Countywide Recycling & Disposal Facility
Division of Republic Waste Services of Ohio
3619 Gracemont Street S.W.
East Sparta, Ohio 44626
Phone: 330-874-3855
Fax: 330-874-2426

January 14, 2008

Mr. Ed Gortner
Ohio Environmental Protection Agency
PO Box 1049
Columbus, OH 43216-1049

RE: SUBMITTAL OF THE WORK PLAN FOR DEWATERING AND EXPLOSIVE GAS EXTRACTION SYSTEM (EGES) ENHANCEMENTS PER DECEMBER 31, 2007 F&Os, ORDER NO. 3 COUNTYWIDE RECYCLING AND DISPOSAL FACILITY

Dear Mr. Gortner:

Countywide Recycling and Disposal Facility (Countywide) hereby submits this Work Plan for Dewatering and EGES Enhancements as required by Order No. 3 of the December 31, 2007 F&Os.

Countywide considers this submittal as our compliance with Order No. 3. If you have questions or comments, please do not hesitate to contact me at (330) 874-3855.

Sincerely,

Countywide Recycling and Disposal Facility

Tim Vandersall, P.E.
General Manager

cc: Bill Skowronski, OEPA-NEDO
Kurt Princic, OEPA-NEDO
Jeff Martin, OEPA-CO
Kirk Norris, SCHD
Dan Aleman, CCHD
Todd Hamilton, CWRDF
Clarke Lundell, Republic Services
Michael Beaudoin, Earth Tech
Pete Augustin, AEG

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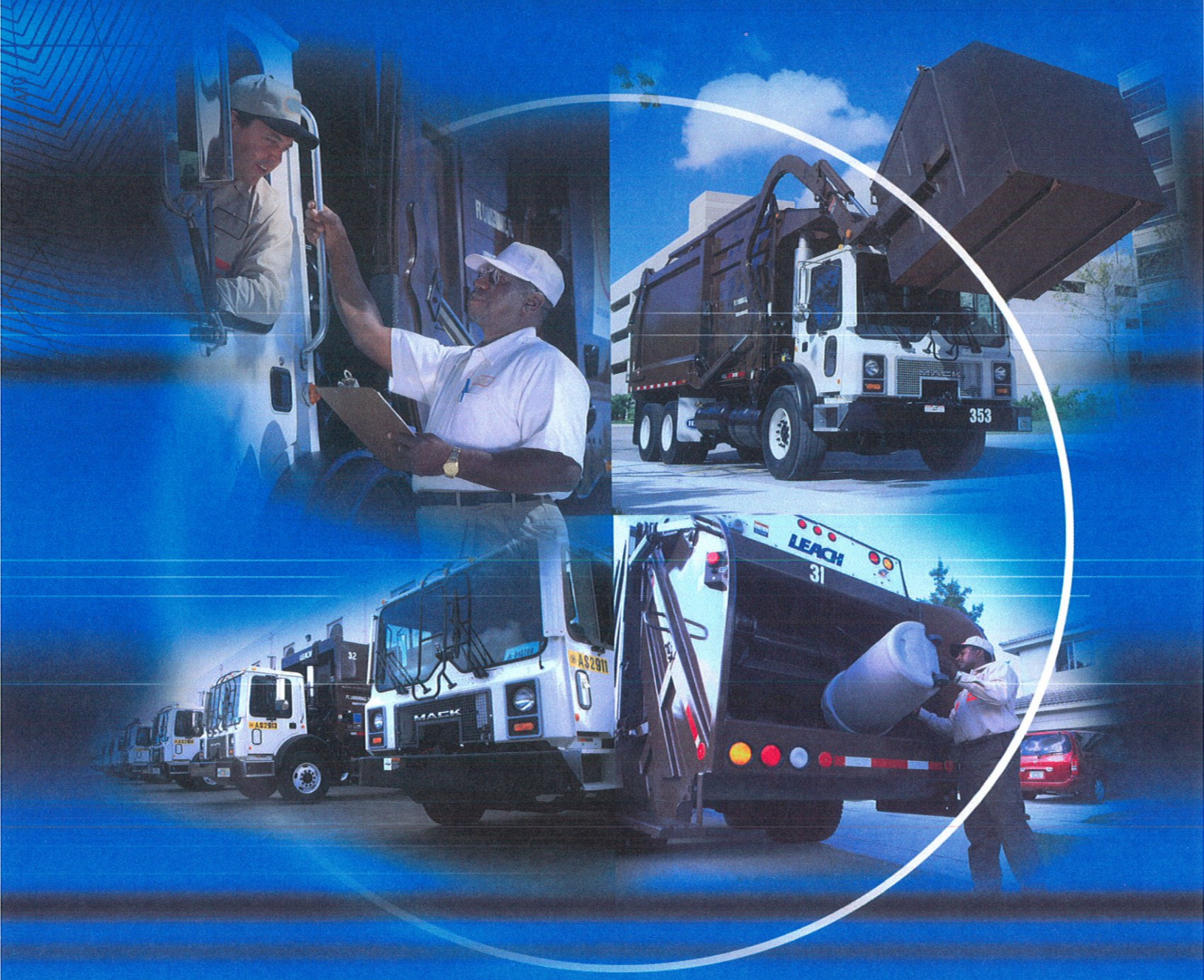


Work Plan for Dewatering and Enhancement of Explosive Gas Extraction System (EGES) Countywide Recycling and Disposal Facility

January 14, 2008

Table of Contents

1.0 INTRODUCTION

On November 7, 2007, and then on December 31, 2007, the Ohio Environmental Protection Agency (OEPA) issued Director's Final Findings and Orders (F&Os) to the Countywide Recycling and Disposal Facility (Countywide). The December 31 F&Os contained requirements regarding dewatering and gas collection at the facility. Specifically, Order No. 3 required the submittal of a "Dewatering and EGES Enhancement Work Plan" (Work Plan). The Order reads:

> *"3. Not later than January 14, 2008, Respondent shall submit a Dewatering and EGES [explosive gas extraction system] Enhancement Work Plan to Ohio EPA for review and approval in accordance with the provisions of Section VI. Review of Submittals, of the March 2007 Orders. Respondent shall undertake dewatering activities in any AGEW [accessible gas extraction well] that has greater than 5 feet of liquid. The dewatering activities required by these Orders shall be initially limited to those wells not listed in Appendix A, attached hereto and incorporated herein. The Dewatering and EGES Enhancement Work Plan shall include dewatering pump installation, identification of priority EGEWs [explosive gas extraction well], procedures for performing dewatering activities for those wells listed in Appendix A except as otherwise provided by Ohio EPA in writing, establishment of achievable drawdown in the EGEWs, construction of infrastructure capable of supporting the EGES and any improvements, relocation of the EGES flares, overall EGES efficiency improvements, establishment of a baseline gas flow, management of investigation derived waste, a schedule for installation of the work, and health and safety provisions for conducting the work.*
>
> *Respondent's Dewatering and EGES Enhancement Work Plan schedule must indicate that:*
>
> *A. Installation of 37 additional dewatering pumps in EGEWs will be completed no later than February 15, 2008, unless an alternative date is established pursuant to Section XII: In-Field Adjustments;*
>
> *B. Construction of infrastructure associated with the 37 additional dewatering pumps will be completed no later than February 15, 2008, unless an alternative date is established pursuant to Section XII: In-Field Adjustments; and*
>
> *C. Installation and testing of new air compressors will be completed no later than January 31, 2008, unless an alternative date is established pursuant to Section XII: In-Field Adjustments."*

Countywide is submitting the Work Plan contained herein as required by Order No. 3. The Work Plan is comprised of the following sections:

Section 2 Current Liquid Conditions at Countywide – describes the presence of liquid in gas wells at municipal solid waste landfills in general and at Countywide specifically.

Section 3 Enhanced Dewatering System – describes the dewatering system construction and operation, including the addition of new gas well pumps, improvement of infrastructure required to operate the gas well dewatering system, and the installation of two new industrial grade compressors.

Section 4 Explosive Gas Extraction System (EGES) Enhancements – describes improvements that are underway and planned for increasing the volume of gas collected at the facility, including addition of new gas wells, replacement of some compromised gas wells, and relocation of two flares.

Section 5 Achievable Drawdown/Baseline Gas Flow Measurement – describes the procedures to be used to achieve drawdown of liquid levels in the gas wells and to determine a gas flow value that will be used to evaluate future performance of the EGES.

Section 6 Health and Safety Provisions – discusses the general requirements for workers constructing and operating the EGES and dewatering system.

Section 7 Schedule and Reporting – describes a proposed implementation schedule (much of the work has either been done or is underway) and a process for reporting on progress.

Figure 1 shows the Site Plan with proposed dewatering and EGES enhancements. In addition, on January 7, 2008, Countywide submitted a Relief Well Installation Work Plan. That Work Plan described the installation of four large-diameter, deep wells that are intended to complement the work described in this Work Plan. For reference, the proposed locations of the four Relief Wells are also provided on Figure 1.

2.0 CURRENT LIQUID CONDITIONS AT COUNTYWIDE

There are many sources of liquid in a typical municipal solid waste landfill (MSW). In the Midwest, MSW is about 25% water upon arrival at the landfill. Then, moisture is added through infiltration of rainwater. At many MSW landfills, leachate is recirculated (this is presently discontinued at Countywide).

This water is liberated from the MSW by compression (squeezing) of the waste as it is buried, by organic decomposition, and by normal seepage. As the liquid moves down toward the leachate collection system, it encounters layers of lower permeability material (more resistant to seepage) and moves sideways until it finds a new path down. When this happens, the liquid can enter the perforations of a nearby gas extraction well and accumulate in the lower portion of the gas well.

It is very common for liquid to accumulate in the lower portions of gas wells at MSW landfills. In fact, it is generally accepted in the industry that, as long as no more than 50% of the perforations are obstructed by liquid, a gas well will function in an efficient manner.

At Countywide, the warmer conditions produced by the reaction speed decomposition and force more water into the gas, which then condenses in the gas wells. Together with the previously stated water sources, this results in greater than typical liquid volume in the gas wells at the site. Attachment A contains a column “Depth to Fluid” that illustrates the current condition of liquid in gas wells at the site.

The presence of liquid in the gas wells does not mean that there is a large, continuous, deep pool of liquid in the landfill. Countywide and OEPA agree that this is not the case at the site and that there is not an excess head of liquid being exerted in this manner on the liner system. A report submitted on December 7, 2007 demonstrated that the leachate collection system under the MSW at the facility is functioning properly and is not subject to excess liquid build-up.

The OEPA has expressed concern that liquid standing in gas wells could perpetuate the rapid oxidation of aluminum waste. Removing water from the well casings will reduce this possibility.

Countywide and OEPA also agree that excessive liquid in a gas well can reduce the efficiency of the gas well to extract gas. In fact, prior to the November 7 and December 31 Orders, Countywide had installed 54 pumps (26 were dedicated dewatering wells) at the site for the express purpose of maintaining an efficient gas extraction system. The work required by the Orders and described in this Work Plan will further reduce liquid levels within the gas wells, thereby exposing more gas well casing perforations for gas collection and increasing the efficiency of the EGES.

3.0 ENHANCED DEWATERING SYSTEM

As previously discussed, Countywide has been dewatering gas wells—for the purpose of maintaining effective gas collection—for some time. Previous dewatering was done on an as-needed basis, ad hoc basis.

However, to achieve the objectives of the November 7 and December 31 Orders, additional improvements and upgrades are necessary. These improvements will result in an engineered, integrated dewatering system consisting of dedicated pumps powered by a robust power network, and connected to an efficient liquid conveyance, storage, and disposal system.

After completion of the proposed dewatering and EGES enhancements, it is anticipated that Countywide will have over 100 dedicated pumps in operation. The following sections of this Work Plan describe criteria for selecting EGEWs for pump installation and describe the components of an enhanced dewatering system.

3.1 Designation of Priority EGEWs for Dedicated Pump Installation

Not all wells will require dedicated pumps. This section describes the criteria to be used to determine which EGEWs will be equipped with dedicated pumps, and the following section details the components of an enhanced dewatering system.

The December 31 Orders allowed certain EGEWs to be temporarily excluded from the dewatering activities (see Attachment D for a list). These excluded EGEWs are located on the eastern and the northern portions of the site because they are areas that are not undergoing reaction and have historically exhibited non- problematic gas management.

Therefore, for this Work Plan, Countywide has focused efforts on a “Priority Area” that includes the remainder of the EGES at the site as illustrated on Figure 1. Wells within this area are called priority EGEWs in this Work Plan.

In order to determine which priority EGEWs are accessible, or capable of being equipped with a pump, an assessment was made. The assessment included insertion of a “dummy” mock up replica of the two different types of low flow dewatering pumps (Vector & AP4). If a dummy could not be advanced to a sufficient depth in an EGEW, then it is considered non-accessible. Within the Priority Area, other EGEWs have also been determined to be non-accessible. A list of reasons for determining that an EGEW is non-accessible follows:

- A dummy could not be advanced to a sufficient depth, indicating that a pump could not be installed in the EGEW,
- The EGEW is known to have a “stinger” which is a devise used to allow continued gas extraction from a compromised EGEW, but which obstructs physical access,
- The EGEW has a “remote” well head which prohibits access for pump installation,
- Settlement can cause cracking and sinking adjacent to an EGEW within the synthetic capped area. This can temporarily hinder physical access, or
- Conditions at the EGEW are such that the downhole temperature is over the boiling point (212 deg. F) allowing water to flash to steam and be ejected to the top of the wells. This

phenomenon has been observed and described as "spitting." (While not indicative of high internal gas pressures or water pressures adjacent to the well, the production of steam can cause high pressures and unstable conditions *within* the well). This results in an unsafe condition for opening the gas well head and prevents pump operation.

If an EGEW does not meet one of these conditions, then it is considered an AEGW (accessible gas extraction well). All AEGWs within the Priority Area are candidates to be equipped with dedicated low-flow pumps (see Figure 1 referencing well designations with a red box). Some of the currently non-accessible wells within the Priority Area will be replaced as discussed in Section 4.0.

In summary, "priority EGEWs" are defined as those AEGWs that are located within the Priority Area shown on Figure 1.

3.2 General System Components

Dewatering of the priority AEGWs at Countywide will be accomplished primarily through the use of dedicated pneumatic pumps. Each pump will be serviced with an HDPE airline for pump activation and an HDPE discharge line to convey the removed liquids to temporary storage tanks prior to offsite disposal.

Previous dewatering efforts at Countywide have been hampered by the use of temporary portable air compressors which have the tendency to shut down when excessive moisture in the condensed air blocks the air line or freezes. Therefore, critical components of the new dewatering system will include construction of robust, permanent air supply and liquid discharge lines (dewatering infrastructure), and the installation of permanent industrial-grade compressors that will be supplied with dehydration units enabling the air to be dried prior to introduction to the distribution system.

3.2.1 Low Flow Dewatering Pumps

Pneumatic pumps are standard in the landfill industry and have been deemed more desirable than electric pumps for this specific application. This is primarily due to their ability to operate at higher liquid temperatures, and the avoidance of an extensive electric distribution system on top of the landfill.

Currently there are two "low-flow" pump models being utilized for this application. Low-flow pumps (that are capable of delivering between 1 to 6 gpm) are commonly used at MSW landfills and are considered sufficient due to the expected low sustained yield. In addition, higher yield pumps would allow fines in the waste to move into the well pack potentially affecting the liquid yield of the EGEW. To prevent this we have selected "low-flow" pump models.

The first of these pumps is the Vector 101HT Pneumatic Piston Pump (Vector), manufactured by Blackhawk Technology Company. The pump motor is located above ground for simplified maintenance. This pump uses a reciprocation motion to force liquid through a check valve at the pump intake. The Blackhawk Vector pump is the only pump that has been proven effective where the downhole temperatures exceed 160 deg. F. This pump works continuously even when the well has no liquid in it and delivers up to 3 gpm.

The second of these pumps is the AP-4/BL LDD (AP-4), manufactured by QED Environmental Systems. The AP-4 pump is a submersible compressed air-driven pump which fills and empties automatically. The pump fills when fluid enters either the top or bottom check valve. Air in the pump chamber exists through the exhaust valves as the fluid fills the pump. The fluid inlet on the AP-4 is located at the bottom of the pump intake cylinder and requires a minimal amount of liquid

head to be actuated, and can deliver up to 6 gpm. The AP-4 has proven effective at Countywide for locations where the downhole temperature is less than 160 deg. F.

Special well head fabrications are needed to use these pumps as illustrated on Figure 2. Brochures are included in Attachment B for pumps which are very similar to the specific pumps being used at Countywide.

In addition to the aforementioned products, research and development of other alternative pumping equipment will continue by Countywide. A prototype of a specially-fabricated "airlift type" pump is currently being tested.

3.2.2 HDPE Air Transmission and Liquid Force Mains (Dewatering "Infrastructure")

Standard 2-inch, SDR 9 HDPE pipe will be utilized to transmit compressed air from the compressors to the low-flow dewatering pumps and SDR 17 HDPE pipe to convey the pump discharge liquids to temporary storage tanks. The HDPE liquid force mains will vary in size from 1 to 1.5 inches at the pump connections and be expanded up to 2 inches for lateral lines and up to 6 inches in diameter for the header lines. Small diameter sample ports will be installed on the discharge lines from the pumps to facilitate future liquid sampling if required.

The resulting pipes form a distribution network that covers the entire Priority Area as shown on Figure 1.

3.2.3 Permanent Air Compressors

In the past, Countywide has used portable, gas-powered compressors to supply air to the pneumatic pumps. Water vapor condensation, distribution limitations, and fuel supply issues have limited the effectiveness of these compressors. The result has been limited up-time for the pumps which are powered by the portable compressors. To solve this problem, a significant upgrade is proposed for the air power system at the site.

Two permanent skid-mounted, electric-powered air compressor systems are proposed to provide industrial quality air to all the proposed pump locations. The proposed location for the compressors will be one on the north side of the 88 acres and the other on the south side of the 88 acres (see Figure 1). Each compressor is a 50 HP screw type compressor manufactured by Kaeser and each are designed to deliver approximately 204 SCFM of air at 100 PSI. Each unit will be supplied with a desiccant filter dryer system, also manufactured by Kaeser, to remove excess moisture from the air prior to transmission to the dewatering pumps. The compressors and dryer units will be containerized skid-mounted units and will be connected to a permanent electric power source.

3.3 Operation of Dewatering System

The operation of a dewatering system at a landfill requires a lot of dedicated effort and heavy maintenance. On a daily basis, a certain number of the pumps will require repair or preventative maintenance. As a result, approximately 30% of the pumps are inoperable at any given time. It is not possible to have replacement pumps that are put in service while a pump is in repair because each pump is specially fabricated to its corresponding gas well depth and well head configuration.

Liquid that is removed by the pumps is transmitted to leachate collection tanks and integrated into the site leachate collection and disposal system.

4.0 EXPLOSIVE GAS EXTRACTION SYSTEM (EGES) ENHANCEMENTS

4.1 Enhancements Proposed in December 7, 2007 Report

On December 7, 2007, Countywide submitted a report "Evaluation of the Existing Landfill Gas Extraction System," pursuant to Order 7 of the November 7 F&Os. This report provided scientific modeling and evaluation of the existing gas collection system, proposed a number of enhancements, and is currently under review by the OEPA. Proposed enhancements in the December 7 report included:

- Installation of four (4) new "bubble-suckers" (to effect vacuum from under the temporary synthetic cap);
- Installation of ten (10) new gas wells (to get better coverage);
- Replacement of five (5) existing gas wells (due to damage);
- Equipping all EGEWs with gas flow measuring devices (see Section 5.1)
- Miscellaneous repairs to laterals and headers (to achieve better available vacuum); and
- Installation of 27 pumps in existing wells.

See Figure 1 for locations of these enhancements and see Table 1 and Figure 2 for details on proposed new gas wells and replacement gas wells. See Attachment C for the construction schedule.

4.2 Additional Proposed Enhancements

Since the December 7 report was submitted, Countywide has had further discussion with OEPA, performed additional review of the EGES, and performed additional field work (e.g. inserting "dummies" into gas wells to determine if pumps could be installed and to determine which gas wells are AEGWs). As a result of this work, Countywide is recommending additional enhancements which should be made prior to establishing the baseline gas flow. These include:

- Relocation of Flares 4 and 6 off the top of the landfill to improve distribution of landfill gas;
- Installation of two, large electric driven air compressors;
- Installation of one new gas well;
- Replacement of seven (7) additional existing gas wells;
- Equipping all EGEWs with gas flow measuring devices (see Section 5.1)
- Upgrade of some header piping; and
- Installation of 17 additional pumps in existing gas wells.

See Figure 1 for locations of these enhancements and see Table 1 and Figure 2 for details on proposed new gas wells and replacement gas wells. See Attachment C for the construction schedule.

4.3 Potential Future Enhancements

OEPA is currently reviewing the December 7 Evaluation of the Existing Landfill Gas Extraction System. Based on their review, further evaluation may be required, and that could lead to additional enhancements. In addition, a number of the gas wells shown on Figure 1 are non-accessible, but still yielding good gas flow, and so are not scheduled for replacement at this time. Countywide will work with OEPA to determine what, if any, potential future enhancements would need to be constructed prior to establishing the baseline gas flow. Note that the schedule provided in Attachment C contains no time provisions for potential future enhancements.

4.4 Management of Waste

Drilling new gas wells will result in about 30 cubic yards cuttings of waste from each borehole. Less than one percent of the cuttings are expected to be aluminum dross material. If dross material is recovered, it will be separated and accumulated in a roll off container during the drilling program. After the drilling program is complete, dross material will be spread on a soil pad, disaggregated, and passivated with a water spray. Then, after cooling, the passivated material will be incorporated into the then current active waste disposal area. Other MSW cuttings will be transported to the active landfill working face, spread to assure that they are cooled, and then incorporated into the daily waste volume.

5.0 ACHIEVABLE DRAWDOWN/BASELINE GAS FLOW MEASUREMENT

One of the stated objectives of OEPA has been to obtain a "baseline gas flow" measurement for the site. The baseline gas flow measurements could be used to evaluate future performance of the EGES.

Prior to commencing the baseline gas flow measurement, gas system enhancements should be in place and the "Gas Extraction Well Achievable Drawdown" values should be established for each priority EGEW.

The process of obtaining achievable drawdown values and performing a baseline gas flow measurement are systematic and time consuming, However, Countywide will operate the dewatering and EGES enhancements immediately after their installation. In this way, the main objectives of the Orders are achieved (enhanced dewatering and gas collection efficiency) while progress is made toward determining the baseline gas flow.

5.1 Installation of Landfill Gas Flow Metering Devices

Landfill gas flow metering devices have been installed and operated at most EGEWs at Countywide. Under normal well operating/dewatering conditions, the landfill gas flow metering device is a 2-inch Landtec Wellhead as manufactured by CES Landtec. The Landtec wellhead is designed to work in conjunction with the GEM 2000 ^{TM} Gas Extraction Monitor. The GEM 2000^{TM} is designed to connect directly to monitoring ports located on the wellhead and provide, gas composition, gas temperature, and gas flow readings. The gas flow readings are derived from an internal pitot tube within the Landtec wellhead itself.

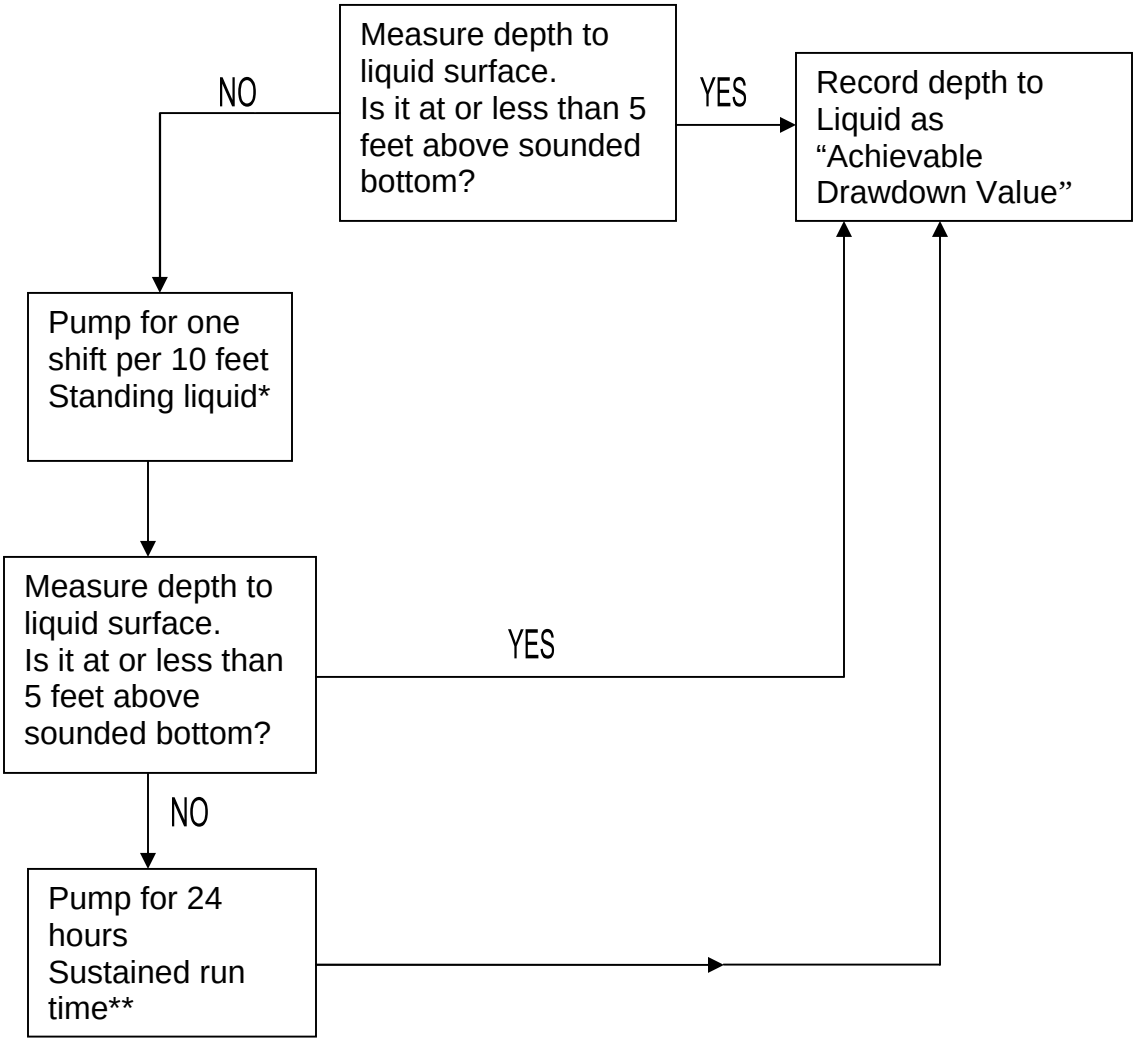
At certain EGEWs, excess gas temperatures, liquids, and/or pressure prohibit the installation and use of the Landtec wellheads (which were not designed for such conditions). Countywide will install gas flow metering devices at these locations consisting of a solid 4-inch HDPE pipe connected to the vertical wells to the vacuum lateral lines. Within the section of solid 4-inch HDPE pipe a 2-inch orifice plate will be installed. Monitoring ports installed on both sides of the orifice plate. A GEM 2000^{TM} will be utilized to measure the differential pressure across the orifice plate, which can then be used to estimate the gas flow rate.

5.2 Obtaining Achievable Drawdown Value on AEGWs in Priority Area Wells

Each priority EGEW will have an associated numeric value for achievable drawdown. This value will be expressed as a number that represents the distance, in feet (rounded to the nearest foot), from the top of the well (or insertion point for the water level cable) and the water surface inside the casing at the time achievable drawdown is deemed to have been accomplished. See Figure 3 for a schematic of achievable drawdown.

One of the keys to achieving good drawdown in the priority EGEWs is to have good "up-time" on the liquid pumps. After the new air compressors are installed (see Section 4.2) and operating reliably, up-time should be significantly increased. After the EGES enhancements are completed (see Section 4.0) and resulting new gas wells are equipped with dewatering installations (if required), the process of obtaining achievable drawdown values can begin.

To facilitate the process, determination of achievable drawdown will be performed on batches of 8 to 12 priority EGEWs at a time. For each batch, the process is illustrated below:



*Does not need to be contiguous shifts
**Sustained run time shall mean that pump is known to have operated for a total of 18 hours in the 24 hour period

Presently, there are about 72 priority EGEWs that will require determination of achievable drawdown values. These EGEWs are shown on Figure 1 with red boxes around the well designation. It is anticipated that it will take a work crew about one week to make these measurements at each batch of wells.

5.3 Preparation of EGEWs Outside the Priority Area

Appendix A of the December 31 Orders were used to delineate the Priority Area on Figure 1. These non-priority EGEWs may be accessible (capable of being equipped with dedicated pumps) but are located in areas that are not undergoing reaction and have historically exhibited non-problematic gas management.

Prior to performing the baseline gas flow measurement, a reasonable attempt will be made to ensure that these non-priority EGEWs are contributing gas flow efficiently. For these EGEWs a portable pump will be used to purge the well casing of any excessive liquid. The goal during this purging effort will be to expose at least 50% of the available perforations during a one-time purging event. While these efforts will be made, there will not be an "achievable drawdown" value associated with non-priority wells.

It is possible that some wells which are presently outside the Priority Area may warrant further attention prior to performing the baseline gas flow measurement. In such cases, Countywide will seek agreement on a course of action and corresponding adjustments that may need to be made to the schedule.

5.4 Treatment of Non-Accessible EGEWs

Some non-accessible gas wells are producing good gas but cannot be equipped with a pump due to presence of a "stinger", a pinched casing, or a remote well head piping arrangement. These EGEWs will be included in the baseline gas flow measurement, but no dewatering or other preparation will be performed. Non-accessible EGEWs are shown on Figure 1 with a "hollow" well symbol.

5.5 Determination of Baseline Gas Flow

The OEPA's stated purpose of the baseline gas flow measurement is to assign an optimized gas flow value to each gas well during optimum conditions. These conditions will be achieved when perforations are exposed to the extent practical.

After determining the achievable drawdown for each priority AEGW, and after preparing the non-priority gas wells, the well field will be ready for performance of the one-time baseline gas flow measurement event. Since the achievable drawdown values are determined in ideal conditions, it is not anticipated that it will be feasible to have every priority EGEW attain that condition at the same time. Therefore, we initially propose that the baseline flow measurements be performed when 70% of the priority EGEWs in the well field are at their associated achievable drawdown value. The determination of baseline gas flows will proceed as follows:

1. Balance/tune the well field using sound, standard industry practice, while maintaining compliance with Order 4.B of the March 28 Orders (1.5% oxygen limitation);
2. Measure liquid levels and record the downhole temperature profile of each well;
3. When current measurements* indicate that 70% of the AEGWs are at their associated achievable drawdown value, obtain a gas flow measurement (in cubic feet per minute, cfm) and gas chemistry (with the GEM 2000) at each priority and non-priority EGEW on the site. This will constitute the baseline gas flow measurement event.

   * current shall mean a reading that was taken no more than two weeks prior

If, prior to the date indicated in the schedule contained in Attachment C, it is determined that it is not possible to achieve the target of 70% of the priority EGEWs at their achievable drawdown value, Countywide will work with OEPA to determine an alternate acceptable target and conduct baseline measurements accordingly.

5.6 Operation of EGES Post-Baseline Flow Measurement

After measuring baseline gas flow, Countywide will continue to tune the well field. Monthly, a well field tuning event will be compared to the baseline gas flow measurements. If gas flow from a gas well indicates a significant drop from the measured baseline gas flow during two consecutive monthly tuning events, a "condition assessment" will be undertaken. The condition assessment will require a determination if the gas flow is due to one or more of the following factors:

1. Liquid obstruction of perforations,
2. Physical compromise of well casing,
3. Physical obstruction in associated lateral or header line,
4. Reduction in available gas due to decrease in gas-generation in the vicinity, or
5. Reduction in available gas due to redistribution of gas in the vicinity (as noted by a corresponding increase in gas in nearby gas wells).

The results of the condition assessment will be provided to the OEPA with a recommendation for remedy which may include one or more of the following:

- If the cause of flow reduction is No. 1, liquid pumping should be initiated or improved.
- If the cause of flow reduction is No. 2, or 3, the physical obstruction should be removed or repaired, or the problematic well or pipe should be scheduled for replacement.
- If the cause of flow reduction is due to a decrease in the available gas, no corrective action is necessary.

AEGWs which require condition assessment will be added to the Weekly Progress Report (see Section 7) and remain on the report until a determination has been made that the reduction is due to a decrease in available gas or until the AEGW has been restored to near the baseline gas flow measurement.

6.0 HEALTH AND SAFETY PROVISIONS

The construction crews, sampling teams, and operation and maintenance personnel must all be covered by a Countywide-approved Health and Safety Plan that meets their specific company's requirements. For drilling activities, the Health and Safety Plan must address the normal hazards of drilling through waste and the special hazards that exist in the reacting areas within the 88-acre area at Countywide. At a minimum, the Health and Safety Plan will include provisions for safety and protection of drilling personnel including:

1. Drilling personnel must have 40-hour OSHA Hazwoper training for operation within the Priority Area.
2. Supplied air will be available on site during the drilling operation. Should its use become necessary, all personnel required to use the equipment will be properly trained and fit-tested.
3. Each work crew to be equipped with 4-gas meters (carbon monoxide, methane, hydrogen sulfide, and oxygen) with audible alarms
4. All personnel will wear Level D PPE at all times including:
    a. ANSI approved hard hat with removable full-face shield
    b. High-visibility reflective vest
    c. Full-length pants
    d. Steel-toed boots, and
    e. Safety glasses, hearing protection, and other task-specific protection shall be utilized when deemed appropriate.
5. A readily-accessible 2A and 5BC fire extinguisher shall be available at drilling operations.

In addition, the Health and Safety Plan that covers the drilling operations must define an "exclusion zone" within which observers may not enter unless specifically allowed by the drilling crew chief.

7.0 SCHEDULE AND REPORTING

The installation of pumps, enhancements of the EGES, attainment of achievable drawdown, and measurement of baseline gas flow must be approached in a systematic manner. A proposed schedule is presented in Attachment C.

The process of obtaining achievable drawdown values and performing a baseline gas flow measurement are systematic and time consuming. However, Countywide will operate the dewatering and EGES enhancements immediately after their installation. In this way, the main objectives of the Orders are achieved (enhanced dewatering and gas collection efficiency) while progress is made toward determining the baseline gas flow.

Several milestone dates were provided with the December 31 F&Os. The schedule provided in Attachment C indicates that those milestone dates are on track to be completed by the required time. Countywide will make every practical effort to prosecute the work to meet this schedule; however, it should be noted that the first part of this schedule occurs in difficult weather or site conditions which may have a significant impact on the progress of activities.

Recognizing this, the OEPA included Section XII, In-Field Adjustments, in their December 31 Orders. This allows accommodation of changed conditions due to weather and other unexpected field conditions. When such a condition materially impacts an Order-specified milestone, Countywide will submit a written request a change in the schedule.

On a weekly basis, consistent with Order No. 5 of the December 31 F&Os, Countywide will submit a Progress Report. This report will include a table that details all work performed that week as well as anticipated work to be undertaken in the next week. In addition, any major schedule impacts will be discussed in the Weekly Progress Report.

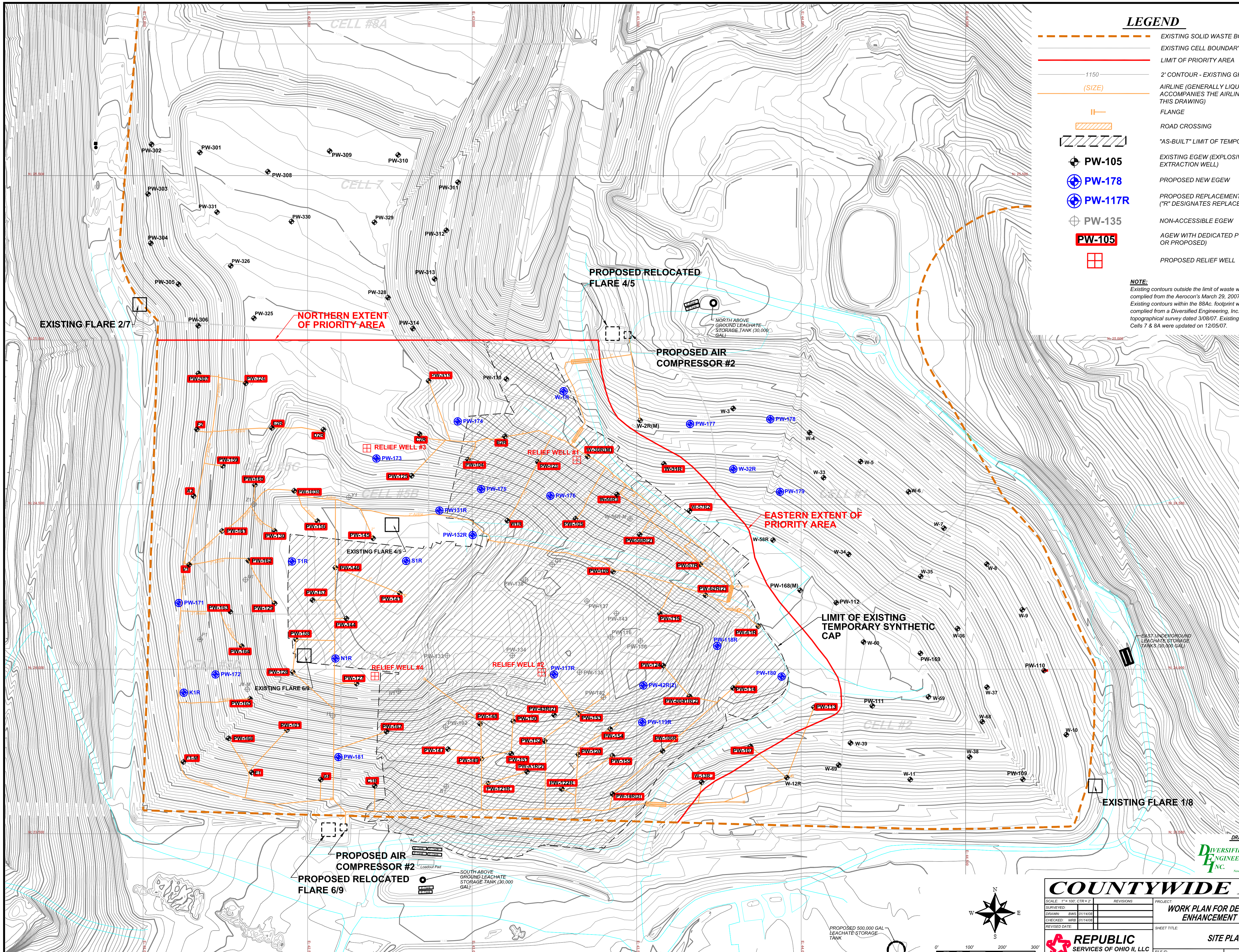
TABLE 1
PROPOSED NEW AND REPLACEMENT GAS WELLS
EGES ENHANCEMENTS JANUARY 14, 2008

WELL ID	*COORDINATES*		*ELEVATIONS*		*Total Refuse Depth (ft.)*	*Bore Depth (ft.)*	*Solid Pipe (ft.)*	*Perf Pipe (ft.)*
	North	*East*	*Ground Surf.*	*Liner*				
NEW GAS WELLS								
PW-171	24201	42109	1174	1115	59	49[(1)]	15	34
PW-172	23984	42220	1198	1065	133	113	20	93
PW-173	24640	42709	1230	1057	173	120	20	100
PW-174	24753	42956	1198	1074	124	104	20	84
PW-175	24547	43028	1239	1059	180	120	20	100
PW-176	24527	43238	1216	1058	158	120	20	100
PW-177	24745	43663	1145	1090	55	45[(1)]	15	30
PW-178	24760	43906	1141	1096	45	35[(1)]	15	20
PW-179	24539	43936	1178	1101	77	57	20	37
PW-180	23978	43941	1214	1106	108	88	20	68
PW-181	23733	42594	1191	1076	115	95	20	75
REPLACEMENT GAS WELLS								
K1R	23929	42124	1166	1094	72	52	15	37
N1R	24032	42585	1265	1059	206	120	20	100
S1R	24329	42800	1274	1059	215	120	20	100
T1R	24327	42453	1264	1057	207	120	20	100
W-1R	24845	43278	1157	1095	62	52[(1)]	15	30
W-32R	24608	43794	1169	1099	70	50	15	35
PW-42R(2)	23951	43521	1246	1108	138	118	20	98
PW-117R	23984	43249	1239	1062	177	120	20	100
PW-118R	24071	43745	1219	1107	112	92	20	72
PW-119R	23839	43517	1224	1108	116	96	20	76
PW-131R	24482	42901	1265	1061	204	120	20	100
PW-132R	24407	43002	1261	1059	202	120	20	100

NOTES:

1. Prior to drilling these wells written authorization must be obtained by the site engineer as the scheduled boring depth is to within 10 feet of the liner system.
2.This schedule is **not** to be used for construction purposes.

REVISION 1/10/08



LEGEND

Symbol	Description
(orange dashed line)	EXISTING SOLID WASTE BOUNDARY
(grey line)	EXISTING CELL BOUNDARY
(red line)	LIMIT OF PRIORITY AREA
1150	2' CONTOUR - EXISTING GROUND
(SIZE)	AIRLINE (GENERALLY LIQUID DISCHARGE ACCOMPANIES THE AIRLINES SHOWN ON THIS DRAWING)
	FLANGE
	ROAD CROSSING
	"AS-BUILT" LIMIT OF TEMPORARY CAP
PW-105	EXISTING EGEW (EXPLOSIVE GAS EXTRACTION WELL)
PW-178	PROPOSED NEW EGEW
PW-117R	PROPOSED REPLACEMENT EGEW ("R" DESIGNATES REPLACEMENT)
PW-135	NON-ACCESSIBLE EGEW
PW-105	AGEW WITH DEDICATED PUMP (CURRENT OR PROPOSED)
	PROPOSED RELIEF WELL

NOTE:
Existing contours outside the limit of waste were compiled from the Aerocon's March 29, 2007 aerial topo. Existing contours within the 88Ac. footprint were compiled from a Diversified Engineering, Inc. topographical survey dated 3/08/07. Existing contours in Cells 7 & 8A were updated on 12/05/07.

DRAWN BY:

DIVERSIFIED ENGINEERING INC.

COUNTYWIDE RDF

SCALE: 1" = 100', CTR = 2'		
SURVEYED:		
DRAWN:	BWS	01/14/08
CHECKED:	MRB	01/14/08
REVISED DATE:		

REVISIONS

PROJECT: WORK PLAN FOR DEWATERING & ENHANCEMENT OF EGES

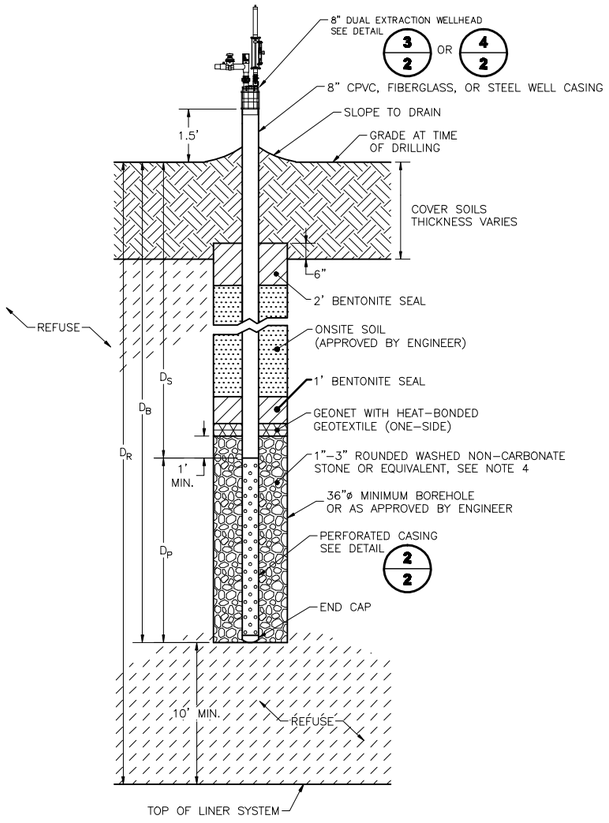
SHEET TITLE: SITE PLAN

REPUBLIC SERVICES OF OHIO II, LLC
Stark County, Ohio

FILE ID: Gas System As-Built for Dewatering Program

FIGURE 1

\\Alpha\ALPHA-DATA\Data\LANDFILLS\Countywide Landfill\Gas Control System\2007 Gas Control & Collection System\Gas System As-Built for Dewatering Program.dwg, 1/14/2008 10:04:45 AM



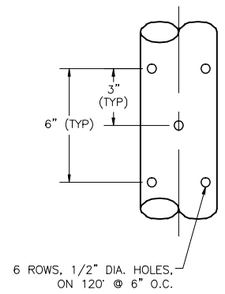
GAS EXTRACTION WELL

DETAIL 1/2

SCALE: NOT TO SCALE

NOTES:

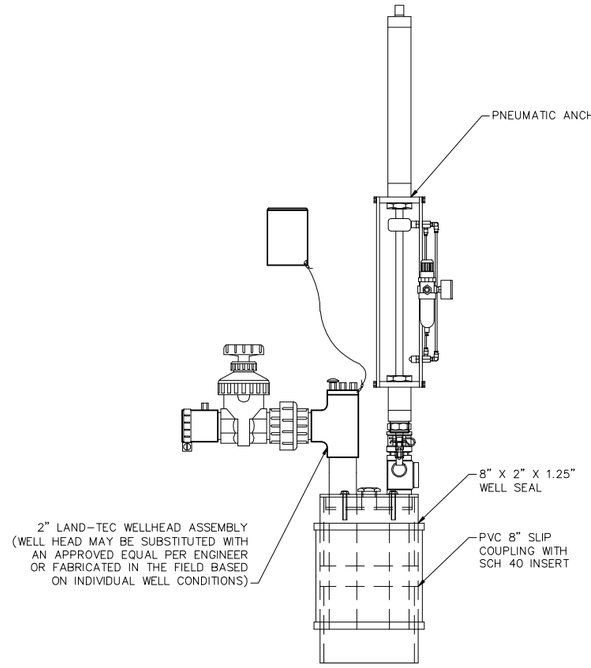
1. D_R = DEPTH OF REFUSE
   D_B = DEPTH OF BORING
   D_S = DEPTH OF SOLID PIPE (BELOW GRADE)
   D_P = LENGTH OF PERFORATED PIPE
2. D_B ~ 75% D_R, 140 FEET MAXIMUM.
3. MINIMUM 10 FEET SEPARATION BETWEEN BASE OF BORING AND TOP OF LINER SYSTEM.
4. LIMESTONE, CRUSHED CONCRETE, AND LIKE MATERIALS ARE NOT APPROVED BACKFILL MATERIALS. TIRE CHIPS MAY BE APPROVED BY ENGINEER.
5. OTHER APPLICABLE MATERIALS MAY BE SUBSTITUTED FOR WELL CASING.
6. CASING SIZE AND WELL BORE DIAMETER MAY BE MODIFIED TO ACCOMMODATE FIELD CONDITIONS.
7. CUTTINGS FROM DRILLING TO BE TRANSPORTED TO THE ACTIVE WORKING FACE AND SPREAD TO ENSURE SUFFICIENT COOLING BEFORE BEING INCORPORATED WITH DAILY WASTE STREAM.



PERFORATED PIPE

DETAIL 2/2

SCALE: NOT TO SCALE

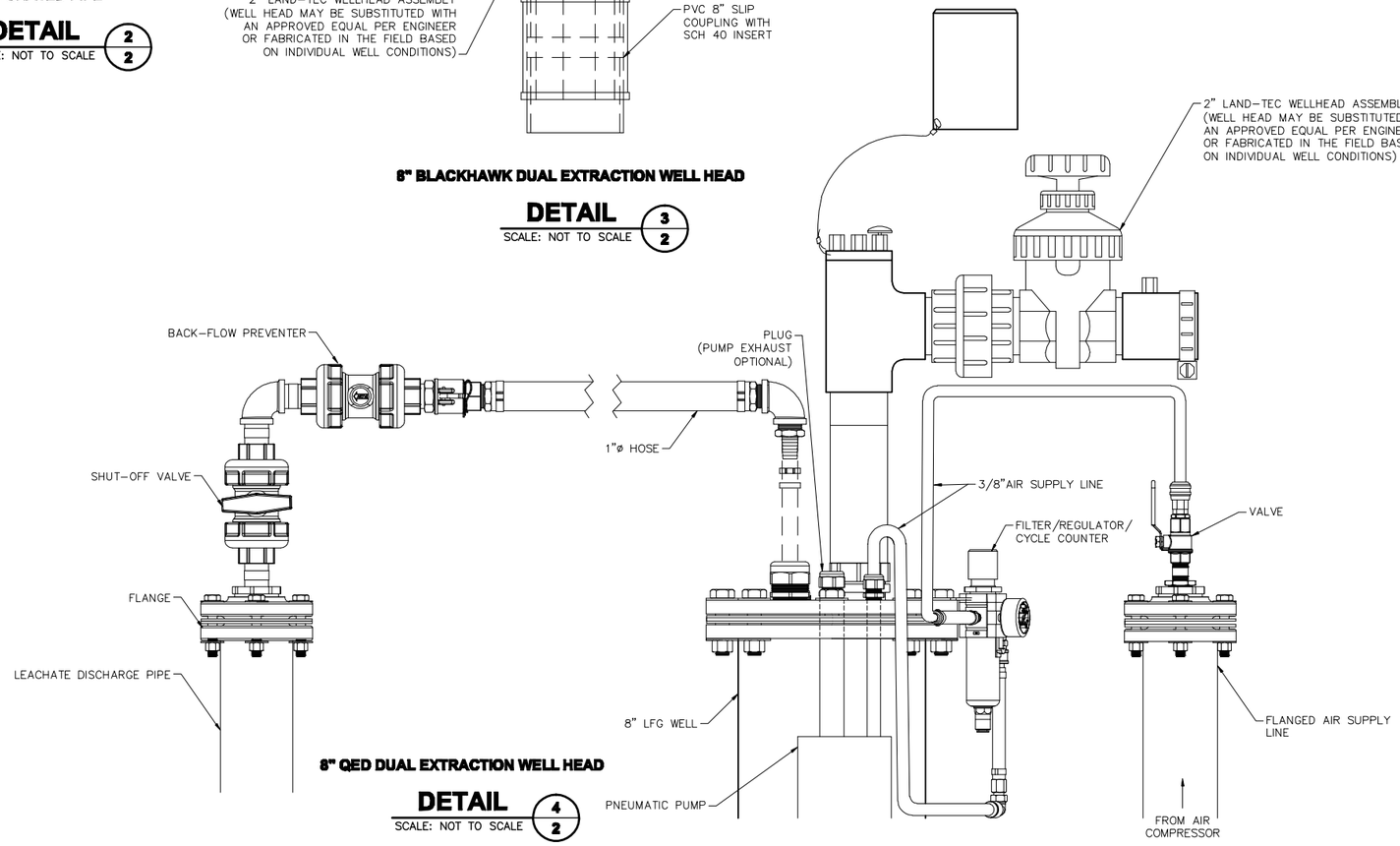


8" BLACKHAWK DUAL EXTRACTION WELL HEAD

DETAIL 3/2

SCALE: NOT TO SCALE

NOTE:
DETAILS 3/2 AND 4/2 ON THIS FIGURE ARE FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL DUAL EXTRACTION WELL HEAD WILL BE FINALIZED IN THE FIELD.



8" QED DUAL EXTRACTION WELL HEAD

DETAIL 4/2

SCALE: NOT TO SCALE

NOTE:
THE USE OF SLOTTED PIPE FOR THE VERTICAL LFG WELL CASINGS WAS CONSIDERED FOR THIS PROJECT. HOWEVER, BASED ON EXPERIENCE AT OTHER LANDFILLS WITH DUAL LFG AND LEACHATE EXTRACTION WELLS, IT HAS BEEN DECIDED TO CONTINUE USING CIRCULAR PERFORATIONS FOR THE WELL CASING. THIS IS PRIMARILY BECAUSE SLOTS IN THERMOPLASTIC WELL CASINGS TEND TO CLOSE UP DUE TO THE EXPANSION PROPERTIES OF THIS MATERIAL IN WARM ENVIRONMENTS. IN SOME CASES, THESE SLOTS HAVE BEEN KNOWN TO COMPLETELY CLOSE AND STOP ALL LFG FLOW AND ALL LEACHATE FLOW INTO A WELL.

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE 01/14/08
DRAWN BY TSS
DESIGNED BY MC
CHECKED BY PDL
APPROVED BY BOS

CORNERSTONE Environmental Group, LLC

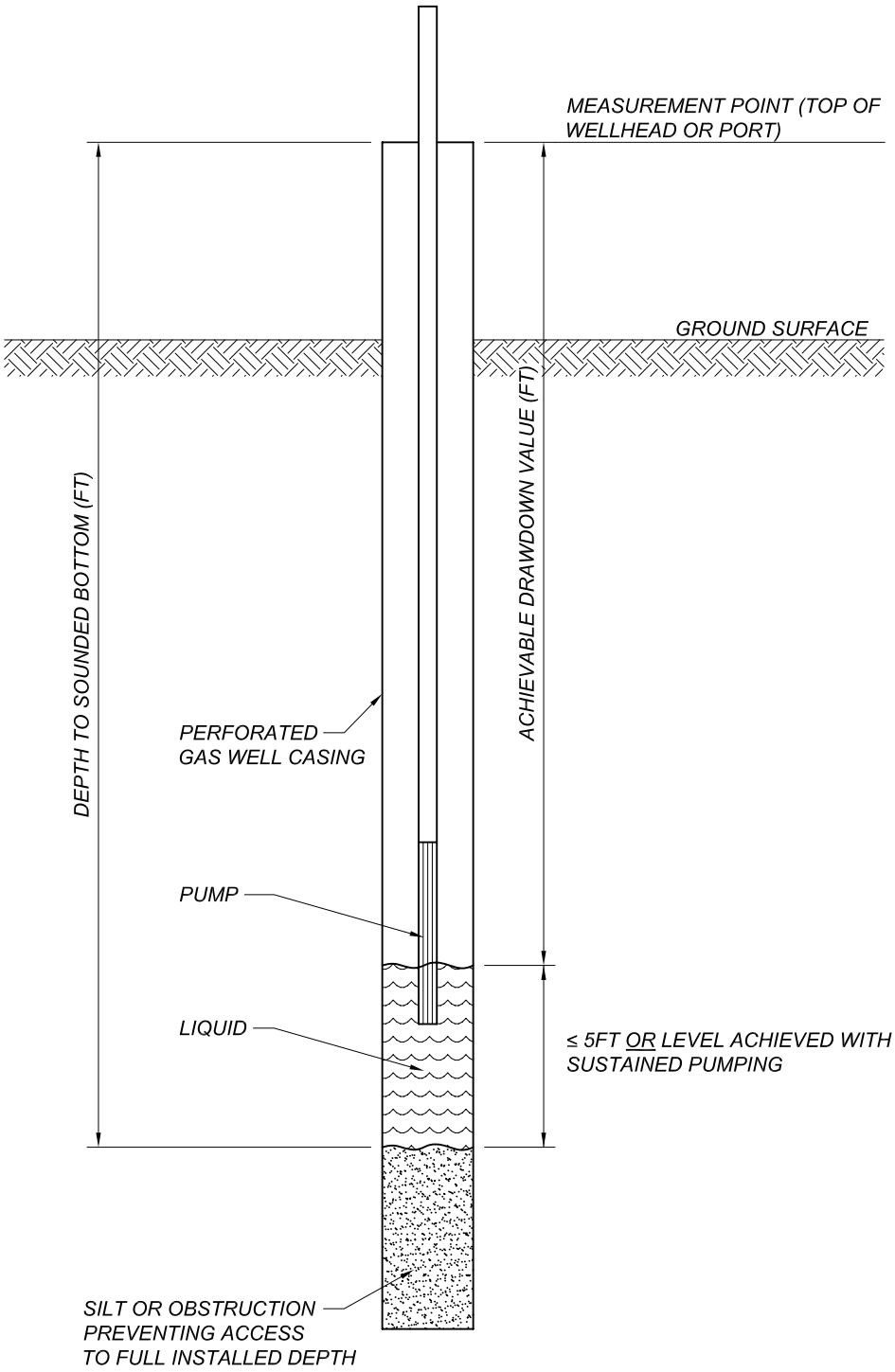
COUNTYWIDE RDF
EAST SPARTA, OHIO
WORKPLAN FOR THE DEWATERING AND ENHANCEMENT OF EGES

DETAILS FOR NEW AND REPLACEMENT GAS WELLS

FIGURE NO. **2**

PROJECT NO. 70187

1" 1 1/2" 0" 1"



COUNTYWIDE RDF

SCALE: NO SCALE			REVISIONS	
SURVEYED:				
DRAWN:	BWS	01/14/08		
CHECKED:	MRB	01/14/08		
REVISED DATE:				

PROJECT:
DEWATERING & EGES ENHANCEMENT WORK PLAN

SHEET TITLE:
ILLUSTRATION OF ACHIEVABLE DRAWDOWN VALUE

REPUBLIC SERVICES OF OHIO II, LLC
Stark County, Ohio

FILE ID: Illustration of Achievable Drawdown Value.dwg

FIGURE 3

ATTACHMENT A

DEPTH TO LIQUID TABLE

Countywide RDF East Sparta, OH
Well Log Asbuilt Information
Report UpDated: 12-20-07

	Desing/As-Built Information					Dec. 2007 Readings			
Alias (Site plan designation)	Well Log Bore Depth	Solid Pipe Below Ground	Solid Pipe Stick-up Above Ground	Total Solid Pipe or Depth to Perforated Pipe (F+G+H)	Total Perforated Pipe	Date	Depth To Fluid	Depth To Bottom	Is there a pump in the well?
Id.	FT	FT	FT	FT	FT		FT	FT	
PW-A1R2	58.0	20.0	3.5	23.5	38.0	12/20/2008	26.2	58.0	Y
PW-167	118.0	20.0	3.0	23.0	98.0	12/14/2007	3.8		Y
PW-308	86.0	20.0	5.0	65.0	66.0	12/14/2007	27.8	116.5	N
PW-151	41.0	18.0	2.0	20.0	23.0	12/4/2007	10.5	40.2	Y
PW-313	56.0	56.0	6.0	62.0	15.0	12/5/2007	56.7	59.5	N
PW-147	51.0	18.0	2.0	20.0	33.0	12/4/2007	10.0	56.5	Y
C1R	43.0	18.0	4.0	22.0	24.0	12/14/2007	14.9	41.0	Y
PW-149	49.0	18.0	2.0	20.0	31.0	12/4/2007	11.0	49.0	Y
W-32	78.0	33.0	4.0	37.0	45.0	12/13/2007	24.3	26.1	N
PW-102	75.0	15.0	3.0	18.0	60.0	11/12/2007	5.0	37.4	N
PW-148	51.0	18.0	2.0	20.0	33.0	12/14/2007	14.7	47.9	Y
PW-123	75.0	15.0	3.0	18.0	60.0	12/14/2007	10.6		Y
W-1	43.0	18.0	4.0	22.0	25.0	12/14/2007	20.7	21.5	N
PW-142	109.0	18.0	2.0	20.0	91.0	12/4/2007	17.6	74.6	N
PW-105	60.0	15.0	3.0	18.0	60.0	12/13/2007	22.1	69.1	Y
W-30R(M)	95.0	20.0	2.0	22.0	75.0	12/14/2007	28.7	92.3	Y
B2R	75.0	20.0	4.0	24.0	54.0	12/14/2007	29.2	59.6	Y
W-56R(3)	85.0	20.0	4.0	24.0	64.0	12/14/2007	31.1		Y
PW-132	118.0	15.0	3.0	18.0	103.0	12/3/2007	29.6	51.7	N
W-13R	40.0	18.0	4.0	22.0	21.0	12/5/07	24.5	42.6	Y
PW-56R(2)	100.0	15.0	3.0	18.0	84.0	12/13/2007	29.6	94.4	Y
W1R	85.0	20.0	4.0	24.0	64.0	12/14/2007	33.2	82.3	Y
PW-108	75.0	15.0	3.0	18.0	60.0	12/13/2007	28.3	59.8	Y
PW-43R(2)	100.0	15.0	3.0	18.0	84.0	12/7/2007	32.6	89.6	Y
S1	136.0	20.0	5.0	25.0	116.0	12/13/2007	46.0	53.7	N
K1	64.0	19.0	5.0	24.0	44.0	12/6/2007	32.0	32.0	N
PW-62R(2)	88.0	15.0	3.0	18.0	73.0	12/13/2007	31.3	69.1	Y
D1	52.0	15.0	6.0	21.0	36.0	12/14/07	27.7	52.5	Y
PW-141	112.0	18.0	2.0	20.0	94.0	12/15/2007	37.5	111.2	Y
PW-120	75.0	15.0	3.0	18.0	60.0	12/7/2007	29.3	60.2	Y
PW-166	115.0	23.0	4.0	27.0	95.0	12/14/07	46.1	117.5	Y
W-58R	79.0	20.0	4.0	24.0	58.0	12/13/2007	36.4	82.0	N
PW-117	75.0	18.0	0.0	18.0	60.0	12/4/2007	31.3	51.6	N
W-14R(3)	40.0	18.0	4.0	22.0	21.0	12/4/2007	27.1	42.2	Y
PW-119	75.0	18.0	0.0	18.0	60.0	12/4/2007	33.0	33.0	N
PW-152	40.0	18.0	2.0	20.0	22.0	12/15/2007	25.6	42.2	Y
PW-118	55.0	18.0	0.0	18.0	40.0	12/3/2007	28.9	54.8	N
W-42R	100.0	20.0	4.0	24.0	79.0	12/4/2007	45.6	62.0	N
PW-309	63.0	20.0	5.0	45.0	43.0	12/13/07	58.1	68.2	N
W-38	75.0	14.0	8.0	22.0	57.0	12/5/2007	39.6	68.4	N
PW-315	70.0	20.0	5.0	25.0	50.0	12/14/2007	41.2	62.1	N
W-8	30.0	15.0	4.0	19.0	15.0	12./5/07	23.9	32.9	N
PW-121R	30.0	17.0	6.0	23.0	19.0	12/14/2007	29.3	30.9	Y
W-31R	90.0	18.0	2.0	20.0	72.0	12/13/2007	43.9		Y
PW-115	75.0	18.0	0.0	18.0	60.0	12/14/2007	38.2	69.5	Y
W-60	101.0	23.0	8.0	31.0	79.0	12/13/2007	58.1	89.6	N
W-36	66.0	31.0	4.0	35.0	35.0	12/5/07	47.3	68.5	N
W-69	54.0	21.0	4.0	25.0	33.0	12/5/2007	36.6	52.2	N
PW-0041R(2)	78.0	15.0	3.0	18.0	55.0	12/12/2007	38.4	73.3	Y
W-34	77.0	34.0	4.0	38.0	43.0	12/5/2007	54.1	73.9	N
W-68	75.0	31.0	4.0	35.0	44.0	12/5/2007	51.8	60.0	N

depth to liquid table

Countywide RDF East Sparta, OH
Well Log Asbuilt Information
Report UpDated: 12-20-07

	Desing/As-Built Information					Dec. 2007 Readings			
Alias (Site plan designation)	Well Log Bore Depth	Solid Pipe Below Ground	Solid Pipe Stick-up Above Ground	Total Solid Pipe or Depth to Perforated Pipe (F+G+H)	Total Perforated Pipe	Date	Depth To Fluid	Depth To Bottom	Is there a pump in the well?
Id.	FT	FT	FT	FT	FT		FT	FT	
PW-104	75.0	15.0	3.0	18.0	60.0	12/14/2007	42.2	77.6	Y
V1	60.0	17.0	5.0	22.0	42.0	12/6/07	39.0	60.6	Y
W-57R(2)	80.0	20.0	4.0	24.0	59.0	12/13/2007	48.5	81.9	Y
PW-164	117.0	18.0	2.0	20.0	97.0	12/14/07	60.4	113.8	Y
C2R	120.0	20.0	4.0	24.0	99.0	12/14/2007	65.7	122.1	Y
PW-114	75.0	18.0	0.0	18.0	60.0	12/12/2007	44.1	77.5	Y
PW-61R	64.0	22.0	3.0	25.0	42.0	12/13/2007	43.3	63.6	Y
PW-302	32.0	10.0	5.0	35.0	22.0	12/6/2007	44.6	44.9	N
PW-153	50.0	18.0	2.0	20.0	32.0	12/7/2007	34.1	45.1	Y
PW-144	100.0	18.0	2.0	20.0	82.0	12/13/2007	56.5	96.4	Y
PW-122R	38.0	13.5	5.0	18.5	25.0	12/14/2007	29.7	36.4	Y
PW-112	75.0	18.0	0.0	18.0	59.0	12/13/2007	44.5	84.2	N
PW-57R	82.0	15.0	3.0	18.0	67.0	12/4/2007	48.3	79.5	Y
W-37	79.0	13.0	4.0	17.0	62.0	12/5/07	45.7	68.5	N
PW-157	109.0	20.0	3.0	23.0	89.0	12/13/2007	64.4		Y
PW-131	75.0	15.0	3.0	18.0	60.0	12/14/2007	46.0	46.0	N
W-12R	40.0	18.0	4.0	22.0	21.0	12/5/2007	31.9	41.1	N
PW-158	115.0	20.0	2.0	22.0	95.0	12/15/2007	67.3	110.3	Y
W-4	33.0	17.0	4.0	21.0	16.0	12/5/2007	28.7	36.4	N
W-7	29.0	15.0	9.0	24.0	14.0	12/5/2007	30.8	31.1	N
Total Number of Wells with Greater Than 50% of Design Perforations Blocked:					**71**				**41**
PW-162	100.0	20.0	2.0	22.0	80.0	12/13/2007	62.9	95.5	Y
PW-106R	65.0	20.0	4.0	24.0	45.0	12/12/2007	47.4		Y
PW-146	118.0	18.0	2.0	20.0	100.0	12/13/2007	72.1	114.6	Y
W-59	100.0	29.0	8.0	37.0	71.0	12/5/2007	74.3	101.1	N
PW-165	117.0	18.0	2.0	20.0	97.0	12/6/2007	72.3	121.4	Y
W-39	81.0	15.0	4.0	19.0	62.0	12/5/2007	52.5	78.0	N
E2R	120.0	20.0	4.0	24.0	99.0	12/13/2007	77.5	124.6	Y
PW-159	117.0	18.0	2.0	20.0	97.0	12/13/2007	73.2		Y
W-2R(M)	83.0	18.0	2.0	20.0	65.0	12/15/2007	56.0	76.4	N
PW-154	40.0	18.0	2.0	20.0	22.0	12/7/2007	32.2	42.8	Y
PW-129	118.0	15.0	3.0	18.0	103.0	12/6/2007	75.5	115.6	Y
PW-324	120.0	20.0	4.0	24.0	99.0	12/14/2007	81.1	121.3	N
PW-163	102.0	20.0	2.0	22.0	82.0	12/14/07	69.3	97.8	Y
PW-145	118.0	18.0	2.0	20.0	100.0	12/14/2007	78.9	118.0	Y
D2R	120.0	20.0	4.0	24.0	99.0	12/13/2007	83.1	124.6	Y
PW-124	60.0	15.0	3.0	18.0	45.0	12/3/2007	44.9	56.2	Y
PW-156	109.0	20.0	3.0	23.0	89.0	12/13/2007	76.9	109.6	Y
A2	64.0	18.0	5.0	23.0	45.0	12/6/2007	50.3	64.8	N
PW-103R	102.0	20.0	4.0	24.0	81.0	12/13/2007	73.7	103.4	N
PW-128	118.0	15.0	3.0	18.0	103.0	12/15/2007	81.7	115.2	Y
PW-169	79.0	40.0	6.0	46.0	15.0	12/13/2007	55.5	58.9	N
PW-155	38.0	18.0	2.0	20.0	22.0	12/7/2007	34.0	37.8	Y
PW-160	117.0	20.0	2.0	22.0	97.0	12/13/2007	84.0	113.2	Y
PW-130	118.0	15.0	3.0	18.0	103.0	12/6/2007	84.0	119.9	Y
PW-307	62.0	20.0	2.0	22.0	42.0	12/6/2007	49.5	61.7	N
PW-125	75.0	15.0	3.0	18.0	60.0	12/13/2007	57.5	77.3	Y
PW-330	120.0	20.0	4.0	24.0	99.0	12/5/2007	90.0	120.5	N
F2	65.0	20.0	4.0	24.0	44.0	12/6/2007	54.0	65.4	Y
PW-107	61.0	18.0	3.0	21.0	45.0	11/8/2007	52.0	61.7	Y

Countywide RDF East Sparta, OH
Well Log Asbuilt Information
Report UpDated: 12-20-07

	Desing/As-Built Information					Dec. 2007 Readings			
Alias (Site plan designation)	Well Log Bore Depth	Solid Pipe Below Ground	Solid Pipe Stick-up Above Ground	Total Solid Pipe or Depth to Perforated Pipe (F+G+H)	Total Perforated Pipe	Date	Depth To Fluid	Depth To Bottom	Is there a pump in the well?
Id.	FT	FT	FT	FT	FT		FT	FT	
PW-314	46.0	20.0	5.0	25.0	26.0	12/5/2007	43.5	51.6	N
PW-127	75.0	15.0	3.0	18.0	60.0	12/15/2007	61.2	75.9	Y
PW-310	69.0	20.0	5.0	41.0	49.0	12/13/2007	76.3	92.1	N
PW-329	112.0	20.0	4.0	24.0	91.0	12/5/2007	90.7	113.1	N
PW-101	75.0	15.0	3.0	18.0	60.0	12/15/2007	62.4	79.0	Y
PW-168(M)	88.0	19.0	6.0	25.0	68.0	12/15/2007	75.5	91.2	N
PW-161	115.0	20.0	2.0	22.0	95.0	12/14/07	93.2	115.7	Y
W-11	46.0	15.0	4.0	19.0	25.0	12/5/2007	38.0	39.6	N
E1	65.0	19.0	6.0	25.0	45.0	12/14/07	59.6	65.0	Y
F1-M	56.0	16.0	5.0	21.0	39.0	12/14/07	51.5	57.7	Y
PW-328	79.0	20.0	2.0	22.0	58.0	12/5/2007	70.9	82.9	N
PW-113	75.0	18.0	0.0	18.0	60.0	12/12/2007	71.8	90.0	N
Total Number of Wells w/ Less Than 50% of Design Perf's Blocked but Greater Than 5 Ft of Liquid in Well:					**41**				**25**
PW-110	29.0	18.0	0.0	18.0	13.0	12/5/2007	26.4	31.6	N
W-5	31.0	18.0	4.0	22.0	13.0	12/5/2007	31.1	34.7	N
W-3	29.0	17.0	4.0	21.0	12.0	12/13/2007	30.1	32.7	N
PW-109	35.0	18.0	0.0	18.0	19.0	12/5/2007	33.7	37.2	N
W-9	36.0	14.0	4.0	18.0	18.0	12/5/2007	33.9	36.6	N
PW-311	64.0	20.0	5.0	25.0	44.0	12/13/2007	64.1	73.9	N
PW-303	40.0	15.0	5.0	20.0	25.0	12/6/2007	42.6	42.6	N
PW-306	35.0	10.0	5.0	15.0	25.0	12/6/2007	37.7	40.0	N
PW-325	67.0	20.0	2.0	22.0	46.0	12/5/2007	64.2	71.3	N
W-33	52.0	14.0	4.0	18.0	34.0	12/5/2007	49.5	53.7	N
PW-312	63.0	20.0	5.0	25.0	43.0	12/5/2007	65.4	66.2	N
PW-326	117.0	20.0	4.0	24.0	96.0	12/5/2007	115.1	118.6	N
PW-331	117.0	20.0	4.0	34.0	96.0	12/5/2007	125.6	130.8	N
PW-150	48.0	18.0	2.0	20.0	30.0	12/7/2007	48.8	48.8	Y
PW-304	42.0	20.0	5.0	25.0	22.0	12/5/2007	46.2	48.1	N
W-35	64.0	14.0	4.0	18.0	46.0	12/5/2007	63.1	63.5	N
PW-305	59.0	20.0	5.0	25.0	39.0	12/6/2007	63.6	63.6	N
PW-170	37.0	18.0	4.0	22.0	18.0	12/13/2007	39.9	48.1	N
PW-111	60.0	18.0	0.0	18.0	44.0	12/5/2007	63.7	64.4	N
Total Number of Wells with Less Than 50% of Design Perf's Blocked and Less Than 5 FT of Liquid in Well:					**19**				**1**

ATTACHMENT B

BROCHURES FOR PUMPS

Vector Pneumatic Piston Pump®

Patented Top-Head-Drive Piston Pump

Model 101V

Patented, Repairable Vector Pneumatic Drive Motor

Flow Range
0-2 US GPM 7.6 CPM
Operational Depth
Up to 583 Ft. 215 M
Well Casing Size
Minimum 2 In. 4.85 CM

Description

The Vector Pneumatic Piston Pump Model 101V is powered by compressed air. The control motor is located at surface grade for easy installation and maintenance. Industrial-quality air pressure is used to power the pump motor. Power to the pump is direct from grade through the sucker rod assembly. The pump removes water and product (e.g. leachate) from a two (2) inch (4.85 cm) diameter well casing or greater to depths of 583 feet (215 meters). The fluid inlet is located at the bottom of the pump intake cylinder and removes water or product to 0 submergence depth.

Customizable Downhole Pump

Performance and Technical Data

Performance

Operational Depth	583'
Flow Range	0 to 2 US GPM/ 7.6 LPM 2,880 US GPD/ 10,900 LPD
Discharge per Stroke	.05 US Gallons per stroke (.19 liters per stroke) Note: flow does not vary with depth
Strokes per Minute	5 - 40
Maximum Operating Pressures	250 psig (operating pressure based on 120 psi air supply)
Maximum Lift	583 feet of water or 250 psig
Maximum Strokes Per Minute	40 (Variable speed (stroke) control adjusts to well conditions; liquid drawn down to top of strainer.)

Technical

Stroke Length	12" (30.48 cm)
Maximum External Diameter	2.9" (7.37 cm)
Total Cylinder Length	30" (76.2 cm)
Connection of Riser Pipe	2" (4.85 cm)
Connection to Sucker Rod	7/16" - 20
Recommended Internal Diameter of Bore Hole	3-4" (7.62 cm -10.16 cm) or greater diameter
Weight of Cylinder	8 lbs.
Discharge Size	2" NPT
Installation	Unit can be installed vertically or horizontally
Driver Weight	5 lbs.
Driver Rod Weight	12 lbs./100'
Foot Valve Assembly Weight	8 lbs.
Minimum Well Casing Size	3"
Pneumatic Air Connection	3/8" NPT 3/8" OD Tubing

* Up to 1000 feet.

Vector Pneumatic Piston Pump®

Model 101V

Materials of Construction:

(Materials of construction can be modified to meet specific applications)

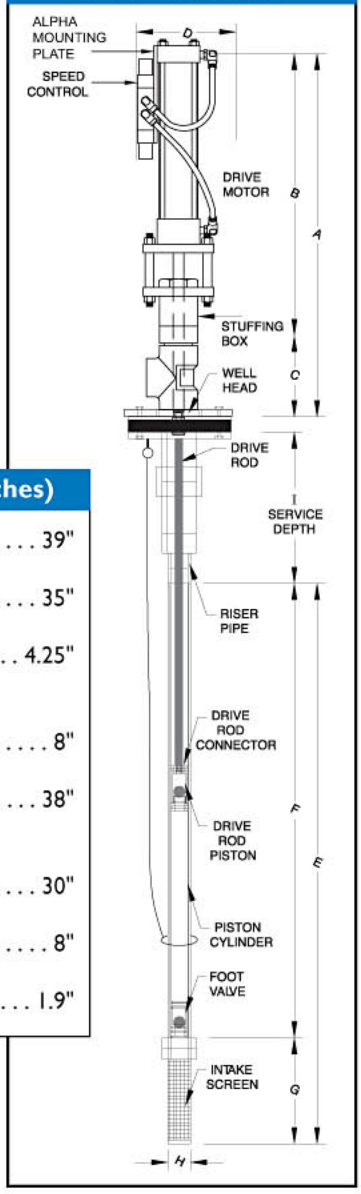
Above Ground

Drive Motor	Stainless Steel/ Aluminum
Stuffing Box Seal	Nitrile/Viton
Stuffing Box	Delrin®
Discharge Tee	Stainless Steel
Well Head	PVC/ABS

Downhole

Drive Rod	Fiberglass
Drive Rod Connector	Stainless Steel
Drive Piston Seal	Nitrile/Viton
Drive Piston Check Ball	Stainless Steel
Drive Piston	Delrin®
Piston Cylinder	Stainless Steel/PVC
Foot Valve Check Ball	Stainless Steel
Foot Valve	Delrin® with Stainless seat
Intake Screen	Stainless Steel/PVC

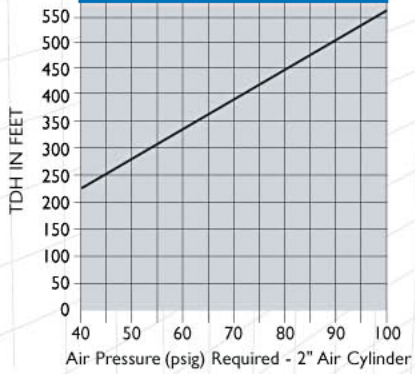
Pump Dimensions



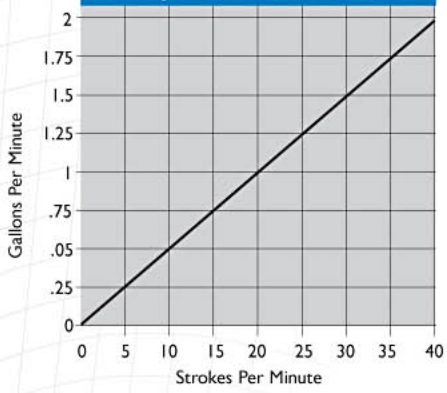
Dimensions (in inches)

- **A** Above Well Height . . . . . 39"
- **B** Driver Height . . . . . 35"
- **C** Discharge Tee & Well Seal Height . . . . . 4.25"
- **D** Driver Diameter . . . . . 8"
- **E** Foot Valve Assembly Length . . . . . 38"
- **F** Foot Valve Length . . . . . 30"
- **G** Intake Screen Length . . . . . 8"
- **H** Downhole Diameter . . . . 1.9"

Vector 101V Pneumatic Motor Air Pressure Requirements



Vector 101V Pneumatic Pump Flow Performance



* Up to 1000 feet.

AP4B

AutoPump®

Bottom Inlet, Short

Max. Flow	**13 gpm (49 lpm)**
O.D.	**3.5 in (8.9 cm)**
Length	**41 in. (104 cm)**

Description

The AP4 Bottom Inlet Short AutoPump provides maximum capabilities and flow in a bottom inlet pump for 4" (100 mm) diameter and larger wells with shorter water columns and/or the need to pump down to lower water levels, compared to full-length pumps. It is offered in optional versions to handle even the most severe remediation and landfill pumping applications, and delivers flow rates up to 13 gpm (49 lpm)*. The AP4 Short Bottom Inlet AutoPump is complemented by the most comprehensive selection of accessories to provide a complete system to meet site specific requirements. Call QED for prompt, no-obligation assistance on your pumping project needs.

The AutoPump Heritage

The AP4 Bottom Inlet Short AutoPump is part of the famous AutoPump family of original automatic air-powered pumps, developed in the mid 1980s specifically to handle unique pumping needs at remediation and landfill sites. Over the years they've proven their durability at thousands of sites worldwide. AutoPumps are designed to handle difficult pumping challenges that other pumps can't, such as hydrocarbons, solvents, suspended solids, corrosives, temperature extremes, viscous fluids and frequent start/stop cycles. Beyond just the pump, AutoPump systems offer the most complete range of tubing, hose, connectors, wellhead caps and accessories to help your installation go smoothly. This superior pumping heritage, application experience and support back up every AutoPump you put to work on your project.

Advantages

1. **The original automatic air-powered well pump, proven worldwide over 18 years**
2. **The highest flow rates and deepest pumping capabilities in the industry**
3. **Patented, proven design for superior reliability and durability, even in severe applications**
4. **Handles solids, solvents, hydrocarbons corrosive conditions, viscous fluids and high temperatures beyond the limits of electric pumps**
5. **Five-year warranty**

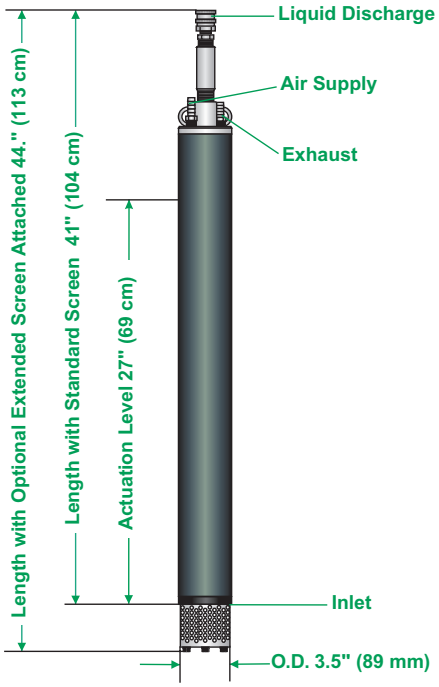
***Consult QED for higher flow requirements**

AutoPump®

Bottom Inlet, Short

AP4B

Pump Dimensions



Specifications & Operating Requirements

Model	**4" - Short AP4 Bottom Inlet**
Liquid Inlet Location	Bottom
OD	3.5 in. (8.9 cm)
Length Overall (pump & fittings)	41 in. (104 cm)
Length Overall, w / Extended Screen	44 in. (112 cm)
Weight	13 lbs. (5.9 kg)
Max. Flow Rate	13 gpm (49 lpm)* - See Flow Rate Chart
Pump Volume / Cycle	0.22 - 0.36 gal (.83 - 1.36L)
Min. Actuation Level	27 in. (69 cm)
Standard Pump	
Max. Depth	250 ft. (76 m)
Air Pressure Range	5 - 120 psi (0.4 - 8.4 kg/cm2)
Air Usage	0.4-1.5 scf / gal. (1.5 - 5.7 liter of air / fluid liter) - See air usage chart
High Pressure Pump	
Max. Depth	425 ft. (130 m)
Air Pressure Range	5 - 200 psi (0.4 - 14.1 kg/cm2)
Min. Liquid Density	0.7 SpG (0.7 g/cm3)
Standard Construction Materials[1]	
Pump Body	Fiberglass or Stainless Steel
Pump Ends	Stainless Steel, UHMWPE[3], Brass
Internal Components	Stainless Steel, Viton, Acetal, PVDF[4]
Tube & Hose Fittings	Brass or Stainless Steel
Fitting Type	Barbs or Quick Connects
Tube & Hose Options	
Tubing Material[2]	Nylon
Sizes - Liquid Discharge	1 in. (25 mm) or 1-1/4 in. (32 mm) OD
Pump Air Supply	1/2 in. (13 mm) OD
Air Exhaust	5/8 in. (16 mm) OD
Hose Material	Nitrile
Sizes - Liquid Discharge	3/4 in. (19 mm) or 1 in. (25 mm) ID
Pump Air Supply	3/8 in. (9.5 mm) ID
Air Exhaust	1/2 in. (13 mm) ID

[1] Material upgrades available
[2] Applies to QED supplied tubing; other tubing sources may not conform to QED fittings.
[3] UHMWPE - Ultra High Molecular Weight Polyethylene
[4] PVDF - Polyvinylidene Fluoride

Application Limits (Base model)

AP4 AutoPumps are designed to handle the application ranges described below. For applications outside these ranges, consult QED about AP4 upgrades.

Maximum Temperature: 150°F (65°C)
pH Range: 4-9
Solvents and Fuels: diesel, gasoline, JP1-JP6, #2 heating oils, BTEX, MTBE, landfill liquids

***Consult QED for higher flow requirements**

Long and short AP-4 AutoPumps are warranted for five (5) years: 100% materials and workmanship first three (3) years; 50% materials and workmanship for the fourth (4th) and fifth (5th) years.

Low-Drawdown for the AutoPumps are warranted for one (1) year.

P.O. Box 3726 Ann Arbor, MI 48106-3726 USA **1.800.624.2026** **F 1.734.995.1170** info@qedenv.com www.qedenv.com

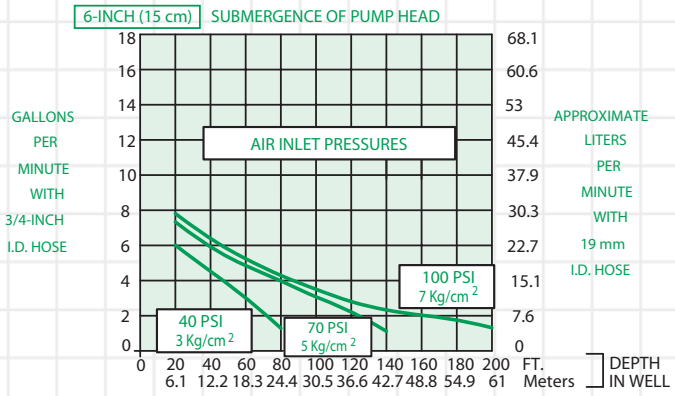
AP4B

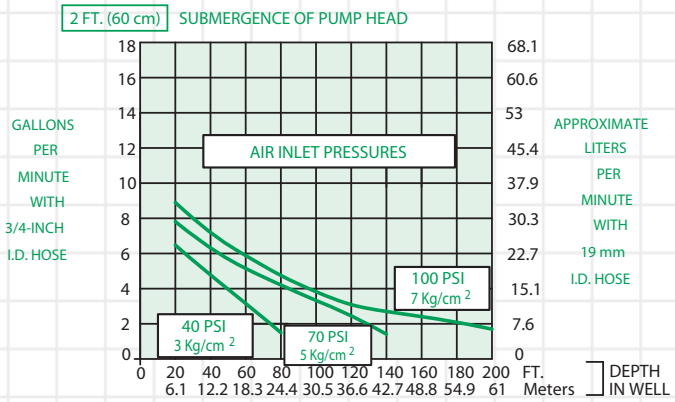
AutoPump®

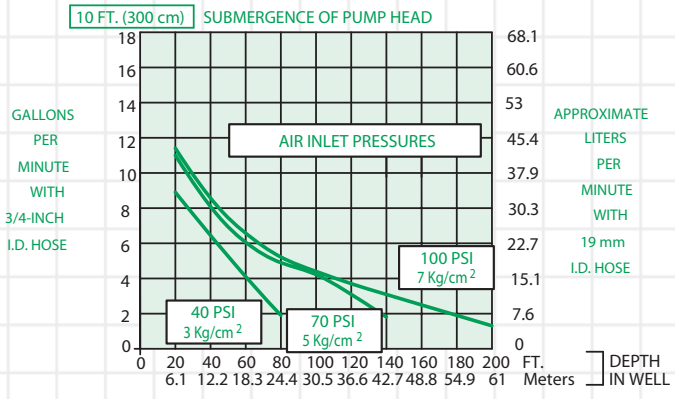
Bottom Inlet, Short

Flow Rates[1]

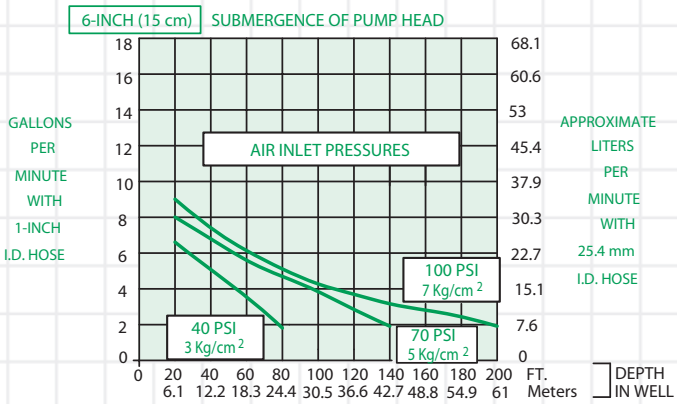
3/4 inch (19 mm) Inside Diameter Discharge Hose
(Equivalent to 1-Inch O.D. Tubing)

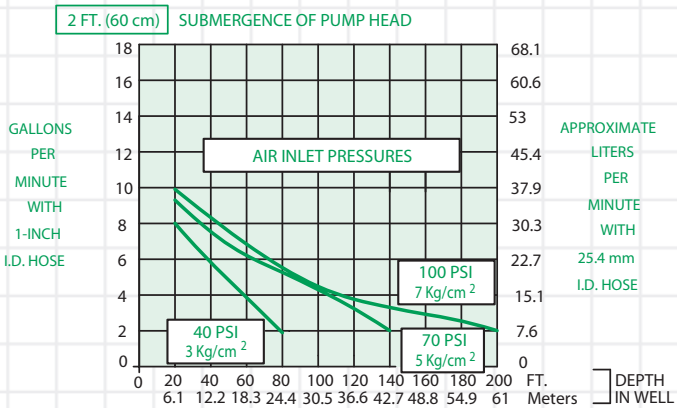


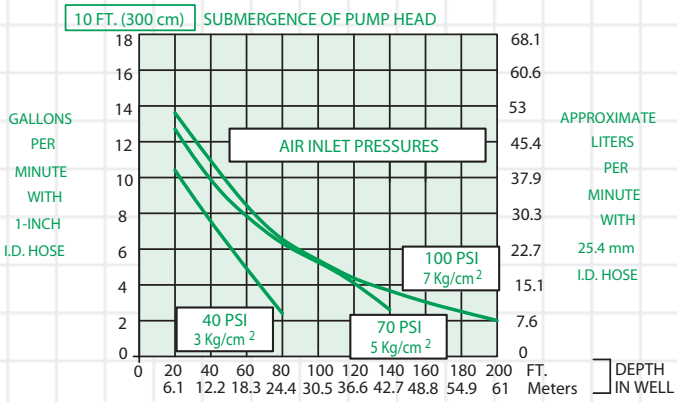




1 inch (25.4 mm) Inside Diameter Discharge Hose
(Equivilant to 1.25-Inch O.D. Tubing)







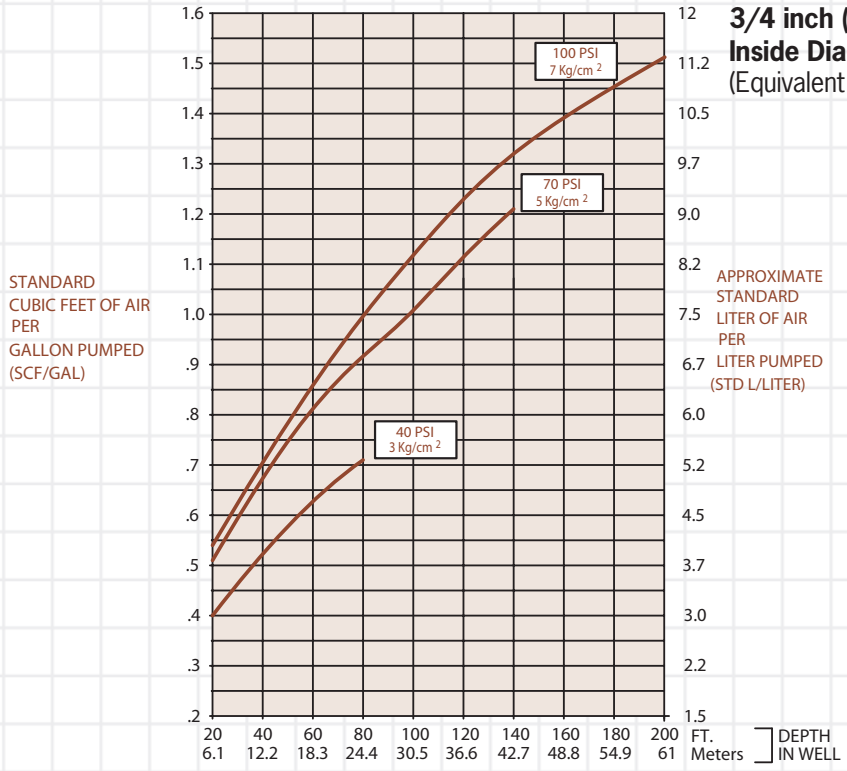
[1]FLOW RATES MAY VARY WITH SITE CONDITIONS. CALL QED FOR TECHNICAL ASSISTANCE.

AutoPump®

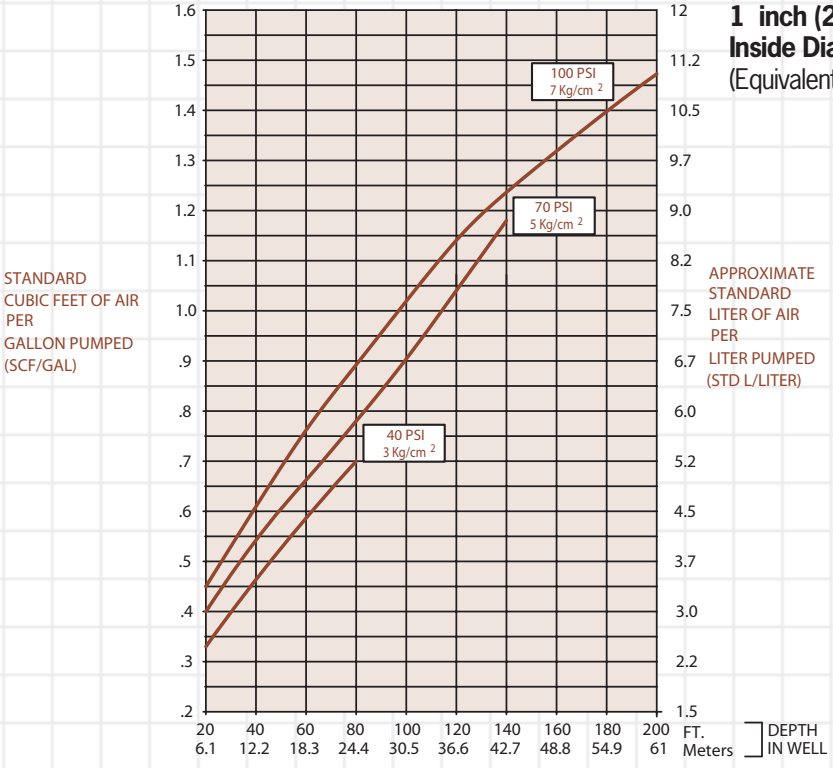
Bottom Inlet, Short

AP4B

Air Consumption



3/4 inch (19 mm)
Inside Diameter Discharge Hose
(Equivalent to 1-Inch O.D. Tubing)



1 inch (25.4 mm)
Inside Diameter Discharge Hose
(Equivalent to 1.25-Inch O.D. Tubing)

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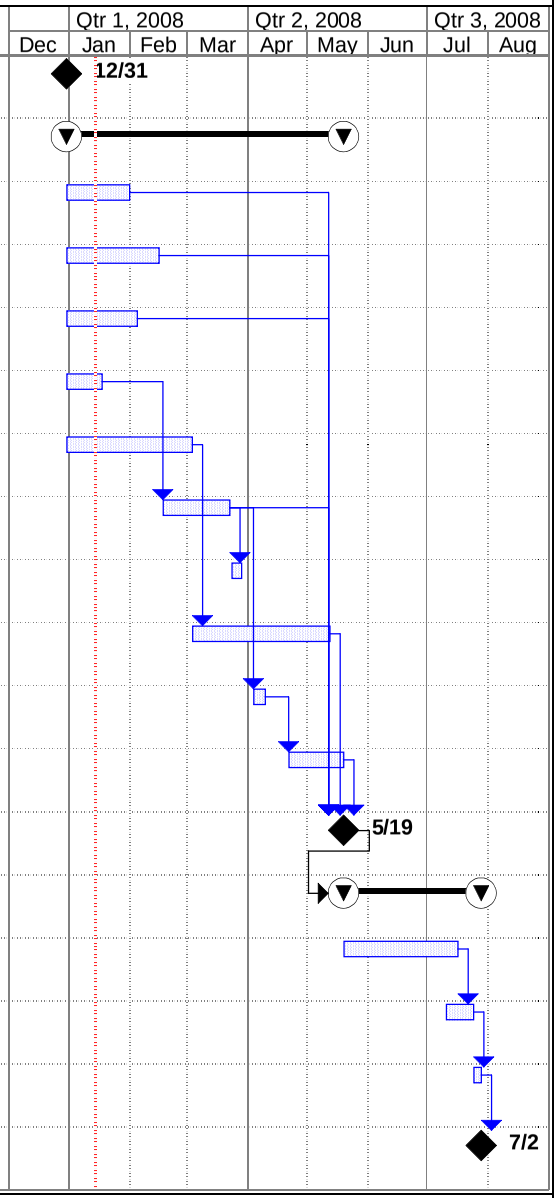
ATTACHMENT C

SCHEDULE

ATTACHMENT C
Estimated Construction Schedule For Dewatering and EGEW Enhancements
Revised: 01/14/08

ID	Task Name	Dur.	Start	Finish
1	Complete Addendum to Nov. 7, 2007 Orders	0 d	Mon 12/31/07	Mon 12/31/07
2	**Design and Installation of Dewatering and EGEW Enhancments**	**120 d**	**Mon 12/31/07**	**Mon 5/19/08**
3	Install and Test Two New Air Compressors	27 d	Mon 12/31/07	Thu 1/31/08
4	Install Additional Dewatering Pumps and Assoc. Infrastruct. (44 pumps)	40 d	Mon 12/31/07	Fri 2/15/08
5	Install Gas Flow Metering Devices on Existing EGEWs	30 d	Mon 12/31/07	Mon 2/4/08
6	Design EGES Enhancements, New and Replacement EGEWs (23 EGEWs)	15 d	Mon 12/31/07	Thu 1/17/08
7	Design EGES Enhancements, Flare Relocations and Header Upgrades	54 d	Mon 12/31/07	Mon 3/3/08
8	Install EGES Enhancements, New and Replacement EGEWs (23 total)	30 d	Mon 2/18/08	Sat 3/22/08
9	Install Gas Flow Metering Devices on New and Replacement EGEWs	5 d	Mon 3/24/08	Fri 3/28/08
10	Install EGES Enhancements, Flare Relocations and Header Upgrades	10 wks	Tue 3/4/08	Mon 5/12/08
11	Evaluate New and Replacement EGEWs for Potential Dedicated Pump Install.	5 d	Fri 4/4/08	Wed 4/9/08
12	Install Add. Dewat. Pumps and Infrastruct. in New EGEWs (est. 15 pumps)	4 wks	Tue 4/22/08	Mon 5/19/08
13	Substantial Completion of Dewatering and EGES Enhancements	0 d	Mon 5/19/08	Mon 5/19/08
14	**Baseline Flow**	**58 d**	**Tue 5/20/08**	**Mon 7/28/08**
15	Conduct Pump Run Tests for Achiev. Drawdown for EGEWs in Priority Area	8 wks	Tue 5/20/08	Wed 7/16/08
16	Obtain Liquid Levels To Confirm Baseline Conditions in Priority Area	2 wks	Fri 7/11/08	Thu 7/24/08
17	Take Flow Readings Across Site	3 d	Fri 7/25/08	Mon 7/28/08
18	Baseline Flow Reading Established	0 d	Mon 7/28/08	Mon 7/28/08



Date: Mon 1/14/08

Task
Progress
Summary
Split
Milestone
Deadline

final schedule 01-14-08

Note: Work and schedules may be modified per the provisions of Section XII of the December 31, 2007 F&Os.

ATTACHMENT D

EGEWs OUTSIDE THE PRIORITY AREA

"Appendix A" from OEPA December 31, 2007 Orders
EGEWs Temporarily Excluded From the Scope of These Orders

Item No.	EGEWs North of 25,000 (Alias Well ID)
1	PW 301
2	PW 302
3	PW 303
4	PW 304
5	PW 305
6	PW 306
7	PW 308
8	PW 309
9	PW 310
10	PW 311
11	PW 312
12	PW 313
13	PW 314
14	PW 325
15	PW 326
16	PW 330
17	PW 331
18	PW 325
19	PW 328

Item No.	EGEWs With Stingers (Alias Well ID)
1	P 1
2	Y 1
3	Z 1
4	H 1
5	I 1
6	J1-M
7	U 1
8	Q 1
9	W 56 RM

Item No.	EGEWs East of Haul Road (Alias Well ID)
1	W 2 (Abandoned)
2	W 2R(M)
3	W 3
4	W 32
5	W 58
6	W 58R
7	PW 168 (M)
8	PW 12R
9	W 12 (Abandoned)
10	W 13 (Abandoned)
11	W 4
12	W 5
13	W 6
14	W 7
15	W 8
16	W 9
17	PW 110
18	W 10
19	W 33
20	W 35
21	W 36
22	W 37
23	W 68
24	PW 109
25	W 38
26	W 34
27	PW 112
28	W 60
29	PW 111
30	W 11
31	W 39
32	W 69
33	PW 169
34	W 59

Item No.	Remote EGEWs (Alias Well ID)
1	N 1
2	T 1
3	PW 133
4	PW 134
5	PW 135
6	PW 136
7	PW 137
8	PW 138
9	PW 143
10	W 10 (E. Of Haul Rd)
11	B 1
12	PW 301 (N. of 25,000)
13	W 6 (E. of Haul Road)