	NR	2	840	41.2	14.0	2	NC	BLK
05/06/96	46	30.35 F	-4.38	-2.93	63	48.4	38.0	0.6	13.0	2	755	37.1	17.9	2	NC	BLK
05/30/96	70	30.21 S	-3.94	-2.33	74	50.4	35.8	2.8	11.0	2	840	41.2	20.8	1	430	BLK
06/11/96	71	28.95 F	-2.23	-0.67	80	52.7	42.9	0.9	3.5	1	415	20.4	10.7	1	NC	BLK
06/19/96	63	29.89 R	-8.37	-0.02	NA	38.6	30.4	4.1	26.9	1	NA	NA	NA	0	0	BLK
06/25/96	78	30.11 S	-8.44	-2.73	82	51.8	36.6	2.1	9.5	0	0	0.0	0.0	1	880	BLK
07/16/96	79	29.95 F	-9.25	-3.83	79	43.3	33.7	3.2	19.8	1	1010	49.6	21.5	0	0	BLK
07/24/96	66	29.90 R	-4.51	-0.76	73	55.9	40.3	0.6	3.2	0	0	0.0	0.0	1	350	BLK
08/13/96	71	29.96 F	-3.20	-0.47	82	55.6	40.8	0.8	2.8	1	400	19.6	10.9	1	NC	BLK
09/17/96	50	30.29 R	-6.48	-2.25	67	50.5	38.8	0.0	10.7	1	480	23.6	11.9	1	NC	BLK
10/15/96	50	29.91 S	-5.35	-1.93	74	48.7	36.5	1.4	13.4	1	560	27.5	13.4	1 - 0.5	340	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-6.49	-2.63	63	50.0	38.3	0.0	11.7	25	12.5	NC	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-5.04	-3.04	63	60.8	38.9	0.0	0.3	23	14.0	30		BLK
01/21/97	33	29.68 F	-4.89	-3.04	62	55.8	39.1	0.0	5.1	28	15.6	28		BLK
02/19/97	17	30.21 R	-5.35	-3.60	60	49.3	38.4	0.0	12.3	28	13.8	NC		BLK
03/18/97	32	30.54 R	-4.60	-3.82	62	46.0	36.2	0.0	17.8	30	13.8	22		BLK
04/22/97	43	29.91 S	-6.90	-2.30	65	45.0	35.8	0.0	19.2	22	9.9	15		BLK
05/21/97	60	30.36 F	-11.00	-2.50	65	46.2	36.6	0.1	17.1	20	9.2	NC		BLK
06/11/97	73	30.02 S	-8.50	-1.80	65	48.5	38.5	0.1	12.9	13	6.3	NC		BLK
10/22/97	39	30.16 R	-3.48	-2.64	65	59.4	40.5	0.1	0.0	21	12.5	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.

NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/27/97
Checked By

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-10

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
04/24/96	51	29.72 F	-3.00	-1.95	79	33.0	NR	0.2	NR	3	1100	54.0	17.8	3	NC	BLK
05/06/96	46	30.35 F	-3.16	-1.83	77	48.4	37.8	0.3	13.5	3	920	45.2	21.9	3	NC	BLK
06/11/96	71	28.95 F	-2.51	-1.49	90	49.9	41.5	0.0	8.6	3	1050	51.6	25.7	3	NC	BLK
07/16/96	79	29.95 F	-1.92	-0.70	91	40.9	30.4	2.7	26.0	3	760	37.3	15.3	1	295	BLK
08/13/96	71	29.96 F	-1.98	-0.29	89	54.2	37.8	1.3	6.7	1	505	24.8	13.4	1	NC	BLK
09/17/96	50	30.29 R	-5.61	-1.10	74	55.3	38.9	0.0	5.8	1	510	25.0	13.8	1	NC	BLK
10/15/96	50	29.91 S	-5.29	-0.82	82	50.9	36.9	1.3	10.9	1	570	28.0	14.2	1 - 0.5	470	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-5.56	-1.20	79	55.2	38.0	0.0	6.8	18	9.9	24	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-4.96	-1.46	79	58.2	37.1	0.0	4.7	22	12.8	30	Surging water	BLK
01/21/97	33	29.68 F	-3.57	-1.36	78	56.0	39.0	0.0	5.0	30	16.8	30		BLK
02/19/97	17	30.21 R	-4.08	-2.81	75	47.8	36.6	0.0	15.6	27	12.9	30		BLK
03/18/97	32	30.54 R	-3.50	-2.70	75	46.2	35.3	0.0	18.5	30	13.9	20	Surging	BLK
04/22/97	43	29.91 S	-7.36	-1.61	75	45.2	35.9	0.1	18.8	20	9.0	15	Surging	BLK
05/21/97	60	30.36 F	-10.50	-1.80	76	45.3	35.8	0.1	18.8	15	6.8	NC	Surging	BLK
06/11/97	73	30.02 S	-8.10	-1.00	78	46.3	36.5	0.1	17.1	17	7.9	NC		BLK
10/22/97	39	30.16 R	-1.88	-1.50	80	58.7	40.7	0.1	0.5	22	12.9	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/23/97
Checked By

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-12

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	NR	-0.06	56	48.2	38.5	0.0	13.3	20%	113	5.5	2.7	20%	NC	BLK
06/11/96	71	28.95 F	NR	-0.72	71	35.1	34.5	0.8	29.6	20%	290	14.2	5.0	0%	0	BLK
07/16/96	79	29.95 F	NR	-0.32	71	59.8	39.6	0.6	0.0	0%	0	0.0	0.0	30%	300	BLK
08/13/96	71	29.96 F	NR	-0.54	73	37.9	31.8	0.8	29.5	30%	300	14.7	5.6	0%	0	BLK
09/17/96	50	30.29 R	NR	-0.58	65	57.5	38.2	0.8	3.5	0	0	0.0	0.0	10%	200	BLK
10/15/96	50	29.91 S	NR	-0.06	67	49.4	35.3	0.2	15.1	10%	150	7.4	3.6	10%	NC	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-5.84	-0.09	59	48.2	34.7	0.0	17.1	15	7.2	NC	Accu-flow well head installed;	BLK
12/17/96	0	29.82 S	-5.72	-0.28	52	51.0	34.3	0.0	14.7	11	5.6	NC		BLK
01/21/97	33	29.68 F	-4.65	+0.12	50	57.7	39.2	0.0	3.1	11	6.3	20		BLK
02/19/97	17	30.21 R	-4.89	-1.23	55	38.4	33.6	0.0	28.0	33	12.7	20		BLK
03/18/97	32	30.54 R	-4.81	-1.25	55	30.3	29.4	0.0	40.3	38	11.5	10		BLK
04/22/97	43	29.91 S	-7.20	-1.30	55	43.6	33.4	0.1	22.9	10	4.4	6		BLK
05/21/97	60	30.36 F	-10.50	-0.23	53	45.8	35.2	0.1	18.9	6	2.7	NC		BLK
06/11/97	73	30.02 S	-8.20	-0.06	54	50.2	36.9	0.1	12.8	6	3.0	8		BLK
10/22/97	39	30.16 R	-1.94	-1.31	60	57.6	39.6	0.1	2.7	40	23.0	10		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/23/97
Checked By

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-14

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-4.04	+0.01	52	38.6	32.3	0.2	28.9	0	0	0.0	0.0	0	NC	BLK
06/11/96	71	28.95 F	-3.03	-0.14	71	34.5	33.3	0.0	32.2	0	0	0.0	0.0	0	NC	BLK
07/16/96	79	29.95 F	-1.82	0.0	74	46.3	42.8	0.9	10.0	0	0	0.0	0.0	0	NC	BLK
08/13/96	71	29.96 F	-4.57	-0.23	62	36.4	28.4	1.0	34.2	0	0	0.0	0.0	0	NC	BLK
09/17/96	50	30.29 R	-5.48	-0.05	61	40.9	30.1	0.1	28.9	0	0	0.0	0.0	0	NC	BLK
10/15/96	50	29.91 S	-2.79	-0.14	61	37.2	28.2	0.9	33.7	0	0	0.0	0.0	0	NC	BLK
11/12/96	16	30.72 R	-6.60	-0.08	44	25.2	19.4	6.7	48.7	0	0	0.0	0.0	0	NC	BLK
12/17/96	NO READING - FROZEN BUTTERFLY VALVE															BLK
01/21/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
02/19/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
03/18/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
04/22/97	43	29.91 S	-5.82	-0.09	54	32.6	28.4	2.3	36.7	0	0	0.0	0.0	0	NC	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
05/21/97	60	30.36 F	-12.20	-0.05	54	36.2	31.4	0.2	32.2	0	0.0	NC		BLK
06/11/97	73	30.02 S	-9.00	+0.21	54	58.5	39.1	0.1	2.3	0	0.0	2.0		BLK
10/22/97	39	30.16 R	-7.67	+0.33	50	58.6	38.7	0.1	2.6	2	1.2	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 5/8/97.
NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/23/97
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TABLE 4 (cont.)

WEEKLY CONDENSATE INVENTORY

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	DEPTH OF LEACHATE/ CONDENSATE (Inches)	VOLUME OF LEACHATE/ CONDENSATE IN TANK (Gallons)	ESTIMATED VOLUME PUMPED INTO TANK (Gallons)	VOLUME ACCUMULATED SINCE LAST MEASUREMENT (Gallons)	VOLUME REMOVED FROM TANK (Gallons)	AVERAGE LIQUID GENERATION RATE (Gallons/Day)
01/07/97	34.50	1588	NA	92	0	13.1
01/14/97	36.50	1711	NA	123	0	17.6
01/22/97	36.75	1726	NA	15	0	1.9
01/28/97	40.00	1893	NA	167	0	23.9
02/04/97	42.00	2051	NA	158	0	22.6
02/11/97	44.50	2206	NA	155	0	22.1
02/19/97	47.00	2361	NA	155	0	19.4
02/26/97	49.00	2484	NA	121	0	17.3
03/04/97	53.00	2727	NA	243	0	40.5 (3)
03/11/97	57.00	2963	NA	236	0	33.7 (3)
03/11/97	23.50	939	NA	NA	2024	NA
03/18/97	25.00	1024	NA	85	0	12.1
03/25/97	27.50	1168	NA	144	0	20.6
04/01/97	29.50	1286	NA	118	0	16.9
04/08/97	31.50	1405	NA	119	0	17.0
04/15/97	33.00	1496	NA	91	0	13.0
04/22/97	35.00	1618	NA	122	0	17.4
04/29/97	36.00	1680	NA	62	0	8.9
05/08/97	38.00	1803	NA	123	0	13.7
05/13/97	39.00	1865	NA	62	0	12.4
05/20/97	40.25	1943	NA	78	0	11.1
05/27/97	41.50	2021	NA	78	0	11.1
06/04/97	43.25	2128	NA	107	0	13.4
06/12/97	44.00	2175	NA	47	0	6.7
06/17/97	44.00	2175	NA	0	0	0.0
06/24/97	46.00	2299	NA	124	0	17.7
Gas Extraction System Shut Down 6/24/97						
10/07/97	47.00	2361	NA	62	0	NA
10/20/97	47.50	2392	NA	31	2392	NA
10/22/97	63.50	3327	3327	3327	3327	1663.5

NOTE:
(1) NA = NOT AVAILABLE OR NOT APPLICABLE
(2) AVERAGE LIQUID GENERATION RATE = VOLUME ACCUMULATED SINCE LAST MEASURE/DAYS SINCE PREVIOUS MEASURE
(3) HIGH VOLUME OF LIQUID DUE TO LEAK IN PLUG FITTING ON TANK LOADOUT SLAB

Prepared By ESZ 10/27/97
Checked By

g:junker\ommoct

TABLE 7

SUMMARY OF GAS EXTRACTION WELL ADJUSTMENTS

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	GAS WELL	INITIAL VALVE SETTING	INITIAL VELOCITY (FPM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	REASON FOR CHANGE
04/24/96	GEW-7	0	0	1	690	High methane, low oxygen
05/01/96	GEW-7	1	790	0	0	Low methane
05/06/96	GEW-4	0	0	1	474	Low oxygen, moderate methane
	GEW-5	1	540	0	0	Low methane, high oxygen and balance gas
	GEW-11	2	737	1	366	High oxygen
	GEW-13	1	190	2	1120	High methane
05/15/96	GEW-13	2	950	0	0	Low methane, high balance gas
05/30/96	GEW-4	1	452	0	0	Low methane, high oxygen, and balance gas
	GEW-8	2	840	1	430	High oxygen
	GEW-9	2	380	1	280	High oxygen, low balance gas
06/12/96	GEW-3	0	0	1	910	High methane, low oxygen and balance gas
	GEW-4	0	0	1	980	High methane, low oxygen and balance gas
	GEW-5	0	0	1	0	High methane, low oxygen and balance gas
	GEW-7	0	0	1	0	High methane, low oxygen and balance gas
	GEW-12	20%	290	0	0	Low methane, high balance gas
06/19/96	GEW-3	1	NA	0	0	Low methane, high balance gas
	GEW-4	1	NA	0	0	Low methane, high balance gas
	GEW-7	1	NA	0	0	Low methane, high oxygen and balance gas
	GEW-8	1	NA	0	0	Low methane, high oxygen and balance gas
06/25/96	GEW-8	0	0	1	880	High methane, low balance gas
07/16/96	GEW-5	1	600	0	0	Low methane, high balance gas
	GEW-6	1	550	0	0	Low methane, high balance gas
	GEW-7	0	0	1	360	High methane, low balance gas
	GEW-8	1	1010	0	0	Low methane, high oxygen, and balance gas
	GEW-10	3	760	1	295	Low methane, high oxygen, and balance gas
	GEW-12	0	0	0	300	High methane, low balance gas
	GEW-13	0	0	1	540	High methane, low balance gas
07/24/96	GEW-8	0	0	1	350	High methane, low balance gas

NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

g:junker\ommoct

TABLE 7 (cont.)

SUMMARY OF GAS EXTRACTION WELL ADJUSTMENTS

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	GAS WELL	INITIAL FLOW (CFM)	ADJUSTED FLOW (CFM)	REASON FOR CHANGE
12/17/96	GEW-2	10	3	Low methane
	GEW-3	0	5	High methane
	GEW-4	11	5	Low methane
	GEW-5	2-11	12	High methane; drained water in lateral
	GEW-8	23	30	High methane
	GEW-9	2	10	High methane
	GEW-10	22	30	High methane
	GEW-11	21	30	High methane
	GEW-13	0	6	High methane
01/21/97	GEW-2	3	2	Low methane
	GEW-3	5	0	Frozen lateral piping
	GEW-4	1	7	High methane, low oxygen and balance gas
	GEW-5	12	0	Frozen lateral piping
	GEW-7	25	35	High methane, low oxygen and balance gas
	GEW-9	2	5	High methane, low oxygen and balance gas
	GEW-11	26	30	High methane, low oxygen and balance gas
	GEW-12	11	20	High methane, low oxygen and balance gas
02/19/97	GEW-2	5	0	Low methane
	GEW-3	0	5	Lateral thawed
	GEW-4	7	0	Low methane
	GEW-7	34	20	Adjust to determine target flow rate
	GEW-10	27	30	Adjust to determine target flow rate

NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

TABLE 7 (cont.)

SUMMARY OF GAS EXTRACTION WELL ADJUSTMENTS

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	GAS WELL	INITIAL FLOW (CFM)	ADJUSTED FLOW (CFM)	REASON FOR CHANGE
05/20/97	GEW-3	2	0	Low methane
	GEW-4	2	0	Low methane
05/21/97	GEW-6	7	5	Adjust to determine target flow rate
	GEW-7	8	5	Adjust to determine target flow rate
06/11/97	GEW-3	0	2	High methane
	GEW-4	0	2	High methane
	GEW-12	6	8	Adjust to determine target flow rate
	GEW-13	0	2	High methane
	GEW-14	0	2	High methane
10/22/97	GEW-12	40	10	Adjust to target flow rate

NA = Not Available or Not Applicable NC = No Change from Initial setting NR = No Reading

Prepared By ESZ 10/27/97

Checked By

g:junker\ommoct

PROJECT NAME Junker Landfill DATE 10/7/97 BY Brian Kent

CONVERSATIONS

WHO/REPRESENTING Dave Trainor (Dames & Moore): I called Dave to determine if the entrance gate was open for a particular reason.

ACTION ITEMS Dave said that the gate should have been locked and didn't need to be unlocked for access for any of the contractors providing services at the landfill. The gate is chained and locked when I leave the site.

WHO/REPRESENTING

ACTION ITEMS

WHO/REPRESENTING

ACTION ITEMS

WHO/REPRESENTING

ACTION ITEMS

WHO/REPRESENTING

ACTION ITEMS

WHO/REPRESENTING

ACTION ITEMS

TABLE 1 (cont.)

SYSTEM MONITORING

SEH INC.

JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	HEADER LINE VACUUM (In. H20)	BLOWER INLET VACUUM (In. H20)	BLOWER DISCHARGE PRESSURE (In.. H20)	GAS TO FLARE						VELOCITY (ft./min)	TOTAL GAS FLOW (cubic feet/min)	COMMENTS	BY:
						PRESSURE (In. H20)	TEMP. (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %				
09/17/96	50	30.29 R	-5.70	-30.5	+0.62	-0.07	96	43.9	33.9	0.2	22.1	1020	200		BLK
09/24/96	50	30.14 S	-6.93	-30.0	+0.56	-0.07	96	50.1	36.4	0.2	13.3	1020	200		BLK
10/02/96	48	30.39 R	-6.93	-30.0	+0.58	-0.07	100	44.2	33.9	0.2	21.7	969	190		BLK
10/08/96	45	30.04 S	-6.38	-29.5	+0.59	-0.07	96	47.2	36.0	0.2	16.6	1020	200		BLK
10/15/96	50	29.91 S	-6.95	-29.5	+0.60	-0.07	96	46.4	34.6	0.2	18.8	995	195		BLK
10/29/96	46	29.54 F	-8.42	-29.5	+0.42	-0.07	84	52.2	39.5	0.0	8.3	918	180		BLK
11/05/96	43	30.03 S	-7.00	-30.5	+0.49	-0.07	89	44.6	34.9	0.1	20.4	918	180		BLK
11/12/96	16	30.72 R	-8.53	-31.5	+0.60	-0.07	79	44.4	35.0	0.1	20.5	1046	205		BLK
11/20/96	25	30.08 R	-9.77	-30.5	+0.60	-0.07	73	47.6	36.2	0.1	16.1	995	195		BLK
11/26/96	1	30.58 R	-10.40	-31.0	+0.56	-0.07	67	45.7	34.0	0.1	17.2	969	190		BLK
12/03/96	17	30.16 R	-9.66	-30.5	+0.56	-0.07	78	46.3	35.3	0.1	18.3	995	195		BLK
12/10/96	26	29.74 R	-9.50	-30.0	+0.57	-0.07	76	46.6	36.1	0.2	17.1	995	195		CAU
12/17/96	0	29.82 S	-9.80	-30.5	+0.61	-0.07	66	47.0	36.0	0.1	16.9	995	195		BLK
12/24/96	-5	30.26 R	-9.70	-31.5	+0.48	-0.07	65	48.5	37.4	0.0	14.1	893	175	Header line freezing	BLK
12/31/96	18	30.32 R	-0.04	-26.0	+0.10	-0.04	65	57.0	37.8	0.5	4.7	77	15	Header line freezing/insulated	BLK
01/03/97	NA	NA	-9.70	-28.0	+0.63	-0.07	61	58.5	38.8	0.0	2.7	1097	215		BLK
01/07/97	-3	30.36 R	-9.60	-41.5	+0.66	-0.07	67	51.1	36.3	0.1	12.5	1097	215		BLK
01/14/97	-4	30.44 F	-9.50	-37.5	+0.62	-0.07	67	47.9	36.7	0.1	15.3	1071	210		BLK
01/21/97	33	29.68 F	-10.50	-30.0	+0.56	-0.08	60	55.7	39.2	0.1	5.0	1071	210		CU/BLK
01/28/97	-6	30.53 R	-10.10	-30.0	+0.66	-0.08	67	45.0	34.0	0.1	20.9	1046	205		BLK
02/04/97	21	30.06 S	-9.40	-29.5	+0.67	-0.08	75	46.6	35.1	0.1	18.2	1046	205		BLK
02/11/97	8	30.16 S	-9.70	-30.0	+0.70	-0.07	73	43.7	36.1	0.1	20.1	1020	200		BLK
02/19/97	17	30.21 R	-9.80	-30.5	+0.66	-0.07	74	40.6	34.4	0.1	24.9	1020	200		CU/BLK
02/26/97	31	29.76 R	-9.50	-30.5	+0.65	-0.07	83	43.0	34.3	0.1	22.6	1020	200		BLK
03/04/97	32	29.95 R	-10.40	-30.5	+0.65	-0.07	78	40.7	33.4	0.1	25.8	1020	200		BLK
03/11/97	32	30.28 R	-10.60	-30.5	+0.66	-0.07	83	40.1	32.4	0.1	NR	1020	200		BLK
03/11/97	32	30.28 R	-8.00	-30.5	+0.50	-0.07	83	NR	NR	NR	NR	893	175	Decreased header line vacuum	BLK
03/18/97	32	30.54 R	-8.85	-31.0	+0.50	-0.07	79	38.3	32.7	0.2	28.8	893	175		BLK

TABLE 2

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-1

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-6.77	-0.01	54	10.6	24.0	1.7	63.7	0	0	0.0	0.0	0	NC	BLK
06/11/96	71	28.95 F	-5.66	-0.01	70	17.9	30.0	0.0	52.1	0	0	0.0	0.0	0	NC	BLK
07/16/96	79	29.95 F	-7.49	-0.20	74	13.5	23.3	1.3	61.9	0	0	0.0	0.0	0	NC	BLK
08/13/96	71	29.96 F	-4.53	-0.42	67	44.3	32.7	1.7	21.3	0	0	0.0	0.0	0	NC	BLK
09/17/96	50	30.29 R	-4.98	-0.16	59	24.8	26.7	0.8	47.7	0	0	0.0	0.0	0	NC	BLK
10/15/96	50	29.91 S	-4.83	-0.17	65	23.7	25.9	0.3	50.1	0	0	0.0	0.0	0	NC	BLK
11/12/96	16	30.72 R	-6.50	-0.10	61	10.5	23.2	2.0	64.3	0	0	0.0	0.0	0	NC	BLK
12/17/96	NO READING - FROZEN BUTTERFLY VALVE															BLK
01/21/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
02/19/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
03/18/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
04/22/97	43	29.91 S	-7.70	-0.02	67	9.5	20.6	2.9	67	0	0	0.0	0.0	0	NC	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
05/20/97	52	30.20 S	-12.20	-0.17	58	9.2	23.1	0.1	67.6	0	0.0	NC		BLK
06/11/97	73	30.02 S	-12.10	+0.19	61	28.7	28.9	0.0	42.4	0	0.0	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 5/8/97.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By BLK 10/14/97

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-3

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-5.10	-0.85	53	27.6	25.2	0.8	46.4	0	0	0.0	0.0	0	NC	BLK
06/11/96	71	28.95 F	-4.40	-1.26	69	55.2	34.2	0.0	10.6	0	0	0.0	0.0	1	910	BLK
06/19/96	63	28.89 R	-6.30	-1.64	NA	33.8	26.1	0.50	39.6	1	NA	NA	NA	0	0	BLK
07/16/96	79	29.95 F	-7.16	-2.00	66	37.4	26.9	0.70	35.0	0	0	0.0	0.0	0	NC	BLK
08/13/96	71	29.96 F	-6.02	-0.80	67	56.3	29.5	0.30	13.9	0	0	0.0	0.0	1	550	BLK
09/17/96	50	30.29 R	-3.80	-2.63	62	29.7	25.2	0.20	44.9	1	840	41.2	12.2	0	0	BLK
10/15/96	Broken butterfly valve/temporarily capped off															

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-7.82	-0.07	44	35.1	23.6	0.0	41.3	0	0.0	NC	Accu-flow well head Installed	BLK
12/17/96	0	29.82 S	-9.27	-0.35	50	56.0	34.2	0.0	9.8	0	0.0	5		BLK
01/21/97	NO READING - FROZEN LATERAL PIPING													BLK
02/19/97	17	30.21 R	-8.40	-0.71	38	43.1	28.6	0.0	28.3	0	0.0	5		BLK
03/18/97	32	30.54 R	1.10	-4.40	35	32.0	25.8	0.0	42.2	2	0.1	0		BLK
04/22/97	43	29.91 S	-9.70	-0.28	40	52.0	32.3	0.0	15.7	0	0.0	2		BLK
05/20/97	52	30.20 S	-8.20	-0.56	45	29.7	25.0	0.1	45.2	2	0.1	0	Surging	BLK
06/11/97	73	30.02 S	-10.30	-0.15	57	53.7	33.4	0.1	12.8	0	0.0	2		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By [signature] 10/17

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-5

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-5.43	-4.43	53	38.0	30.5	2.4	29.1	1	540	26.5	10.1	0	0	BLK
06/11/96	71	28.95 F	-2.38	-0.38	64	65.4	34.6	0.0	0.0	0	0	0.0	0.0	1	1090	BLK
07/16/96	79	29.95 F	-10.45	-0.59	67	42.6	32.6	0.3	24.5	1	600	29.5	12.5	0	0	BLK
08/13/96	71	29.96 F	-4.90	+0.20	67	61.3	38.2	0.1	0.4	0	0	0.0	0.0	1	370	BLK
09/17/96	50	30.29 R	-3.86	-0.77	57	44.9	33.6	0.0	21.5	1	690	33.9	15.2	1	NC	BLK
10/15/96	50	29.91 S	-4.30	-0.70	60	41.0	31.3	0.3	27.4	1	660	32.4	13.3	1 - 0.5	185	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-2.64	-0.36	55	43.7	31.2	0.0	25.1	7-20	3.1-8.7	NC	Surging/Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-5.30	-0.13	50	55.1	36.0	0.0	8.9	2-11	1.1-6.1	12	Water Surging/drained water	BLK
01/21/97	NO READING - FROZEN LATERAL PIPING													BLK
02/19/97	NO READING - FROZEN LATERAL PIPING													BLK
03/18/97	NO READING - FROZEN LATERAL PIPING													BLK
04/22/97	43	29.91 S	-7.70	-0.04	50	52.0	35.7	0.0	12.3	0	0.0	5	Surging	BLK
05/20/97	52	30.20 S	-7.20	-0.32	48	45.0	33.5	0.2	21.3	2	0.9	NC	Surging	BLK
06/11/97	73	30.02 S	-9.60	+0.06	45	48.7	34.7	0.1	16.5	2	1.0	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.

NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By [illegible] 10/17

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-7

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
04/24/96	51	29.72 F	-9.00	+0.25	NR	36.0	NR	0.1	NR	0	0	0.0	0.0	1	690	BLK
05/01/96	68	29.81 S	-6.50	-0.40	66	22.0	NR	0.3	NR	1	790	38.8	8.5	0	0	BLK
05/06/96	46	30.35 F	-4.85	-0.07	61	53.8	40.4	1.6	4.2	0	0	0.0	0.0	0	NC	BLK
05/30/96	70	30.21 S	-5.47	0.00	74	60.5	38.8	1.7	0.0	0	0	0.0	0.0	0	NC	BLK
06/11/96	71	28.95 F	-2.54	-0.06	78	63.1	36.9	0.0	0.0	0	0	0.0	0.0	1	980	BLK
06/19/96	63	29.89 R	-6.90	-0.20	NA	13.8	16.2	9.9	60.1	1	NA	NA	NA	0	0	BLK
07/16/96	79	29.95 F	-7.26	-0.43	85	51.0	38.0	1.8	9.2	0	0	0.0	0.0	1	360	BLK
08/13/96	71	29.96 F	-4.45	+0.12	82	58.2	41.0	0.2	0.6	1	440	21.6	12.6	1	NC	BLK
09/17/96	50	30.29 R	-6.18	-0.32	65	46.2	36.4	0.5	16.9	1	575	28.2	13.0	1	NC	BLK
10/15/96	50	29.91 S	-7.41	+0.02	74	48.8	38.2	0.1	12.9	1	890	43.7	21.3	1	NC	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-7.01	-0.35	70	44.8	36.2	0.0	19.0	31	13.9	25	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-6.46	-0.20	68	50.3	35.1	0.0	14.6	24	12.1	NC		BLK
01/21/97	33	29.68 F	-7.80	+0.22	68	51.2	37.1	0.0	11.7	25	12.8	35		BLK
02/19/97	17	30.21 R	-9.20	-0.62	65	37.0	33.4	0.0	29.6	34	12.6	20		BLK
03/18/97	32	30.54 R	-8.00	-0.35	70	36.3	32.5	0.0	31.2	35	12.7	15	Surging	BLK
04/22/97	43	29.91 S	-8.04	-0.20	60	35.5	32.1	0.0	32.4	15	5.3	5	Surging	BLK
05/21/97	60	30.36 F	-11.20	-0.35	60	35.6	32.0	0.1	32.3	8	2.8	5		BLK
06/11/97	73	30.02 S	-8.80	+0.07	68	42.1	32.9	0.2	24.8	5	2.1	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By [illegible] 10/15/97

g:junker\ommoct

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-9

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
04/24/96	51	29.72 F	-4.00	-3.50	63	35.0	NR	0.8	NR	2	360	17.7	6.2	2	NC	BLK
05/06/96	46	30.35 F	-4.61	-4.17	61	54.7	39.1	0.7	5.5	2	340	16.7	9.1	2	NC	BLK
05/30/96	70	30.21 S	-4.25	-3.88	77	63.4	35.4	1.2	0.0	2	380	18.7	11.8	1	280	BLK
06/11/96	71	28.95 F	-3.96	-2.97	87	59.1	39.9	1.0	0.0	1	410	20.1	11.9	1	NC	BLK
07/16/96	79	29.95 F	-11.70	-5.11	86	50.7	33.6	3.3	12.4	1	650	31.9	16.2	1	350	BLK
08/13/96	71	29.96 F	-2.94	-0.43	89	59.3	38.9	0.8	1.0	1	380	18.7	11.1	1	NC	BLK
09/17/96	50	30.29 R	-6.48	-4.72	68	59.5	38.2	0.2	2.1	1	500	24.6	14.6	2	545	BLK
10/15/96	50	29.91 S	-5.14	-4.84	78	55.3	36.2	1.2	7.3	2	460	22.6	12.5	1	350	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-6.76	-4.80	63	56.0	36.6	0.2	7.2	31	17.4	25	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-5.56	-4.89	60	61.0	36.4	0.0	2.6	2	1.2	10	Max. flow for pressure	BLK
01/21/97	33	29.68 F	-5.24	-3.26	60	57.2	37.1	0.4	5.3	2	1.1	5	Max. flow for pressure	BLK
02/19/97	17	30.21 R	-5.65	-5.42	60	56.7	37.8	0.3	5.2	5	2.8	NC	Max. flow for pressure	BLK
03/18/97	32	30.54 R	-5.25	-5.19	58	56.6	37.1	0.3	6.0	5	2.8	NC	Max. flow for pressure	BLK
04/22/97	43	29.91 S	-6.90	-6.80	65	55.0	37.2	0.3	7.5	9	5.0	NC	Max. flow for pressure	BLK
05/21/97	60	30.36 F	-10.40	-10.30	65	54.8	37.3	0.3	7.6	10	5.5	NC	Max. flow for pressure	BLK
06/11/97	73	30.02 S	-8.20	-8.00	68	54.8	38.4	0.3	6.5	7	3.8	NC	Max. flow for pressure	BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from Initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By BWL 10/17/97

g:junker\ommoct

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-11

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-3.92	-1.74	73	45.2	34.9	0.9	19.0	2	737	36.2	16.4	1	366	BLK
06/11/96	71	28.95 F	-3.34	-0.92	91	52.3	40.9	1.6	5.2	1	600	29.5	15.4	1	NC	BLK
07/24/96	66	29.90 R	-4.32	-0.90	77	48.1	33.6	1.4	16.9	1	400	19.6	9.4	1	NC	BLK
08/13/96	71	29.96 F	-2.10	-0.39	86	56.3	38.3	0.4	5.0	1	450	22.1	12.4	1	NC	BLK
09/17/96	50	30.29 R	-4.09	-0.95	75	54.6	36.2	0.4	8.8	1	525	25.8	14.1	1	NC	BLK
10/15/96	50	29.91 S	-5.64	-1.48	79	46.6	32.5	2.1	18.8	1	640	31.4	14.6	1 - 0.5	430	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-5.66	-1.70	70	55.6	36.5	0.0	7.9	18	10.0	22	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-4.86	-1.45	68	57.7	35.6	0.0	6.7	21	12.1	30		BLK
01/21/97	33	29.68 F	-4.10	-2.15	68	55.0	36.9	0.0	8.1	26	14.3	30		BLK
02/19/97	17	30.21 R	-4.25	-2.20	70	47.2	35.0	0.0	17.8	25	11.8	27		BLK
03/18/97	32	30.54 R	-4.10	-3.49	68	44.8	33.4	0.0	21.8	27	12.1	20		BLK
04/22/97	43	29.91 S	-8.04	-2.01	70	44.5	33.8	0.0	21.7	20	8.9	NC		BLK
05/21/97	60	30.36 F	-9.80	-2.40	70	45.7	34.3	0.1	19.9	20	9.1	NC		BLK
06/11/97	73	30.02 S	-7.60	-1.81	70	44.3	33.6	0.1	22.0	20	8.9	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By [signature] 10/17

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-13

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-6.89	+0.20	58	40.4	30.2	2.9	26.5	1	190	9.3	3.8	2	NC	BLK
05/06/96	46	30.35 F	-3.71	-0.93	59	46.4	34.6	0.2	18.8	2	1120	55.0	25.5	2	NC	BLK
05/07/96	58	30.17 F	-3.62	-1.15	NR	47.1	35.4	0.3	17.2	2	NR	NR	NR	2	NC	BLK
05/15/96	55	29.85 F	-3.74	-1.33	61	30.8	31.3	0.2	37.7	2	950	46.6	14.4	0	0	BLK
06/11/96	71	28.95 F	-3.62	-0.36	76	31.4	31.0	0.0	37.6	0	0	0.0	0.0	0	NC	BLK
07/16/96	79	29.95 F	-3.44	-0.29	87	56.7	32.1	1.5	9.7	0	0	0.0	0.0	1	540	BLK
08/13/96	71	29.96 F	-6.07	-0.08	79	34.0	30.8	0.4	34.8	1	540	26.5	9.0	0	0	BLK
09/17/96	50	30.29 R	-3.93	-0.67	69	56.9	34.9	0.2	8.0	0	0	0.0	0.0	1	350	BLK
10/15/96	50	29.91 S	-5.10	-0.81	69	32.5	28.1	1.1	38.3	1	750	36.8	12.0	0	0	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/12/96	16	30.72 R	-7.22	-0.18	55	34.1	27.4	0.0	38.5	0	0	NC	Accu-flow well head installed	BLK
12/17/96	0	29.82 S	-7.70	-0.34	50	54.3	31.5	0.0	14.2	0	0	6		BLK
01/21/97	33	29.68 F	-7.37	+0.06	50	52.9	35.8	0.0	11.3	14	7.4	NC		BLK
02/19/97	17	30.21 R	-7.90	-0.42	50	26.5	28.4	0.0	45.1	10	2.7	3		BLK
03/18/97	32	30.54 R	-9.96	-0.58	55	20.7	25.1	0.4	53.8	8	1.7	0		BLK
04/22/97	43	29.91 S	-9.12	-0.32	50	40.0	29.5	0.1	30.4	0	0.0	NC		BLK
05/21/97	60	30.36 F	-11.80	-0.15	50	34.7	29.9	0.2	35.2	0	0.0	NC		BLK
06/11/97	73	30.02 S	-9.60	+0.04	58	54.4	33.6	0.1	11.9	0	0.0	2		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By [signature] 10/17

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TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-15

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-3.69	-2.39	51	25.5	25.8	0.7	48.0	0	0	0.0	0.0	0	NC	BLK
06/11/96	71	28.95 F	-3.72	-2.88	69	28.6	29.2	0.0	42.2	0	0	0.0	0.0	0	NC	BLK
07/16/96	79	29.95 F	-2.99	-0.06	89	26.6	24.7	1.8	46.9	0	0	0.0	0.0	0	NC	BLK
08/13/96	71	29.96 F	-5.95	-3.01	81	35.6	27.6	1.9	34.9	0	0	0.0	0.0	0	NC	BLK
09/17/96	50	30.29 R	-4.62	-3.96	66	40.4	30.0	0.2	29.4	0	0	0.0	0.0	0	NC	BLK
10/15/96	50	29.91 S	-4.40	-3.59	66	40.1	29.7	0.5	29.7	0	0	0.0	0.0	0	NC	BLK
11/12/96	16	30.72 R	-6.75	-4.5	42	24.9	20.0	7.5	47.6	0	0	0.0	0.0	0	NC	BLK
12/17/96	NO READING - FROZEN BUTTERFLY VALVE															BLK
01/21/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
02/19/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
03/18/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
04/22/97	43	29.91 S	-8.19	-5.77	53	13.0	19.3	3.6	64.1	0	0	0.0	0.0	0	NC	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
05/21/97	60	30.36 F	-12.20	-0.10	52	8.2	17.2	2.0	72.6	0	0.0	NC		BLK
06/11/97	73	30.02 S	-9.10	+0.17	60	17.8	24.2	0.1	57.9	0	0.0	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 5/8/97.
NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By DK 10/17

g:junker\ommoct

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-17

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H2O)	WELL HEAD PRESSURE (In. H2O)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
05/06/96	46	30.35 F	-5.5	-0.24	47	16.4	20.5	5.2	57.9	0	0	0.0	0.0	0	NC	BLK
06/11/96	71	28.95 F	-4.4	-0.07	87	25.1	27.2	3.6	44.1	0	0	0.0	0.0	0	NC	BLK
07/16/96	79	29.95 F	-2.85	0.00	81	28.6	29.1	0.4	41.9	0	0	0.0	0.0	0	NC	BLK
08/13/96	71	29.96 F	-6.10	NR	73	36.1	26.5	5.8	31.6	0	0	0.0	0.0	0	NC	BLK
09/17/96	50	30.29 R	-4.52	-0.26	58	36.6	29.2	1.4	32.8	0	0	0.0	0.0	0	NC	BLK
10/15/96	50	29.91 S	-3.10	-0.29	55	37.2	31.4	0.4	31.0	0	0	0.0	0.0	0	NC	BLK
11/12/96	16	30.72 R	-7.11	-0.15	44	15.5	11.6	11.8	61.1	0	0	0.0	0.0	0	NC	BLK
12/17/96	NO READING - FROZEN BUTTERFLY VALVE															BLK
01/21/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
02/19/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
03/18/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
04/22/97	43	29.91 S	-9.30	-0.02	60	11.0	17.9	7.9	63.2	0	0	0.0	0.0	0	NC	BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In. H20)	WELL HEAD PRESSURE (In. H20)	GAS TEMP (F)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
05/21/97	60	30.36 F	-11.40	-0.08	55	18.0	27.5	0.3	54.2	0	0.0	NC		BLK
06/11/97	73	30.02 S	-9.91	+0.15	64	20.4	25.5	0.1	54.0	0	0.0	NC		BLK

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 5/8/97.
NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97
Checked By [signature] 10/17

g:junker\ommoct

TABLE 3

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-1A

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
05/07/96	58	30.17 F	+0.15	0.0	6.7	14.3	79.0		BLK
06/12/96	78	28.97 F	-0.07	0.0	0.3	22.0	77.7		BLK
07/17/96	74	29.89 F	+0.06	0.0	6.0	15.4	78.6		BLK
08/14/96	71	29.98 R	-0.02	0.0	0.4	20.9	78.7		CAU
09/18/96	55	30.36 R	+0.07	0.0	0.2	21.0	78.8		BLK
10/16/96	54	29.79 S	0.00	0.0	5.4	NA	NA	GEM-500 Malfunction	BLK
11/12/96	16	30.72 R	+0.03	0.0	1.7	19.6	78.7		BLK
12/18/96	7	29.83 R	-0.06	0.0	0.0	20.6	79.4		BLK
01/22/97	18	29.61 R	-0.26	0.0	0.2	20.2	79.6		BLK
02/20/97	37	29.76 F	+0.14	0.0	7.2	13.9	78.9		BLK
03/19/97	33	30.16 F	+0.44	0.0	6.8	14.1	79.1		BLK
04/23/97	45	29.98 F	+0.07	0.0	5.6	16.3	78.1		BLK
05/21/97	60	30.36 F	+0.11	0.0	5.9	15.9	78.2		BLK
06/12/97	76	29.75 F	+0.11	0.0	6.6	14.6	78.8		BLK
07/07/97	63	30.13 R	+0.08	0.0	5.1	16.3	78.6		BLK
08/05/97	66	30.32 R	+0.09	0.0	6.4	14.5	79.1		BLK
09/17/97	67	29.90 R	-0.16	0.0	0.2	20.7	79.1		BLK
10/07/97	64	29.95 F	+0.07	0.0	5.6	17.0	77.4		BLK

NA = Not Available or Not Applicable NR= No Reading

Prepared By ESZ 10/16/97

Checked By BJH 10/17

g:junker\ommoct

TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-2A

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
04/24/96	51	29.72 F	+0.25	10.0	NA	0.1	NA		BLK
05/07/96	58	30.17 F	+0.01	19.8	30.9	0.0	49.3		BLK
06/12/96	78	28.97 F	-0.05	27.4	26.7	0.4	45.5		BLK
07/17/96	74	29.89 F	+0.09	22.5	25.8	0.0	51.7		BLK
08/14/96	71	29.98 R	-0.01	68.3	30.0	1.3	0.4		CAU
09/18/96	55	30.36 R	+0.01	46.8	37.0	0.1	16.1		BLK
10/16/96	54	29.79 S	+0.01	46.7	38.4	NA	NA	GEM-500 Malfunction	BLK
11/12/96	16	30.72 R	+0.04	43.6	34.6	0.0	21.8		BLK
12/18/96	7	29.83 R	-0.07	38.3	33.1	0.5	28.1		BLK
01/22/97	18	29.61 R	-0.27	41.5	34.5	0.0	24.0		BLK
02/20/97	37	29.76 F	+0.09	33.1	33.0	0.0	33.9		BLK
03/19/97	33	30.16 F	+0.36	28.4	30.4	0.0	41.2		BLK
04/23/97	45	29.98 F	+0.01	21.1	28.4	0.0	50.5		BLK
05/21/97	60	30.36 F	+0.36	16.0	24.4	2.4	57.2		BLK
06/12/97	76	29.75 F	+0.07	15.0	26.1	0.6	58.3		BLK
07/07/97	63	30.13 R	+0.11	43.0	29.0	0.1	27.9		BLK
08/05/97	66	30.32 R	+0.10	47.9	36.3	0.8	15.8		BLK
09/17/97	67	29.90 R	0.00	52.2	38.8	1.0	8.0		BLK
10/07/97	64	29.95 F	+0.11	57.0	40.8	0.1	2.1		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/16/97

Checked By DJC 10/17

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-3

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
05/07/96	58	30.17 F	+0.01	0.0	4.8	16.3	78.9		BLK
06/12/96	78	28.97 F	-0.06	0.0	4.9	17.3	77.8		BLK
07/16/96	74	29.89 F	0.00	0.0	6.5	15.2	78.3		BLK
08/14/96	71	29.98 R	0.00	0.0	5.0	16.4	78.6		CAU
09/18/96	55	30.36 R	0.00	0.0	5.6	15.9	78.5		BLK
10/16/96	54	29.79 S	-0.01	0.0	7.1	NA	NA	GEM-500 Malfunction	BLK
11/12/96	16	30.72 R	+0.02	0.0	6.8	14.4	78.8		BLK
12/18/96	7	29.83 R	-0.06	0.0	0.0	21.3	78.7		BLK
01/22/97	18	29.61 R	-0.17	0.0	5.6	16.0	78.4		BLK
02/20/97	37	29.76 F	+0.10	0.0	5.1	16.7	78.2		BLK
03/19/97	33	30.16 F	+0.21	0.0	4.7	16.7	78.6		BLK
04/23/97	45	29.98 F	+0.03	0.0	4.5	17.1	78.4		BLK
05/21/97	60	30.36 F	+0.05	0.0	4.4	17.8	77.8		BLK
06/12/97	76	29.75 F	+0.03	0.0	3.5	17.8	78.7		BLK
07/07/97	63	30.13 R	+0.02	0.0	4.5	16.5	79.0		BLK
08/05/97	66	30.32 R	+0.07	0.0	4.9	16.4	78.7		BLK
09/17/97	67	29.90 R	-0.11	0.0	5.4	13.8	80.8		BLK
10/07/97	64	29.95 F	0.00	0.0	7.9	8.9	83.2		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97

Checked By BLK 10/15/97

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-4B

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
04/24/96	51	29.72 F	+0.30	0.0	NA	17.2	NA		BLK
05/07/96	58	30.17 F	+0.01	0.0	2.6	17.4	80.0		BLK
06/12/96	78	28.97 F	-0.00	0.0	1.0	21.0	78.0		BLK
07/17/96	74	29.89 F	+0.04	0.0	1.1	19.4	79.5		BLK
08/14/96	71	29.98 R	-0.10	0.0	0.9	19.7	79.4		CAU
09/18/96	55	30.36 R	+0.01	0.0	0.5	20.4	79.1		BLK
10/16/96	54	29.79 S	+0.02	0.0	1.1	NA	NA	GEM-500 Malfunction	BLK
11/12/96	16	30.72 R	+0.03	0.0	0.3	19.9	79.8		BLK
12/18/96	7	29.83 R	+0.01	0.0	0.9	18.4	80.7		BLK
01/22/97	18	29.61 R	-0.14	0.0	1.0	18.9	80.1		BLK
02/20/97	37	29.76 F	+0.06	0.0	1.2	19.5	79.3		BLK
03/19/97	33	30.16 F	+0.26	0.0	2.6	17.1	80.3		BLK
04/23/97	45	29.98 F	+0.02	0.0	0.0	21.2	78.8		BLK
05/21/97	60	30.36 F	+0.07	0.0	2.2	18.9	78.9		BLK
06/12/97	76	29.75 F	+0.07	0.0	2.2	18.2	79.6		BLK
07/07/97	63	30.13 R	+0.11	0.0	0.2	20.6	79.2		BLK
08/05/97	66	30.32 R	+0.03	0.0	0.0	20.9	79.1		BLK
09/17/97	67	29.90 R	-0.02	0.0	0.0	20.4	79.6		BLK
10/07/97	64	29.95 F	-0.02	0.0	0.2	20.4	79.4		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97

Checked By DUL 10/17

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.

JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-5M (Medium)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
12/18/96	7	29.83 R	+0.01	7.8	16.2	3.2	72.8		BLK
01/22/97	18	29.61 R	-0.32	1.8	11.2	5.9	81.1		BLK
02/20/97	37	29.76 F	+0.10	10.4	21.8	0.0	67.8		BLK
03/19/97	33	30.16 F	+0.46	8.5	20.6	0.0	70.9		BLK
04/23/97	45	29.98 F	+0.06	0.2	3.9	16.5	79.4		BLK
05/21/97	60	30.36 F	+0.04	1.9	12.3	6.6	79.2		BLK
06/12/97	76	29.75 F	+0.12	0.6	2.1	18.5	78.8		BLK
07/07/97	63	30.13 R	+0.11	0.5	3.6	15.0	80.9		BLK
08/05/97	66	30.32 R	+0.17	0.0	1.2	19.8	79.0		BLK
09/17/97	67	29.90 R	-0.01	0.5	4.5	15.1	79.9		BLK
10/07/97	64	29.95 F	+0.11	6.5	14.8	6.1	72.6		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97

Checked By dlk 10/17

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.

JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-6S (Shallow)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
12/18/96	7	29.83 R	+0.01	12.0	22.3	0.0	65.7		BLK
01/22/97	18	29.61 R	-0.07	12.5	9.8	12.8	64.9		BLK
02/20/97	37	29.76 F	0.00	16.0	23.0	0.0	61.0		BLK
03/19/97	33	30.16 F	+0.10	14.3	21.0	0.0	64.7		BLK
04/23/97	45	29.98 F	+0.03	3.0	16.3	2.7	78.0		BLK
05/21/97	60	30.36 F	+0.01	2.3	15.7	2.8	79.2		BLK
06/12/97	76	29.75 F	+0.02	2.8	17.3	1.4	78.5		BLK
07/07/97	63	30.13 R	+0.08	11.3	21.0	0.3	67.4		BLK
08/05/97	66	30.32 R	+0.02	24.8	23.9	0.1	51.2		BLK
09/17/97	67	29.90 R	+0.02	49.4	37.3	0.1	13.2		BLK
10/07/97	64	29.95 F	+0.07	46.7	35.1	0.2	18.0		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97

Checked By BLK 10/17

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-6D (Deep)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
12/18/96	7	29.83 R	+0.06	30.1	27.0	1.0	41.9		BLK
01/22/97	18	29.61 R	-0.28	28.5	23.2	2.5	45.8		BLK
02/20/97	37	29.76 F	+0.08	8.3	8.0	15.2	68.5		BLK
03/19/97	33	30.16 F	+0.48	24.6	28.7	0.0	46.7		BLK
04/23/97	45	29.98 F	+0.08	22.0	25.6	2.6	49.8		BLK
05/21/97	60	30.36 F	+0.10	17.7	21.7	6.5	54.1		BLK
06/12/97	76	29.75 F	+0.12	25.2	29.6	0.3	44.9		BLK
07/07/97	63	30.13 R	+0.21	11.8	19.7	4.3	64.2		BLK
08/05/97	66	30.32 R	+0.18	4.1	13.8	10.2	71.9		BLK
09/17/97	67	29.90 R	+0.06	37.2	33.2	0.6	29.0		BLK
10/07/97	64	29.95 F	+0.16	39.7	35.0	0.2	25.1		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/16/97
Checked By [signature] 11/97

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-8S (Shallow)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
12/18/96	7	29.83 R	+0.01	0.0	1.8	17.8	80.4		BLK
01/22/97	18	29.61 R	-0.04	0.2	1.2	19.2	79.4		BLK
02/20/97	37	29.76 F	-0.02	0.0	1.2	19.8	79.0		BLK
03/19/97	33	30.16 F	+0.04	0.0	0.7	20.4	78.9		BLK
04/23/97	45	29.98 F	+0.01	0.0	0.7	20.1	79.2		BLK
05/21/97	60	30.36 F	+0.02	0.0	0.2	21.0	78.8		BLK
06/12/97	76	29.75 F	+0.01	0.0	3.4	15.6	81.0		BLK
07/07/97	63	30.13 R	+0.02	16.1	17.2	3.2	63.5		BLK
08/05/97	66	30.32 R	+0.03	39.4	29.3	0.3	31.0		BLK
09/17/97	67	29.90 R	0.00	42.5	31.9	0.5	25.1		BLK
10/07/97	64	29.95 F	+0.02	43.2	33.6	0.5	22.7		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97
Checked By BLK 10/17

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-8D (Deep)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
12/18/96	7	29.83 R	+0.30	0.0	8.4	10.5	81.1		BLK
01/22/97	18	29.61 R	-0.30	0.1	6.2	11.2	82.5		BLK
02/20/97	37	29.76 F	+0.08	0.0	1.3	19.3	79.4		BLK
03/19/97	33	30.16 F	+0.40	0.0	10.0	8.4	81.6		BLK
04/23/97	45	29.98 F	+0.06	0.0	0.4	21.0	78.6		BLK
05/21/97	60	30.36 F	+0.14	0.0	0.2	21.0	78.8		BLK
06/12/97	76	29.75 F	+0.07	0.0	11.8	7.4	80.8		BLK
07/07/97	63	30.13 R	+0.08	5.0	6.1	14.5	74.4		BLK
08/05/97	66	30.32 R	+0.10	5.1	17.6	3.9	73.4		BLK
09/17/97	67	29.90 R	+0.01	21.7	24.4	3.4	50.5		BLK
10/07/97	64	29.95 F	+0.11	1.0	5.6	14.6	78.8		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97
Checked By BLK 10/97

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-10

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
12/18/96	7	29.83 R	-0.01	0.0	0.3	19.7	80.0		BLK
01/22/97	18	29.61 R	-0.67	0.0	0.0	20.1	79.9		BLK
02/20/97	37	29.76 F	+0.17	0.1	5.9	3.7	90.3		BLK
03/19/97	33	30.16 F	+0.89	0.1	5.9	3.1	90.9		BLK
04/23/97	45	29.98 F	+0.20	0.0	0.1	21.3	78.6		BLK
05/21/97	60	30.36 F	+0.35	0.1	5.4	6.2	88.3		BLK
06/12/97	76	29.75 F	+0.20	0.0	6.2	0.3	93.5		BLK
07/07/97	63	30.13 R	+0.27	0.0	6.0	1.8	92.2		BLK
08/05/97	66	30.32 R	+0.20	0.0	5.8	2.0	92.2		BLK
09/17/97	67	29.90 R	-0.10	0.0	0.9	18.4	80.7		BLK
10/07/97	64	29.95 F	+0.12	0.0	6.7	1.0	92.3		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97
Checked By [signature] 10/97

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: MW-7

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
05/07/96	58	30.17 F	+0.09	0.0	0.0	21.2	78.8		BLK
06/12/96	78	28.97 F	-0.03	0.0	0.0	21.6	78.4		BLK
07/17/96	74	29.89 F	-0.01	0.0	0.2	20.9	78.9		BLK
09/18/96	55	30.36 R	+0.16	0.1	0.2	21.0	78.8		BLK
10/16/96	54	29.95 S	+0.01	0.2	0.4	NA	NA	GEM-500 Malfunction	BLK
11/12/96	16	30.72 R	+0.10	7.3	17.4	0.4	74.9		BLK
12/18/96	7	29.83 R	-0.06	0.0	0.0	21.0	79.0		BLK
01/22/97	18	29.61 R	-0.32	0.3	0.8	19.6	79.3		BLK
02/20/97	37	29.76 F	+0.0	8.5	19.9	0.0	71.6		BLK
03/19/97	33	30.16 F	+0.43	6.7	19.3	0.0	74.0		BLK
04/23/97	45	29.98 F	+0.07	0.0	0.0	21.0	79.0		BLK
05/21/97	60	30.36 F	+0.12	0.0	0.0	21.0	79.0		BLK
06/12/97	76	29.75 F	+0.06	2.1	10.8	10.2	76.9		BLK
07/07/97	63	30.13 R	+0.14	0.0	0.0	21.0	79.0		BLK
08/05/97	66	30.32 R	+0.10	0.0	0.0	20.9	79.1		BLK
09/17/97	67	29.90 R	-0.11	0.0	0.0	20.7	79.3		BLK
10/07/97	64	29.95 F	+0.04	0.0	0.1	20.7	79.2		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97
Checked By [illegible] 10/15

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TABLE 3 (cont.)

GAS PROBE MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GP3-RES

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	COMMENTS	MONITORED BY:
04/24/96	51	29.72 F	+0.75	0.8	NA	2.7	NA		BLK
05/07/96	58	30.17 F	+0.07	0.3	8.9	7.2	83.6		BLK
06/12/96	78	28.97 F	-0.06	0.0	10.2	5.8	84.0		BLK
07/17/96	74	29.89 F	+0.06	0.4	9.6	5.8	84.2		BLK
08/14/96	71	29.98 R	-0.04	0.3	7.8	6.9	85.0		CAU
09/18/96	55	30.36 R	0.00	0.0	7.1	11.3	81.6		BLK
10/16/96	54	29.79 S	+0.02	0.4	9.6	NA	NA	GEM-500 Malfunction	BLK
11/12/96	16	30.72 R	+0.01	0.1	7.9	7.9	84.1		BLK
12/18/96			NO READING					Geoprobe tubing frozen	BLK
01/22/97			NO READING					Geoprobe tubing frozen	BLK
02/20/97			NO READING					Geoprobe tubing frozen	BLK
03/19/97			NO READING					Geoprobe tubing frozen	BLK
04/23/97	45	29.98 F	+0.06	0.0	7.8	8.2	84.0		BLK
05/21/97	60	30.36 F	+0.14	0.0	7.5	10.4	82.1		BLK
06/12/97	76	29.75 F	+0.16	0.3	11.8	1.1	86.8		BLK
07/07/97	63	30.13 R	+0.08	0.0	7.7	9.5	82.8		BLK
08/05/97	66	30.32 R	+0.07	0.0	6.9	9.4	83.7		BLK
09/17/97	67	29.90 R	-0.17	0.0	7.3	8.4	84.3		BLK
10/07/97	64	29.95 F	+0.01	0.0	7.9	8.0	84.1		BLK

NA = Not Available or Not Applicable NR = No Reading

Prepared By ESZ 10/14/97

Checked By [signature] 10/97

g:junker\ommoct

TABLE 4

WEEKLY CONDENSATE INVENTORY

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	DEPTH OF LEACHATE/ CONDENSATE (Inches)	VOLUME OF LEACHATE/ CONDENSATE IN TANK (Gallons)	ESTIMATED VOLUME PUMPED INTO TANK (Gallons)	VOLUME ACCUMULATED SINCE LAST MEASUREMENT (Gallons)	VOLUME REMOVED FROM TANK (Gallons)	AVERAGE LIQUID GENERATION RATE (Gallons/Day)
04/24/96	24.00	967	NA	NA	0	NA
05/01/96	26.00	1081	NA	114	0	16.3
05/07/96	29.75	1301	NA	220	0	36.7
05/15/96	32.50	1466	NA	165	0	20.6
05/20/96	33.50	1527	NA	61	0	12.2
05/30/96	35.75	1680	NA	153	0	15.3
06/04/96	37.00	1741	NA	61	0	12.2
06/11/96	38.00	1803	NA	62	0	8.9
06/19/96	39.50	1896	NA	93	0	11.6
06/25/96	41.50	2021	NA	125	0	20.8
07/01/96	42.50	2082	NA	61	0	10.2
07/09/96	43.00	2113	NA	31	0	3.9
07/16/96	45.50	2268	NA	155	0	22.1
07/24/96	47.00	2361	NA	93	0	11.6
07/30/96	47.00	2361	NA	0	0	0.0
08/06/96	47.50	2392	NA	31	0	4.4
08/13/96	48.50	2453	NA	61	0	8.7
08/20/96	48.50	2453	NA	0	0	0.0
08/27/96	50.00	2545	NA	92	0	13.1
09/03/96	50.50	2576	NA	31	0	5.2
09/09/96	50.50	2576	NA	0	0	0.0
09/17/96	50.50	2576	NA	0	0	0.0
09/24/96	51.00	2606	NA	30	0	4.3
10/02/96	51.00	2606	NA	0	0	0.0
10/08/96	52.50	2697	NA	91	0	15.2
10/15/96	54.00	2787	NA	90	0	12.9
10/29/96	58.50	3050	NA	263	3000	18.8
11/05/96	6.00	130	NA	80	0	10.0
11/12/96	9.50	256	NA	126	0	18.0
11/20/96	21.00	802	NA	676	0	84.5 (3)
11/26/96	22.50	884	NA	82	0	13.7
12/03/96	26.50	1110	NA	226	0	32.3
12/10/96	26.50	1110	NA	0	0	0.0
12/17/96	29.25	1271	NA	161	0	23.0
12/24/96	32.50	1466	NA	195	0	27.9
12/31/96	33.25	1496	NA	30	0	4.3

TABLE 5

LEACHATE HEAD MONITORING

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	LHW-1	LHW-2	LHW-3	LEW-1	GEW-1	GEW-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
05/07/96	3.76	1.19	0.00	NR	0.55	0.00	2.46	0.00	1.46	0.44	10.17	9.87	6.01	5.26	4.90(u)	0.83	0.70	0.00	0.17	0.25	0.25
06/11/96	4.68	1.34	0.00	NR	0.63	0.00	2.22	0.00	0.45	0.36	10.85	9.88	4.70	3.88	3.90(u)	0.00	0.65	0.00	0.27	0.24	0.25
07/16/96	5.16	1.31	0.04	NR	0.58	0.00	2.13	0.10	1.43	0.17	10.59	9.97	6.22	4.25	NR	0.66	0.76	0.11	0.20	0.21	0.19
08/13/96	5.20	1.32	0.04	NR	0.44	0.00	2.01	0.00	0.36	0.00	10.69	9.57	6.04	5.01	3.06	0.63	0.46	0.02	0.12	0.15	0.13
09/17/96	3.55	1.31	0.26	NR	0.57	0.10	2.23	0.16	0.46	0.06	10.33	9.57	6.00	4.97	3.05	0.71	0.57	0.12	0.21	0.23	0.21
10/15/96	3.74	1.31	0.24	NR	0.50	0.00	2.16	0.04	0.44	0.00	10.58	9.83	6.11	5.33	2.85	0.28	0.43	0.11	0.16	0.22	0.19
11/13/96	3.37	1.04	0.14	NR	0.49	0.00	2.20	0.00	0.35	0.00	9.31	8.39	5.51	4.07	2.44	0.15	0.29	0.10	0.16	0.21	0.19
12/17/96	3.59	1.32	0.00	NR	0.47	0.00	1.45	0.00	0.28	1.72	10.03	8.95	5.87	4.65	2.60	0.78	0.54	0.01	0.10	0.13	0.15
01/21/97	5.03	1.33	0.00	10.35	0.47	0.00	2.23	0.00	0.28	0.00	10.27	8.86	6.26	4.51	2.80	0.50	0.66	0.00	0.00	0.13	0.13
02/19/97	4.52	1.38	0.00	7.82	0.47	0.00	2.05	0.00	0.22	0.00	9.82	8.81	6.26	4.63	2.64	0.40	0.62	0.00	0.09	0.13	0.13
03/18/97	4.68	1.37	0.00	7.64	0.47	0.00	2.47	0.00	0.22	0.00	9.44	8.29	6.26	4.54	2.52	0.68	0.72	0.02	0.09	0.14	0.13
04/22/97	4.59	1.48	0.00	5.26	0.56	0.00	1.66	0.00	0.27	0.00	9.71	8.84	6.72	4.68	1.64	0.34	0.68	0.04	0.13	0.15	0.15
05/21/97	4.33	1.47	0.00	4.74	0.00	0.00	1.65	0.00	0.35	0.00	9.40	8.06	6.80	4.17	2.40	0.50	0.66	0.13	0.24	0.19	0.17
06/12/97	4.95	1.62	0.28	6.61	0.28	0.12	1.73	0.00	0.38	0.00	10.10	8.39	6.84	4.46	2.70	0.52	0.78	0.23	0.19	0.20	0.23
08/05/97	2.55	1.62	0.28	4.39	0.38	0.12	2.30	0.01	0.37	0.00	11.10	7.06	6.33	3.70	2.39	0.45	1.06	0.23	0.24	0.19	0.21
09/17/97	4.96	1.52	0.20	5.47	0.35	0.08	2.13	0.01	0.32	0.00	10.74	6.71	6.53	3.76	2.50	0.45	1.12	0.13	0.22	0.17	0.15
10/07/97	4.55	1.50	0.05	NR	0.20	0.00	1.37	0.00	0.31	0.00	10.15	6.28	6.42	3.47	NR(U)	0.58	1.09	0.09	0.22	0.16	0.17

NOTES:

All measurements are expressed in feet.

Leachate Head = Well Depth - Depth to Leachate.

NR = No Reading

U = Unstable Reading

LEW-1 installed 10/31/96 - prior to 9/17/97 LEW-1 was labeled LHW-4

Prepared By ESZ 10/16/97

Checked By BLH 10/17

g:junker\ommocl

TABLE 7

SUMMARY OF GAS EXTRACTION WELL ADJUSTMENTS

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	GAS WELL	INITIAL VALVE SETTING	INITIAL VELOCITY (FPM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	REASON FOR CHANGE
04/24/96	GEW-7	0	0	1	690	High methane, low oxygen
05/01/96	GEW-7	1	790	0	0	Low methane
05/06/96	GEW-4	0	0	1	474	Low oxygen, moderate methane
	GEW-5	1	540	0	0	Low methane, high oxygen and balance gas
	GEW-11	2	737	1	366	High oxygen
	GEW-13	1	190	2	1120	High methane
05/15/96	GEW-13	2	950	0	0	Low methane, high balance gas
05/30/96	GEW-4	1	452	0	0	Low methane, high oxygen, and balance gas
	GEW-8	2	840	1	430	High oxygen
	GEW-9	2	380	1	280	High oxygen, low balance gas
06/12/96	GEW-3	0	0	1	910	High methane, low oxygen and balance gas
	GEW-4	0	0	1	980	High methane, low oxygen and balance gas
	GEW-5	0	0	1	0	High methane, low oxygen and balance gas
	GEW-7	0	0	1	0	High methane, low oxygen and balance gas
	GEW-12	20%	290	0	0	Low methane, high balance gas
06/19/96	GEW-3	1	NA	0	0	Low methane, high balance gas
	GEW-4	1	NA	0	0	Low methane, high balance gas
	GEW-7	1	NA	0	0	Low methane, high oxygen and balance gas
	GEW-8	1	NA	0	0	Low methane, high oxygen and balance gas
06/25/96	GEW-8	0	0	1	880	High methane, low balance gas
07/16/96	GEW-5	1	600	0	0	Low methane, high balance gas
	GEW-6	1	550	0	0	Low methane, high balance gas
	GEW-7	0	0	1	360	High methane, low balance gas
	GEW-8	1	1010	0	0	Low methane, high oxygen, and balance gas
	GEW-10	3	760	1	295	Low methane, high oxygen, and balance gas
	GEW-12	0	0	0	300	High methane, low balance gas
	GEW-13	0	0	1	540	High methane, low balance gas
07/24/96	GEW-8	0	0	1	350	High methane, low balance gas

NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

TABLE 7 (cont.)

SUMMARY OF GAS EXTRACTION WELL ADJUSTMENTS

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	GAS WELL	INITIAL FLOW (CFM)	ADJUSTED FLOW (CFM)	REASON FOR CHANGE
12/17/96	GEW-2	10	3	Low methane
	GEW-3	0	5	High methane
	GEW-4	11	5	Low methane
	GEW-5	2-11	12	High methane; drained water in lateral
	GEW-8	23	30	High methane
	GEW-9	2	10	High methane
	GEW-10	22	30	High methane
	GEW-11	21	30	High methane
	GEW-13	0	6	High methane
01/21/97	GEW-2	3	2	Low methane
	GEW-3	5	0	Frozen lateral piping
	GEW-4	1	7	High methane, low oxygen and balance gas
	GEW-5	12	0	Frozen lateral piping
	GEW-7	25	35	High methane, low oxygen and balance gas
	GEW-9	2	5	High methane, low oxygen and balance gas
	GEW-11	26	30	High methane, low oxygen and balance gas
	GEW-12	11	20	High methane, low oxygen and balance gas
02/19/97	GEW-2	5	0	Low methane
	GEW-3	0	5	Lateral thawed
	GEW-4	7	0	Low methane
	GEW-7	34	20	Adjust to determine target flow rate
	GEW-10	27	30	Adjust to determine target flow rate

NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

TABLE 7 (cont.)

SUMMARY OF GAS EXTRACTION WELL ADJUSTMENTS

SEH INC.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	GAS WELL	INITIAL FLOW (CFM)	ADJUSTED FLOW (CFM)	REASON FOR CHANGE
05/20/97	GEW-3	2	0	Low methane
05/20/97	GEW-4	2	0	Low methane
05/21/97	GEW-6	7	5	Adjust to determine target flow rate
05/21/97	GEW-7	8	5	Adjust to determine target flow rate
06/11/97	GEW-3	0	2	High methane
	GEW-4	0	2	High methane
	GEW-12	6	8	Adjust to determine target flow rate
	GEW-13	0	2	High methane
	GEW-14	0	2	High methane

NA = Not Available or Not Applicable NC = No Change from initial setting NR = No Reading

Prepared By ESZ 10/14/97

Checked By DK 10/9 7

g:junker\ommoct

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Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

GREAT LAKES ANALYTICAL 1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-3
Analysis Method: EPA 5030/8021
Lab Number: 710-2261

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
Propylbenzene	0.50	0.10	N.D.
1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	1.2
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	0.38
1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	12
Trichlorofluoromethane	0.50	0.54	3.5
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-4
Analysis Method: EPA 5030/8021
Lab Number: 710-2262

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
-Propylbenzene	0.50	0.10	N.D.
,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.88
Toluene	0.50	0.12	N.D.
,2,3-Trichlorobenzene	2.0	0.60	N.D.
,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
,1,2-Trichloroethane	0.50	0.08	N.D.
richloroethene	0.50	0.16	0.70
Trichlorofluoromethane	0.50	0.54	1.2
2,4-Trimethylbenzene	1.0	0.24	N.D.
3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <4>

Certifications: A2LA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1389 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-5
Analysis Method: EPA 5030/8021
Lab Number: 710-2263

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	N.D.
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	11
Trichlorofluoromethane	0.50	0.54	N.D.
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <6>

Certifications: AACA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP 54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

EH, Inc.	Client Project ID:	Junker Landfill	Sampled: Oct 8, 1997
21 Frenette Drive	Sample Descript:	Water: MW-6	Received: Oct 14, 1997
Chippewa Falls, WI 54729	Analysis Method:	EPA 5030/8021	
ttention: James Thornton	Lab Number:	710-2264	Analyzed: Oct 19-21, 1997
			Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
Propylbenzene	0.50	0.10	N.D.
1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.34
Toluene	0.50	0.12	N.D.
2,3-Trichlorobenzene	2.0	0.60	N.D.
,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,2-Trichloroethane	0.50	0.08	N.D.
ichloroethene	0.50	0.16	0.96
Trichlorofluoromethane	0.50	0.54	N.D.
2,4-Trimethylbenzene	1.0	0.24	N.D.
3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	1.1
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <8>

Certifications: A&LA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

EH, Inc.	Client Project ID:	Junker Landfill	Sampled: Oct 8, 1997
421 Frenette Drive	Sample Descript:	Water: MW-7	Received: Oct 14, 1997
Chippewa Falls, WI 54729	Analysis Method:	EPA 5030/8021	
ttention: James Thornton	Lab Number:	710-2265	Analyzed: Oct 19-21, 1997
			Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
·Propylbenzene	0.50	0.10	N.D.
1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.42
Toluene	0.50	0.12	N.D.
2,3-Trichlorobenzene	2.0	0.60	N.D.
,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,2-Trichloroethane	0.50	0.08	N.D.
ichloroethene	0.50	0.16	7.6
Trichlorofluoromethane	0.50	0.54	N.D.
2,4-Trimethylbenzene	1.0	0.24	N.D.
3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

alytes reported as N.D. were not present above the stated limit of detection.

REAT LAKES ANALYTICAL

vin W. Keeley
Laboratory Director

7102261.SEH <10>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP 54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL 1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-8
Analysis Method: EPA 5030/8021
Lab Number: 710-2266

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
-Propylbenzene	0.50	0.10	N.D.
,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	N.D.
Toluene	0.50	0.12	N.D.
,2,3-Trichlorobenzene	2.0	0.60	N.D.
,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
,1,2-Trichloroethane	0.50	0.08	N.D.
richloroethene	0.50	0.16	N.D.
Trichlorofluoromethane	0.50	0.54	N.D.
2,4-Trimethylbenzene	1.0	0.24	N.D.
3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

John W. Keeley
Laboratory Director

7102261.SEH <12>

Certifications: AALA-461.01, US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL 1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-9
Analysis Method: EPA 5030/8021
Lab Number: 710-2267

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.46
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	5.6
Trichlorofluoromethane	0.50	0.54	N.D.
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <14>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP 54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-10
Analysis Method: EPA 5030/8021
Lab Number: 710-2268

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
-Propylbenzene	0.50	0.10	N.D.
,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	1.1
oluene	0.50	0.12	N.D.
,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	0.64
1,2-Trichloroethane	0.50	0.08	N.D.
richloroethene	0.50	0.16	1.5
Trichlorofluoromethane	0.50	0.54	N.D.
2,4-Trimethylbenzene	1.0	0.24	N.D.
3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <16>

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-11
Analysis Method: EPA 5030/8021
Lab Number: 710-2269

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	.20
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	1.8
Trichlorofluoromethane	0.50	0.54	.80
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <18>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove Illinois 60089 (847) 808-7766 FAX (847) 808-7772

EH, Inc.	Client Project ID:	Junker Landfill	Sampled:	Oct 8, 1997
421 Frenette Drive	Sample Descript:	Water: MW-12	Received:	Oct 14, 1997
Chippewa Falls, WI 54729	Analysis Method:	EPA 5030/8021		
ttention: James Thornton	Lab Number:	710-2270	Analyzed:	Oct 19-21, 1997
			Reported:	Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
Propylbenzene	0.50	0.10	N.D.
1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	1.4
oluene	0.50	0.12	N.D.
2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	1.3
1,2-Trichloroethane	0.50	0.08	N.D.
ichloroethene	0.50	0.16	N.D.
Trichlorofluoromethane	0.50	0.54	6.2
2,4-Trimethylbenzene	1.0	0.24	N.D.
3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <20>

Certifications: AALA 461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-13
Analysis Method: EPA 5030/8021
Lab Number: 710-2271

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	2.0
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	.60
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	22
Trichlorofluoromethane	0.50	0.54	4.0
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <22>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP 54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-14
Analysis Method: EPA 5030/8021
Lab Number: 710-2272

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	2.0
Toluene	0.50	0.12	0.46
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	1.0
Trichlorofluoromethane	0.50	0.54	1.8
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <24>

Certifications: A2LA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-15A
Analysis Method: EPA 5030/8021
Lab Number: 710-2273

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	N.D.
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	2.1
Trichlorofluoromethane	0.50	0.54	0.74
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <26>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-15B
Analysis Method: EPA 5030/8021
Lab Number: 710-2274

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.58
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	7.0
Trichlorofluoromethane	0.50	0.54	1.2
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <28>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH 11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089
(847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-15C
Analysis Method: EPA 5030/8021
Lab Number: 710-2275

Sampled: Oct 8, 1997
Received: Oct 14, 1997
Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.74
Toluene	0.50	0.12	2.3
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	0.23
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	6.7
Trichlorofluoromethane	0.50	0.54	N.D.
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <30>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

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SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: MW-16
Analysis Method: EPA 5030/8021
Lab Number: 710-2276

Sampled: Oct 8, 1997
Received: Oct 14, 1997
Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	N.D.
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	N.D.
Trichlorofluoromethane	0.50	0.54	N.D.
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <32>

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: BM-127
Analysis Method: EPA 5030/8021
Lab Number: 710-2277

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.63
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	0.76
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	N.D.
Trichlorofluoromethane	0.50	0.54	6.3
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <34>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL 1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: BM-126
Analysis Method: EPA 5030/8021
Lab Number: 710-2278

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit (ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	N.D.
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	30
Trichlorofluoromethane	0.50	0.54	N.D.
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102261.SEH <36>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: BM-123
Analysis Method: EPA 5030/8021
Lab Number: 710-2279

Sampled: Oct 8, 1997
Received: Oct 14, 1997
Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.58
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	31
Trichlorofluoromethane	0.50	0.54	N.D.
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102279.SEH <2>

Certifications: AALA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
Attention: James Thornton

Client Project ID: Junker Landfill
Sample Descript: Water: BM-125
Analysis Method: EPA 5030/8021
Lab Number: 710-2283

Sampled: Oct 8, 1997
Received: Oct 14, 1997

Analyzed: Oct 19-21, 1997
Reported: Oct 21, 1997

VOLATILE ORGANIC COMPOUNDS (5030/8021)

Analyte	Practical Quantitation Limit (ug/L)	Method Detection Limit(ug/L)	Sample Results µg/L
Naphthalene	8.0	0.36	N.D.
n-Propylbenzene	0.50	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.50	0.08	N.D.
Tetrachloroethene	0.50	0.10	0.94
Toluene	0.50	0.12	N.D.
1,2,3-Trichlorobenzene	2.0	0.60	N.D.
1,2,4-Trichlorobenzene	2.0	0.43	N.D.
1,1,1-Trichloroethane	0.50	0.17	N.D.
1,1,2-Trichloroethane	0.50	0.08	N.D.
Trichloroethene	0.50	0.16	25
Trichlorofluoromethane	0.50	0.54	1.1
1,2,4-Trimethylbenzene	1.0	0.24	N.D.
1,3,5-Trimethylbenzene	1.0	0.26	N.D.
Vinyl chloride	0.20	0.17	N.D.
Total Xylenes	0.50	0.23	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102279.SEH <4>

GREAT LAKES ANALYTICAL
1380 Busch Parkway • Buffalo Grove, Illinois 60089 (847) 808-7766 FAX (847) 808-7772

SEH, Inc.	Client Project ID:	Junker Landfill	Sampled:	Oct 8, 1997
421 Frenette Drive	Sample Descript:	Water: BM-127	Received:	Oct 14, 1997
Chippewa Falls, WI 54729	Analysis Method:	EPA 8270	Extracted:	Oct 15, 1997
Attention: James Thornton	Lab Number:	710-2277	Analyzed:	Oct 17, 1997
			Reported:	Oct 20, 1997

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit µg/L	Sample Results µg/L
2,4-Dinitrotoluene	2.0	N.D.
2,6-Dinitrotoluene	2.0	N.D.
Fluoranthene	2.0	N.D.
Fluorene	2.0	N.D.
Hexachlorobenzene	2.0	N.D.
Hexachlorobutadiene	2.0	N.D.
Hexachlorocyclopentadiene	2.0	N.D.
Hexachloroethane	2.0	N.D.
ndeno(1,2,3-cd)pyrene	2.0	N.D.
sophorone	2.0	N.D.
2-Methylnaphthalene	2.0	N.D.
2-Methylphenol	2.0	N.D.
4-Methylphenol	2.0	N.D.
Naphthalene	2.0	N.D.
2-Nitroaniline	10	N.D.
3-Nitroaniline	10	N.D.
4-Nitroaniline	10	N.D.
Nitrobenzene	2.0	N.D.
2-Nitrophenol	2.0	N.D.
4-Nitrophenol	10	N.D.
N-Nitrosodiphenylamine	2.0	N.D.
N-Nitroso-di-N-propylamine	2.0	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	2.0	N.D.
Phenol	2.0	N.D.
Pyrene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
2,4,5-Trichlorophenol	10	N.D.
2,4,6-Trichlorophenol	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keeley
Laboratory Director

7102279.SEH <6>

Certifications: A2LA-461.01; US Army Corps of Engineers; Delaware HSS-IL069; Illinois EPA-100261; New Jersey DEP-54001; New York DOH-11487; Pennsylvania DEP-68-500; Tennessee DOH-02804; Tennessee DEC; Virginia DGS-00164; Wisconsin DNR-999917160

GREAT LAKES ANALYTICAL

CHAIN OF CUSTODY REPORT

BUS PARK WAY
BUFFALO GROVE, ILLINOIS 60089-4505
(847) 808-7766 FAX (847) 808-7772

Client: SEH | Bill To: | TAT: (5 DAY) 4 DAY 3 DAY 2 DAY 1 DAY 24 HRS

Address: | Address: | DATE RESULTS NEEDED: 10-21-97

TEMPERATURE UPON RECEIPT: on ICE

Report to: | Phone #: ( ) Fax #: ( ) | State & Program: | Phone #: ( ) Fax #: ( ) | AIR BILL NO.

Project: Junker Landfill

Sampler:

PO/Quote #: JUNKE9601.01

	FIELD ID, LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	PRESERVATIVES	NO. CONTAINERS	TYPE CONTAINERS	VOC 8021	SVOC 8270	SAMPLE CONTROL: CRACKED/BROKEN	SAMPLE CONTROL: IMPROPERLY SEALED	SAMPLE CONTROL: GOOD CONDITION	LABORATORY ID NUMBER
1	MW-13	10/9/97		H2O	HCl	3	40ml	✓				✓	7102271
2	MW-14	10/9/97						✓				✓	7102272
3	MW-15A	10/9/97						✓				✓	7102273
4	MW-15B							✓				✓	7102274
5	MW-15C							✓				✓	7102275
6	MW-16							✓				✓	7102276
7	BM-127 (SPOTT)					6	40ml 1 LIT.	✓	✓			✓	7102277
8	BM-126 (STOCKEM)	10/8/97				3	40ml	✓				✓	7102278
9	BM-123 (MARTINEAU)	10/9/97						✓				✓	7102279
10	BM-125 (LOFTUS)	↓		↓	↓	↓	↓	✓				✓	7102283

RELINQUISHED	RECEIVED	RELINQUISHED	RECEIVED
	Doug Fox 10/14/97		
James J. Pinta 10/13/97 14:31			

COMMENTS:

PAGE 2 OF 2

COMMERCIAL TESTING LABORATORY, INC.
514 Main Street, P.O. Box 526
Colfax, Wisconsin 54730
715-962-3121
800-962-5227
FAX - 715-962-4030

SHORT-ELLIOTT-HENDRICKSON

421 FRENETTE DRIVE
CHIPPEWA FALLS, WI 54729

REPORT NO.: 49917/01
REPORT DATE: 10/15/97
DATE RECEIVED: 10/10/97

OWNER: Loftus RM-125

LOCATION:

COLLECTOR:
DATE COLLECTED: 10-09-97
TIME COLLECTED: 17:00

SOURCE OF SAMPLE:

DATE ANALYZED:10-10-97
TIME ANALYZED: 2:00pm

COLIFORM,MFCC: 0 /100 ml

INTERPRETATION: Bacteriologically SAFE

Coliform Bacteria/100 ml

LAB TECHNICIAN: Pam Gane

WI Approved Lab No. 19

< Means "LESS THAN" Detectable Level Approved by:

COMMERCIAL TESTING LABORATORY, INC.
514 Main Street, P.O. Box 526
Colfax, Wisconsin 54730
715-962-3121
800-962-5227
FAX - 715-962-4030

SHORT-ELLIOTT-HENDRICKSON

421 FRENETTE DRIVE
CHIPPEWA FALLS, WI 54729

REPORT NO.: 51180/01
REPORT DATE: 10/31/97
DATE RECEIVED: 10/06/97

WI DNR LAB CERTIF.#617013960

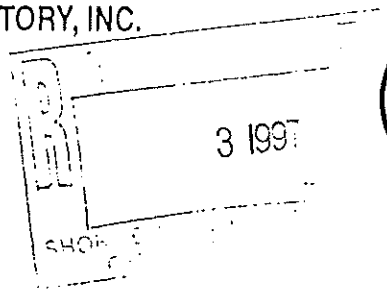
	WW5917 Leachate 10-B Junke9605	Method Code	MDL/LOQ	Date Analyzed
Alkalinity, mg/L	103	SM2320B	5/17	10-10-97
BOD (5 Day),mg/L	146	SM5210B	2/7	10-09-97
Chloride,mg/L	4	325.2	1/3	10-13-97
C.O.D., mg/L	270	410.4	5/17	10-13-97
Conductivity,Micromho/cm	286	120.1		10-28-97
Hardness, mg/L	12	SM2340B	1/3	10-27-97
Ammonia-Nitrogen,mg/L	28	350.1	0.1/0.3	10-14-97
pH (LAB)	7.0	150.1		10-09-97
Tot.Phosphorus, mg/L	< 0.1	365.1	0.1/0.3	10-10-97
T.Susp.Solids,mg/L	8	SM2540D	1/3	10-15-97
Sulfate,mg/L	44	375.4	5/17	10-10-97
Total Iron, mg/L	2.14	200.7	0.009/0.030	10-27-97
Total Manganese,mg/L	0.116	200.7	0.001/0.003	10-27-97
Sodium, mg/L	2.85	200.7	0.150/0.500	10-29-97

*NOTE: No request form, information on bottles.

< Means "LESS THAN" Detectable Level

Approved by:

COMMERCIAL TESTING LABORATORY, INC.
514 Main Street, P.O. Box 526
Colfax, Wisconsin 54730
715-962-3121
800-962-5227
FAX - 715-962-4030



SHORT-ELLIOTT-HENDRICKSON

421 FRENETTE DRIVE
CHIPPEWA FALLS, WI 54729

REPORT NO.: 51133/01
REPORT DATE: 10/31/97
DATE RECEIVED: 10/13/97

WI DNR LAB CERTIF.#617013980

	GW1087 MW-3 10-8	GW1088 MW-4 10-8	GW1089 MW-5 10-8	GW1090 MW-6 10-8	Method Code	MDL/LOQ	Date Analyzed
Project #Junker Landfill/SEH							
Alkalinity, mg/L	285	275	217	370	310.2	5/17	10-17-97
Chloride, mg/L	8	16	10	45	9250	1/3	10-20-97
C.O.D., mg/L	9	< 5	9	78	410.4	5/17	10-22-97
Hardness, mg/L	347	334	274	443	6010	1/3	10-16-97
Dissolved Iron, mg/L	4.86	0.010	< 0.005	8.11	6010	0.005/0.017	10-20-97
Dis. Manganese, ug/L	165	< 1	< 1	1280	6010	1/3	10-27-97

	GW1091 MW-7 10-8	GW1092 MW-8 10-8	GW1093 MW-9 10-8	GW1094 MW-10 10-8	Method Code	MDL/LOQ	Date Analyzed
Project #Junker Landfill/SEH							
Alkalinity, mg/L	223	255	220	178	310.2	5/17	10-17-97
Chloride, mg/L	14	16	11	6	9250	1/3	10-20-97
C.O.D., mg/L	< 5	6	< 5	< 5	410.4	5/17	10-22-97
Hardness, mg/L	283	317	261	257	6010	1/3	10-16-97
Dissolved Iron, mg/L	0.070	< 0.005	0.006	0.012	6010	0.005/0.017	10-20-97
Dis. Manganese, ug/L	14	2	< 1	< 1	6010	1/3	10-27-97

< Means "LESS THAN" Detectable Level

Approved by: PJ

COMMERCIAL TESTING LABORATORY, INC.
514 Main Street, P.O. Box 526
Colfax, Wisconsin 54730
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800-962-5227
FAX - 715-962-4030

SHORT-ELLIOTT-HENDRICKSON

421 FRENETTE DRIVE
CHIPPEWA FALLS, WI 54729

REPORT NO.: 51133/01
REPORT DATE: 10/31/97
DATE RECEIVED: 10/13/97

	GW1095 MW-11 10-9	GW1096 MW-12 10-8	GW1097 MW-13 10-9	GW1098 MW-14 10-8	Method Code	MDL/LOQ	Date Analyzed
Project #Junker Landfill/SEH							
Alkalinity, mg/L	188	350 *	308	394	310.2	5/17	10-17-97
Chloride, mg/L	9	13	16	11	9250	1/3	10-20-97
C.O.D., mg/L	< 5	< 5	6	6	410.4	5/17	10-22-97
Hardness, mg/L	243	468	373	512	6010	1/3	10-16-97
Dissolved Iron, mg/L	0.018	0.066	0.048	0.024	6010 0.005/0.017		10-20-97
Dis. Manganese, ug/L	< 1	5	2	26	6010	1/3	10-27-97

	GW1099 MW-15A 10-9	GW1100 MW-15B 10-9	GW1101 MW-15C 10-9	GW1102 MW-16 10-9	Method Code	MDL/LOQ	Date Analyzed
Project #Junker Landfill/SEH							
Alkalinity, mg/L	234	233	245	251	310.2	5/17	10-17-97
Chloride, mg/L	6	9	9	9	9250	1/3	10-20-97
C.O.D., mg/L	< 5	< 5	< 5	23	410.4	5/17	10-22-97
Hardness, mg/L	266	290	299	325	6010	1/3	10-16-97
Dissolved Iron, mg/L	0.046	0.077	< 0.005	< 0.005	6010 0.005/0.017		10-20-97
Dis. Manganese, ug/L	2	1	< 1	2	6010	1/3	10-27-97

Samples arrived in lab at 2:00pm on 10/13 and were field filtered by SEH.
Samples are not filtered for pH or Conductivity.
*NOTE: RPD was O.D.C. - Reset and reread 3 time.

< means "LESS THAN" Detectable Level

Approved by: RJ

COMMERCIAL TESTING LABORATORY INC.
51 [illegible] P.O. Box 526
Colfax, WI 54730 962-3121 4/95

GROUND WATER TEST PROCEDURES[1]

Parameter and Units	Method	Reference	Equipment
Alkalinity as $CaCO_3$, mg/L	Electrometic Titration (to pH 4.5)	EPA, 1983[6], p. 310.1	- Orion Specific Ion Meter - Model 407A - pH Combination Electrode with Calomel Reference
Ammonia[2] (as N), mg/L	Colorimetric, Automated, Lachat	EPA, 1983[6], p. 350.1	- Lachat Auto Analyzer 1000
BOD, five-day, mg/L	Electrode	Standard Methods[5], p. 5-4, 5210 B.	- Yellow Springs Instrument Model 58 Oxygen Meter
Chloride[2], mg/L	Colorimetric, Automated Ferricyanide	EPA, 1983[6], p. 325.2	- Lachat Auto Analyzer 1000
COD[2], mg/L	Colorimetric, Manual	EPA, 1983[6], p. 410.4	- Bausch & Lomb Spectrophotometer - Spectronic 21
Fluoride, mg/L	Specific Ion Electrode	Standard Methods[5], p. 4-87, 4500-F^- C.	- Orion Specific Ion Meter Model 407A - Orion Fluoride Electrode Model 94-09
Hardness as $CaCO_3$, mg/L	Calculation from determination of calcium & magnesium	Standard Method[5], p. 2-53, 2340 B.	- Fisons Inductively Coupled Plasma (ICP) Model 3410 Plus
Kjeldahl Nitrogen[2] (as N) mg/L	Colorimetric, Semi-Automated Block Digester	EPA, 1983[6], p. 351.2	- Lachat Auto Analyzer 1000
Nitrate[2] (as N), mg/L	Cadium Reduction, Colorimetric, Automated	EPA, 1983[6], p. 353.2	- Lachat Auto Analyzer 1000
Nitrate+Nitrite[2] (as N) mg/L	Cadmium Reduction, Colorimetric, Automated	EPA, 1983[6], p. 353.2	- Lachat Auto Analyzer 1000
Nitrite[2] (as N), mg/L	Colorimetric	EPA, 1983[6], p. 353.2	- Lachat Auto Analyzer 1000

Parameter and Units	Method	Reference	Equipment
Metals[4] (Continued)	Digestion[3] followed by Plasma Emission Spectroscopy for all total metals listed.	EPA, 1983[6], Section 200.7	- Fisons Inductively Coupled Plasma (ICP) Model 3410 Plus
Iron, Total, mg/L			
Magnesium, Total, ug/L			
Manganese, Total, ug/L			
Nickel, Total ug/L			
Potassium, Total, ug/L			
Sodium, Total, ug/L			
Zinc, Total, ug/L			
Lead, ug/L		EPA, 1983[6], Section 200.0	- Perkin Elmer Atomic Absorption - Model 4100ZL Graphite Furnace
Hexavalent Chromium, ug/L	Colorimetric	Standard Methods[5], p. 3-91, 3500-Cr C.	- Bausch & Lomb Spectrophotometer - Spectronic 21

[1]Recommendation for sampling and preservation of samples according to parameters measured found in "Methods for Chemical Analysis of Water and Wastes, 1983" U.S. Environmental Protection Agency, Table 1, pp. xvi-xix.

[2]Samples are filtered through a 0.45 micron (um) filter before being analyzed. A Geo-Tech back flushing filter apparatus with a Geo-Tech peristaltic pump (102 mm-4" diameter filters) is used for filtration. Samples which require preservation are preserved following filtration.

[3]For the determination of total metals sample is not filtered before processing.

[4]Dissolved metals are defined as those constituents which will pass through a 0.45 micron filter. The sample is filtered through a 0.45 micron filter with the Geo-Tech back flushing filter apparatus and then acidified with 1 ml of 1:1 HNO_3 (to a pH of 2) per 250 ml. of filtrate to preserve sample.

[5]Reference: "Standard Methods for the Examination of Water and Waste Water", 17th Edition, 1989.

[6]Reference: "Methods for Chemical Analysis of Water and Waste, 1983", U.S. Environmental Protection Agency, Office of Technology Transfer.

SEH INC.

FIELD SAMPLING REPORT

Site Name: Junker Sanitary Landfill Project: JUNKE9601 Sample Date: 10/8/97

Sample Collector(s): J. Thornton D. Ethridge

Sample Sequence: Page 2 of 2

Weather Conditions: Cloudy Rainy 60° Sample Handling Method: COOLER, ICE

Parameter Info / I.D	WW-12	WW-13	WW-14	WW-15A	WW-15B	WW-15C	WW-16	Condensate	
Type of Well①	PVC	PVC	PVC	PVC	PVC	PVC	PVC	N/A	
Diameter of Well	2"	2"	2"	2"	2"	2"	2"	N/A	
Depth to Bottom	175.00	125.00	92.00	76.00	151.00	200.00	70.00	N/A	
Depth to Water	158.60	111.63	72.32	70.18	70.53	70.15	59.47		
Depth of Water	16.40	13.37	19.68	5.82	80.47	129.85	10.53		
Ref. Elevation Ft MSL	1065.54	1011.85	970.75	924.29	924.52	924.26	915.13	N/A	
Water Elevation Ft MSL	906.94								
Sample Method②	W	A	T	E	P	P	A		
Purging Time/Date	10/8/97	10/9/97	10/8/97	10/9/97	→	→	10/9/97		
Volume Water Purged③	11.48	9.4	13.8	4.1	56.3	91	7.5		
Sampling Time/Date									
Temp. Deg. C.	9°	11°	9°	13°	11°	12°	9°		
Cond. Uncorrected									
Cond. Corrected 25°	650	560	650	420	440	480	530		
pH	6.8	7.4	7.2	7.9	7.8	7.9	7.4		
Odor	N	N	N	N	N	N	N		
Color	N	N	N	N	N	N	N		
Turbidity	N	SL	N	N	N	N	N		

Containers w/Preserve	U	F	U	F	U	F	U	F	U	F	U	F	U	F	U	F	U	F
1																		
2																		
3																		
4																		
5																		

COMMENTS④

Volume/Water Column	
2" Diameter	0.164/ft
4" Diameter	0.65/ft

Instrument Type	Make/Model No.	Cal. Date
pH Meter		
Conductivity Meter		
Gas Meter		
Other		

SEH

TABLE 1
SYSTEM MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	HEADER LINE VACUUM (In.H2O)	BLOWER INLET VACUUM (In.H2O)	BLOWER DISCHARGE PRESSURE (In.H2O)	GAS TO FLARE PRESSURE (In.H2O)	GAS TO FLARE TEMP. (F)	GAS TO FLARE METHANE (%CH4)	GAS TO FLARE CARBON DIOXIDE (%CO2)	GAS TO FLARE OXYGEN (%O2)	GAS TO FLARE BALANCE %	VELOCITY (ft./min)	TOTAL GAS FLOW (Cubic feet/min)	COMMENTS	BY:
01/03/97	NA	NA	-9.70	-28.0	+0.63	-0.07	61	58.5	38.8	0.0	2.7	1097	215	Sampling performed by SEH	BLK
01/07/97	-3	30.36 R	-8.60	-41.5	+0.66	-0.07	67	51.1	36.3	0.1	12.5	1097	215	Sampling performed by SEH	BLK
01/14/97	-4	30.44 F	-9.50	-37.5	+0.62	-0.07	67	47.9	36.7	0.1	15.3	1071	210	Sampling performed by SEH	BLK
01/21/97	33	29.68 F	-10.50	-30.0	+0.56	-0.06	60	55.7	39.2	0.1	5.0	1071	210	Sampling performed by SEH	CU/BLK
01/28/97	-6	30.53 R	-10.10	-30.0	+0.66	-0.06	67	45.0	34.0	0.1	20.9	1046	205	Sampling performed by SEH	BLK
02/04/97	21	30.06 S	-9.40	-29.5	+0.67	-0.06	75	46.6	35.1	0.1	18.2	1046	205	Sampling performed by SEH	BLK
02/11/97	8	30.18 S	-9.70	-30.0	+0.70	-0.07	73	43.7	36.1	0.1	20.1	1020	200	Sampling performed by SEH	BLK
02/19/97	17	30.21 R	-9.80	-30.5	+0.66	-0.07	74	40.6	34.4	0.1	24.9	1020	200	Sampling performed by SEH	CU/BLK
02/28/97	31	29.76 R	-9.50	-30.5	+0.66	-0.07	83	43.0	34.3	0.1	22.6	1020	200	Sampling performed by SEH	BLK
11/12/97	31	30.03 S	-12.0	-29.0	1.50	0.0	82	56.8	37.3	0.1	3.8	1700	333.2	Dropped pressure to be consistent with historical data. Sampled	RNS
11/19/97	23	29.98 F	-13.0	-28.0	1.20	0.0	79	55.6	36.1	0.6	7.8	1600	313.6	Sampling performed by AllPhase	RNS
11/26/97	47	29.95 R	-13.0	-29.0	0.80	0.0	84	52.2	36.8	0.3	10.7	1700	333.2	Sampling performed by AllPhase	RNS
12/04/97	30	29.83 R	-13.0	-29.0	1.00	0.0	83	49.9	36.5	0.2	13.4	1700	333.2	Sampling performed by AllPhase	RNS
12/11/97	35	30.23	-15.0	-29.0	0.80	0.0	79	48.0	35.2	0.2	16.6	1500	294	Sampling performed by AllPhase	RNS

NOTE
(1) If a gauge was broken or not installed, pressure readings were taken with a GEM-500 at that location.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas velocity converted to gas flow by multiplying fpm x (I 196 for 8 inch pipe; velocities measured with an anemometer
(4) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
NA - Not Available or Not Applicable
NC - No Change from initial setting
NR - No Reading
4/24 and 5/1 - Gas readings taken by tri-gas meter (MSA-Gas Scope)

Prepared by:

Checked by:

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-2

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (in. Hg)	LATERAL PRESSURE (in.H2O)	WELL HEAD PRESSURE (in.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
01/21/97	33	29.68 F	-9.32	+0.16	40	36.1	30.6	0.00	33.3	3	1.1	2	Sampling performed by SEH	BLK
02/19/97	17	30.21 R	-9.80	-0.28	45	29.0	29.1	0.00	41.9	5	1.5	0	Sampling performed by SEH	BLK
11/13/97	25	29.7 S			28	54.0	32.8	0.0	13.2	0	0.0	0.00	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			62	40.1	29.0	0.0	30.9	0	0.0	0.00	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow ZV wellheads installed on 11/5 &96.
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by: _____

Checked by: _____

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

All Phase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-4

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In.H2O)	WELL HEAD PRESSURE (In.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
01/21/97	33	29.68 F	-9.04	+0.21	50	57.6	37.3	0.00	5.1	1	0.6	7	Sampling performed by SEH	BLK
02/19/97	17	30.21 R	-9.50	-0.30	50	22.1	27.9	0.00	50.0	7	1.5	0	Sampling performed by SEH	BLK
11/13/97	25	29.7 S			55	59.6	34.3	0.0	6.1	8	23.4	0.39	Sampling performed by All Phase	RNS
12/15/97	49	29.72 F			52	37.6	32.0	0.0	30.4	7.5	13.8	0.37	Sampling performed by All Phase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by:

Checked by:

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-7

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (in.H2O)	WELL HEAD PRESSURE (in.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
01/21/97	33	29.68 F	-7.80	+0.22	68	51.2	37.1	0.00	11.7	25	12.8	35	Sampling performed by SEH	BLK
02/19/97	17	30.21 R	-9.20	0.62	65	37.0	33.4	0.00	29.6	34	12.6	20	Sampling performed by SEH	BLK
11/13/97	25	29.7 S			68	57.3	37.8	0.3	4.5	25	70.3	1.23	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			67	43.5	35.2	0.0	21.3	24	51.3	1.18	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96.
NA = Not Applicable or Not Available
NC No Change from Initial setting
NR - No Reading

Prepared by: _____

Checked by: _____

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-9

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (in. Hg)	LATERAL PRESSURE (inH2O)	WELL HEAD PRESSURE (inH2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
01/21/97	33	29.68 F	-5.24	-3.26	60	57.2	37.1	0.4	5.3	2	1.1	5	Max Flow for pressure	BLK
02/19/97	17	30.21 R	-5.65	-5.42	60	56.7	37.8	0.3	5.2	5	2.8	NC	Max Flow for pressure	BLK
11/13/97	25	29.7 S			62	65.7	34.1	0.1	0.0	2	6.5	0.10	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			60	61.2	38.0	0.0	0.9	2.5	7.5	0.12	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow ZV wellheads installed on 11/5 &/98.
NA = Not Applicable or Not Available
NC No Change from initial setting
NR - No Reading

Prepared by:

Checked by:

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-11

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (in. Hg)	LATERAL PRESSURE (inH2O)	WELL HEAD PRESSURE (inH2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
01/21/97	33	29.68 F	-4.10	-2.15	68	55.0	36.9	0.0	8.1	28	14.3	30	Sampling performed by SEH	BLK
02/19/97	17	30.21 R	-4.25	-2.20	70	47.2	35.0	0.0	17.8	25	11.8	27	Sampling performed by SEH	BLK
11/13/97	25	29.7 S			68	64.3	35.7	0.0	0.0	18	56.8	0.88	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			67	51.1	36.0	0.0	12.9	13.5	33.9	0.66	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu Flow 2V wellheads installed on 11/5-6/96
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by

Checked by:

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-13

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (in. Hg)	LATERAL PRESSURE (in.H2O)	WELL HEAD PRESSURE (in.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%R2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
01/21/97	33	29.68 F	-7.37	+0.06	50	52.9	35.8	0.0	11.3	14	7.4	14	Sampling performed by 3DI	BLK
02/19/97	17	30.21 R	-7.90	-0.42	50	26.5	28.4	0.0	45.1	10	2.7	3	Sampling performed by SEH	BLK
11/13/97	25	29.7 S			40	55.1	34.9	0.0	0.0	0	0.0	0	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			38	53.2	35.6	0.0	11.2	0	0.0	0	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500.
(5) Landtec Accu-Flow 2V wellheads installed on 11/5/96
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by

Checked by:

TABLE 7

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.

JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-15

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (In.H2O)	WELL HEAD PRESSURE (In.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	INITIAL VALVE SETTING	GAS VELOCITY (FPM)	TOTAL FLOW (CFM)	METHANE FLOW (CFM)	FINAL VALVE SETTING	ADJUSTED VELOCITY (FPM)	BY:
01/21/97	NO READING - FROZEN BUTTERFLY VALVE															BLK
02/19/97	NO READING - FROZEN BUTTERFLY VALVE															BLK

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (in. Hg)	LATERAL PRESSURE (In.H2O)	WELL HEAD PRESSURE (In.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/13/97	25	29.7 S			30	58.2	34.4	0	7.8	0	0	0	Sampling performed by AllPhase	RNS
12/16/97	43	29.95 S			45	60.8	35.2	1	0	0	0	0	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying form x 0.8491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use
(4) Pressure readings taken with a Landtec GEM-500.
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by

Checked by

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-19

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (in. Hg)	LATERAL PRESSURE (in.H2O)	WELL HEAD PRESSURE (in.H2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%O2)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/13/97	25	29.7 S			37	66.0	34.0	0.0	0.0	37	119.9	1.82	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			43	64.1	35.9	0.0	0.0	3	9.4	0.15	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis-St. Paul International Airport
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500
(5) Landtec Accu-Flow 2V wellheads installed on 11/5-6/96
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by:

Checked by:

TABLE 2 (cont.)

GAS EXTRACTION WELL HEAD MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GEW-21

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND (In. Hg)	LATERAL PRESSURE (inH2O)	WELL HEAD PRESSURE (inH2O)	GAS TEMP (F)	METHANE (%CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	GAS FLOW (CFM)	METHANE FLOW (CFM)	ADJUSTED GAS FLOW (CFM)	COMMENTS	BY:
11/13/97	25	29.7 S			35	24.0	17.1	11.8	47.0	0	0.0	0.00	Sampling performed by AllPhase	RNS
12/15/97	49	29.72 F			54	26.3	20.2	8.9	44.7	0	0.0	0.00	Sampling performed by AllPhase	RNS
12/16/97	43	29.95 S			62	68.0	31.8	0.2	0.0	3	10.0	0.15	Sampling performed by AllPhase	RNS

(1) Gas velocity is converted to gas flow by multiplying fpm x 0.0491 for 3 inch pipe.
(2) Barometric pressure from National Weather Service at Minneapolis St. Paul International Airport.
(3) Gas readings measured by a Landtec GEM-500 calibrated prior to use.
(4) Pressure readings taken with a Landtec GEM-500
(5) Landtec Accu Flow 2V wellheads installed on 11/5-8/96
NA = Not Applicable or Not Available
NC - No Change from initial setting
NR - No Reading

Prepared by _____

Checked by _____

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-1B

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.30	0	2.0	18.6	79.4		BLK
02/20/97	37	29.76 F	0.00	0	2.2	18.2	79.6		BLK
12/16/97	43	29.95 S	0.09	0.0	0.1	20.6	79.3	Sampling performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-2B

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.31	40.1	31.3	4.3	24.3		BLK
02/20/97	37	29.76 F	+0.20	55.5	42.2	0	2.3		BLK
12/16/97	43	29.95 S	+0.19	31.8	21	12.3	34.7	Sampling Performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-4A

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (In. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.21	0	0.0	20.3	79.7	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	+0.12	0	2.5	17.2	80.3	Sampling performed by SEH	BLK

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:
Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-5S (Shallow)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.16	3.6	11.6	7.1	77.7	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	+0.06	0.1	2.4	18.1	79.4	Sampling performed by SEH	BLK
12/16/97	43	29.95 S	+0.07	0.5	2.5	18.5	78.5	Sampling performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by: _____

Checked by: _____

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-5D (Deep)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.28	0.3	0.9	19.3	79.5	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	+0.12	9.5	15.5	4.5	70.5	Sampling performed by SEH	BLK
12/16/97	43	29.95 S	+0.08	0.0	1.4	20	78.6	Sampling Performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-6M (Medium)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.21	14.0	10.5	12.1	63.4	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	+0.15	49.0	34.0	0.0	17.0	Sampling performed by SEH	BLK
12/16/97	43	29.95 S	+0.03	54.2	35.8	5	4	Sampling performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-7

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.24	11.7	12.8	9.2	66.3	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	+0.07	6.7	23.4	0.0	69.9	Sampling performed by SEH	BLK
12/16/97	43	29.95 S	-0.05	50	46.4	0.8	2.6	Sampling performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-8M (Medium)

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.06	0.0	0.4	19.8	79.8	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	-0.01	0.0	0.4	20.3	79.3	Sampling performed by SEH	BLK
12/16/97	43	29.95 S	0.0	0	0.5	20.1	79.5	Sampling performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 3

GAS PROBE MONITORING

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

WELL NUMBER: GMW-9

DATE	AMBIENT TEMP (F)	BAROMETRIC PRESSURE AND TREND	PRESSURE (in. of H2O)	METHANE (% CH4)	CARBON DIOXIDE (%CO2)	OXYGEN (%02)	BALANCE %	COMMENTS	MONITORED BY:
01/22/97	18	29.61 R	-0.47	0.0	1.2	18.2	80.6	Sampling performed by SEH	BLK
02/20/97	37	29.76 F	+0.16	0.0	3.5	14.0	82.5	Sampling performed by SEH	BLK
12/16/97	43	29.95 S	0	1.9	6.4	2.8	88.9	Sampling performed by AllPhase	RNS

NA = Not Applicable or Not Available
NR - No Reading

Prepared by:

Checked by:

TABLE 4

WEEKLY CONDENSATE INVENTORY

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	DEPTH OF LEACHATE/ CONDESATE (Inches)	VOLUME OF LEACHATE/ CONDESATE IN TANK (Gallons)	ESTIMATED VOLUME PUMPED INTO TANK (Gallons)	VOLUME ACCUMULATED SINCE LAST MEASUREMENT (Gallons)	VOLUME REMOVED FROM TANK (Gallons)	AVERAGE LIQUID GENERATION RATE (Gallons/Day)
01/07/97	34.50	1588	NA	92	0	13.1
01/14/97	36.50	1711	NA	123	0	17.6
01/22/97	36.75	1726	NA	15	0	1.9
01/28/97	40.00	1893	NA	167	0	23.9
02/04/97	42.00	2051	NA	158	0	22.6
02/11/97	44.50	2206	NA	155	0	22.1
02/18/97	47.00	2361	NA	155	0	19.4
02/26/97	49.00	2484	NA	121	0	17.3
11/12/97		1120	NA	NA	0	
11/18/97		1670	NA	550	0	78.6
11/26/97		2175	NA	505	2175	72.1

NOTE:
(1) NA = NOT AVAILABLE OR NOT APPLICABLE
(2) AVERAGE LIQUID GENERATION RATE = VOLUME ACCUMULATED SINCE LAST MEASURE/DAYS SINCE PREVIOUS MEASURE
(3) HIGH VOLUME OR LIQUID DUE TO LEAK IN PLUG FITTING ON TANK LOADOUT SLAB

Prepared by: _____

Checked by: _____

TABLE 6

BLOWER/FLARE ALARM SUMMARY LOG

AMPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

ALARM DATE	ALARM CAUSE	SOLUTION
01/02/97	Alarm #1 - Flame Failure/Frozen Flame Arrester	Insulated heated line to blower
01/19/97	Alarm #1 - Flame Failure	Cleaned UV Sensor and magnification lens on 1/21/97
06/24/97	System Off For Cap Repairs	
11/04/97	System Start Up Alarm #1 - Flame Failure	Cleaned UV Sensor and magnification lens (condensate on lens)
11/05/97	Auto Dailer Started	Different phone number listed for site
11/06/97	Alarm #1 Flame Failure	Cleaned UV Sensor and magnification lens
11/10/97	Sensor Light Out	Replaced
11/12/97	Flow Adjusted	
11/13/97	Bearing for Blower Ordered	
11/24/97	Phone System Disconnected	
11/26/97	Phone Still Not Connected	
12/01/97	Phone System Operational, Old Number Reconnected	

Prepared by:

Checked by:

TABLE 9

EXTRACTED METHANE VOLUMES

AllPhase Companies Inc.
JUNKER LANDFILL GAS EXTRACTION SYSTEM

DATE	TOTAL FLOW (cfm)	METHANE PERCENT (by volume)	METHANE FLOW (cfm)	VOLUME OF METHANE EXTRACTED (cubic feet)
11/12/97	333.2	58.8	195.9	
11/19/97	313.6	55.6	174.4	
11/26/97	333.2	52.2	173.4	
12/04/97	333.2	49.9	166.3	
November Total			177.5	7,668,000
12/11/97	294	48.0	141.1	
			87.5	

NOTE: Monthly Totals = Monthly Average of Methane Flow x days per month x 1440 minutes per day.

Prepared by:

Checked by: