

### **Introduction**

The Leach-Rite Dispersal System installed in your landfill is a unique system for dispersing leachate back into the landfill. The system incorporates filtration, automatically timed and level controlled, and ultra low rate dispersal distribution.

The Leach-Rite system is composed of five major components. Three of them are located at or near the holding pond and/or storage tank, and the remaining two are located at the cell where the leachate is being dispersed.

#### **Storage Tank / Holding Pond Components:**

1. Stainless Steel Submersible Pump with Pressure Transducer
2. Hydraulic Unit with Flow Meter
3. System Control Panel

#### **Cell Dispersal Components:**

4. Zone Solenoid Manifold
5. Dispersal Tubing

All components of the system are brought together by the control panel which communicates and powers the hydraulic unit and the zone solenoid manifold via low 24 volt DC wires, provides and monitors supply power to the pump, and communicates and displays the level in the holding pond and/or storage tank being measured by the submersible pressure transducer.

### **Operation Summary**

The system is capable of operating in (3) three modes, each with (2) two different dose modes.

#### **Operation Mode**

- Full Automatic Mode
- Operator Specified Automatic Mode
- Manual / Test Mode

#### **Dosing Mode**

- Standard Mode
- Peak Mode

*Note: It is recommended that the system only be run in "Test Mode" by authorized personnel or under the direct supervision of Leachator Pumping Systems, Inc.*

Standard design of the system is to operate in "**Full Automatic Mode**" which requires an input signal from the level sensor(s) to enable the system to dose, and depending on the input signal (level measured in the holding pond / storage tank) determines whether the system will dose in a "**standard mode**" (the everyday dispersal rate the system was designed for) or a "**peak mode**" (allows the system to increase the amount being dispersed due to increased amounts of leachate). However, the dosing can be specified by the operator, "**Operator Specified Automatic Mode**", which will override the input signal from the level sensor(s). Once the signal has been received, a cycle will initiate, activating the pump and opening the appropriate valves for backflushing the filters on the hydraulic unit. Upon completion of the backflushing, all system supply valves, master valve and appropriate zone valves will open and remain open for the duration of the dose as set for in

# LEACHATOR

“standard” or “peak” mode. After the dosing time has elapsed, the pump(s) will shut off and all valves will close. The system will remain off until the pre-programmed off time expires. Once the off timer expires, the system activates another cycle and dosing of the next zones. This process will continue until the leachate level drops below a pre-set off point or the system is shut-down manually.

## **Component Specifications**

### **Dispersal Tubing**

The dispersal field supply line conveys the leachate to the dispersal absorption zone that is being dosed, where it is discharge below the surface through a patented chemical-resisting pressure compensating self cleaning “dispersal” poly-tubing emitter. The emitters are located every two feet in the tubing and emit 0.65 gallons per hour per emitter.

The dispersal lines are automatically scoured (forward flushed) every 50 dosing cycles. This function is activated by the controller, which opens a field flush valve, thus allowing the flushed leachate to be returned to the landfill. The duration of this cycle is approximately three minutes. The flushing cycle produces a high velocity cleansing/scouring action by the leachate along the inside walls of the emitter tubing, PVC manifolds and emitters.

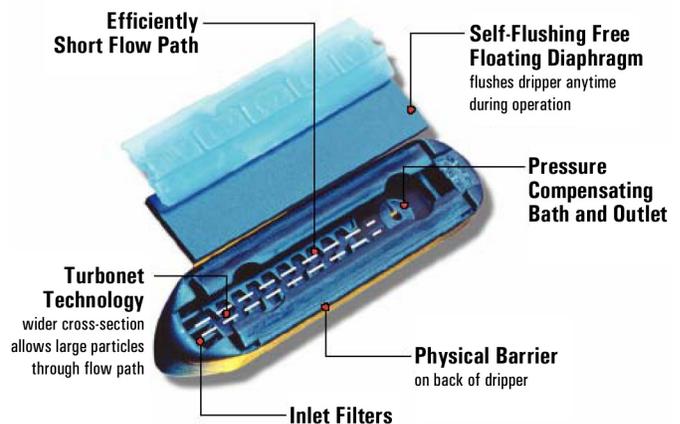
The construction of the “RAM” dispersal tubing is unique in that the internal diaphragm and labyrinth provide for an exact amount of leachate to be discharge from each of its emitters which are spaced two foot intervals along the entire length of the RAM dispersal tubing.

### **Air Release Valves**

The dispersal field return line conveys the leachate from the dispersal absorption zone (used to “flush” or clean the tubing) back to the landfill. Each zone will have an air release valve housed in a small valve box at the highest point of the return manifold pipe in each zone. The valve will close when the leachate pressure arrives at the valve during each dose. The air valve allows air to reenter the tubing after each dose to allow the tubing to drain. This also prevents the uphill tubing from draining leachate into the downhill tubing and overloading downhill tubing. In the event of damage to the air release valve, leachate may leak from the system. This condition should be fixed immediately by replacing damaged

parts. Air release valves should not be covered with soil or other material and should always be accessible.

Each emitter maintains a constant flow over a pressure range of 7 to 70 psi. Because the leachate is distributed at an ultra low rate, large quantities of leachate may be economically distributed over a large area during controlled periods of time without saturating.



## **Disc Filters**

Disc filters shall be an oblique filter, entirely of plastic, with male end connections to NPT Sch80 pipe. The filter elements shall consist of grooved rings, mounted on a spine forming a cylindrical filter body. The rings are to be kept together by a spring seated at the bottom of the filter cover. The out-in filter shall be screw in type with O-ring seal. The body materials shall be polyester, the spine shall be stainless steel. The nominal filtration capacity of the filter shall be 115 microns.



## **Automatic Control Valves**

The automatic control valves shall be solenoid activated diaphragm valves. The body and cover shall be reinforced nylon. The metal parts shall be stainless steel, the diaphragm shall be nylon-fabric reinforced poly isoprene. Valves shall operate electrically using electric pulse to open and close.



## **Control Panel**

The "state of the art" control panel is UL Listed 698A and is enclosed in outdoor corrosion resistant enclosure connected to the hydraulic unit and the remote zone solenoid manifold. The control panel use single or three phase power and the microprocessor has 120V and 24V AC inputs and 24V DC outputs for automatic operation of the remote zone solenoid valves.



## **Hydraulic Unit**

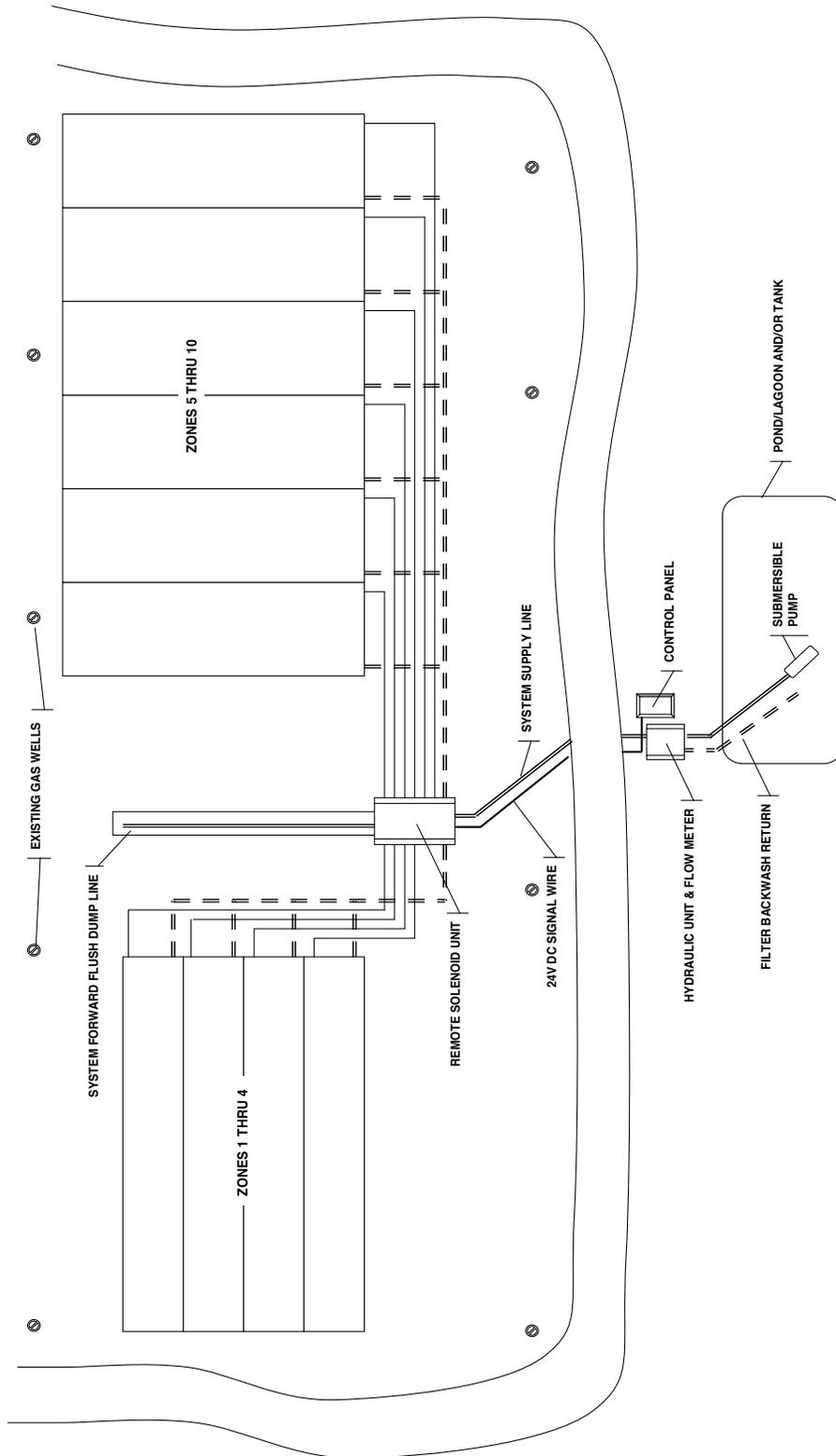
Consists of automatic control valves, disc filters and flow meter, and is typically located near the source of leachate that is to be re-introduced back to the landfill. Leachate is distributed through each filter during dosing. The filter are cleaned by means of scheduled backflushing the beginning of each dose cycle. One flow system valve opens and one filter backwash valves opens allowing leachate flow to the hydraulic unit, but forcing it back through the disc filter and discharging accumulated impurities back to the source of leachate. The closing and opening procedure of the flow system valves and the filter backwash valves causes a change of flow within the unit to provide filtered leachate from one filter to back flush the other filter. The backflush procedure last approximately fifteen to twenty seconds then the backflushing valves close. Leachate will be delivered through clean filters, through the flow meter and finally through the remote discharge manifold and out to the designated zone.

## **Remote Solenoid Manifold**

Consisting of automatic control valves, is typically located in or in-between the cells where the leachate will be re-introduced. Individual solenoid valves are opened and closed by DC pulses sent from the control panel.



## System Layout Drawing



## \*Benefits of Leachate Recirculation

- Enhances bio-reaction of the landfill cell mass
- Increases landfill gas production
- Reduces organic content of leachate
- Shortens landfill post-closure maintenance time

*\*Source: Sanitary Landfill Leachate - Generation, Control and Treatment. Syed R. Qasim, Walter Hang*

## Cost Savings of Leachate Recirculation

- Eliminates repetitious re-pumping of leachate
- Eliminates trucking of leachate for treatment
- Eliminates expenses of wastewater treatment of leachate
- Reclaims airspace

## Rapid Return on Investment

- Typical payback in only 3 to 6 months
  - Cost of leachate trucking and per gallon
  - Number of gallons per day
- Calculate your savings
  - Assume trucking / treatment cost of \$0.08/gallon
  - Assume 6000 gallons per day standard dose
  - $\$0.08 \times 6000 \text{ gallons} \times 365 \text{ days} = \$175,200$
  - Average system cost = \$50,000 to \$75,000
  - Payback in 4 months

### Fauquier County Landfill (Warrenton, Virginia)

