LEACHATE MANAGEMENT PLAN
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

Presented to:

Hillsborough County
Department of Solid Waste
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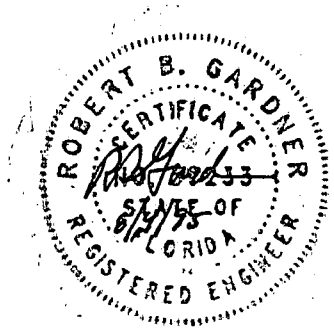

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OBJECTIVE

This report presents the leachate management system plan for the Hillsborough County Southeast Landfill (SELF). The objective of the leachate management plan is to remove leachate as it is conveyed to the collection points within the SELF, and not exceed the maximum storage calculated for the SELF using the U.S. Environmental Protection Agency's (U.S. EPA) Hydrological Evaluation of Landfill Performance (HELP) model. This Leachate Management Plan (LMP) replaces Sections 3.3 and 3.4 of the 1994 Operation Permit Renewal Application Engineering Report for the SELF. The SELF leachate management system includes the following major components and disposal methods:

- Leachate collection and removal system (LCRS).
- Collection point, Temporary Pump Station No. 3 (TPS-3) and Temporary Pump Station No. 5 (TPS-5).
- Leachate storage tank (500,000 gallons).
- Leachate treatment and reclamation facility (LTRF).
- Disposal methods.
  - Effluent spray irrigation system.
  - Tanker trucks hauling to off-site treatment facilities.
  - Truck mounted spray recirculation.

A leachate management system schematic is shown on Figure 1.

LEACHATE MANAGEMENT SYSTEM COMPONENTS

Existing Leachate Generation

Dry and wet conditions were simulated using the HELP model. The results from the HELP model showed estimated monthly averages of spray irrigation, hauling, and storage for a dry

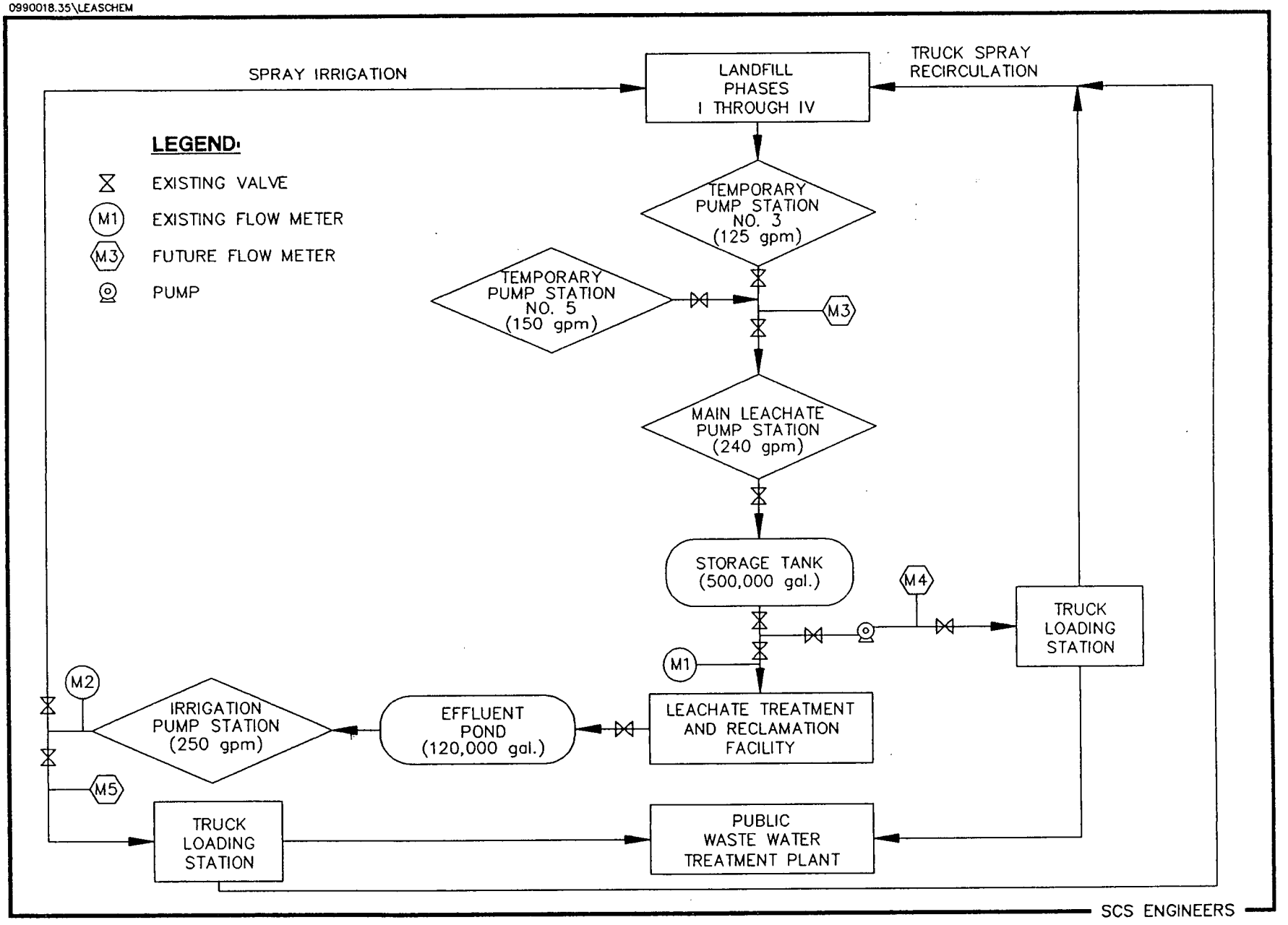

Figure 1. Leachate Management System Schematic.

year, wet year, and the year which showed the maximum leachate generation. Table 1 lists the characteristics of the SELF's cover configurations and the leachate generation estimates based on each configuration. Water balance calculations were performed on the various configurations which currently comprise the SELF, including sideslopes with a final capping system, intermediately capped Phases I through IV, and an active cell. The results from the HELP model are summarized in Table 2, which shows estimated monthly averages of spray irrigation, hauling, and storage for a dry year, wet year, and the fourth year which showed the maximum leachate generation. Table 2 is to be used as a planning tool for estimating leachate/effluent off-site hauling projections.

The water balance calculations indicate the SELF will have a maximum leachate depth of 2.5 feet over the liner during the modeled year that showed the highest leachate generation, as shown on Figure 2. Figure 2, will be used as a planning tool for estimating leachate depth over the liner. Although Figure 2 was used to establish the maximum depth over the liner of 2.5 feet, the leachate depth measured in the Phase IV piezometer will currently be utilized for estimating the depth of leachate over the liner. Figure 2 will be used to compare the projected hydrograph versus actual monitored leachate depths as landfilling operations progress. The system will be managed so that the actual depth of leachate is maintained at or below the values shown in the projected hydrograph.

The maximum depth of 2.5 feet corresponds to a calculated maximum storage of approximately 1.9 million gallons as shown on Figure 3. Storage calculations are based on the estimated top of phosphatic clay contours obtained from the 1994 Geotechnical investigation by Ardaman and Associates, Inc. (Ardaman), additional data from a field survey dated February 22, 1995 and piezometric data dated July 5, 1995. As the top of phosphatic clay settles, leachate storage in the SELF will change. The approximate top of clay elevations at the monitoring points will be maintained on site and will be reported to FDEP and EPC on a quarterly basis. Figure 3 will be adjusted annually to reflect the most accurate representation of leachate storage in the landfill. The top of clay settlement will be monitored at the existing temporary sumps No. 3 and No. 4. In addition, two temporary settling plates will be installed at the locations shown on Figure 4. The design layout of the leachate collection system is shown on Figure 4. The design detail for the proposed settling plates is shown in Figure 5.

TABLE 1. ESTIMATED LEACHATE GENERATION
SOUTHEAST COUNTY LANDFILL

Landfill Phases	Area (ac)	Grass Cover	Soil Cover Type	Waste Height (ft)	Average Leachate Generation Rate	
					(gpd)	(g/d/a)
Intermediately Capped Phases: Spray Irrigation	23.0	Fair	18-inch Intermediate Cover	40	35,600	1,500
Intermediately Capped Phases: No Spray Irrigation	69.2	Fair	18-inch Intermediate Cover	40	29,400	420
Capped Sideslopes (Phases I, II, & III)	23.2	Fair	18-inch Clay Cap	8	7,900	340
Active Cell (Leachate Recirc.)	5.0	Bare	6-inch Daily Cover	10	9,400	1,900
Totals	120.4				82,300	680

Notes: (1) Model assumes steady state condition of current conditions.
(2) Model includes subsurface flow from compressed clays estimated at 50 gal/day/ac.
(3) Model includes spray irrigation of 60,000 gpd as per specific conditions.
(4) Model includes average leachate recirculation rate of 12,200 gpd.
(5) No runoff occurs from the active cells.

TABLE 2. PROJECTED LEACHATE WATER BALANCE FOR WET AND DRY YEARS WITH SPRAY IRRIGATION
SOUTHEAST COUNTY LANDFILL, HILLSBOROUGH COUNTY, FLORIDA

Year	Collected (gal)	Sprayed & Recirc. (gal)	Vol. trucked off-site (gal)	Change in Storage (gal)	Net Storage (gal)
1st Year - Dry year					
January	2,107,000	2,051,000	0	56,000	56,000
February	2,010,000	1,708,000	108,000	194,000	250,000
March	2,197,000	2,206,000	0	(9,000)	241,000
April	2,089,000	2,266,000	0	(177,000)	64,000
May	2,098,000	2,206,000	0	(108,000)	0
June	2,006,000	1,742,000	14,000	250,000	250,000
July	2,041,000	824,000	1,217,000	0	250,000
August	2,024,000	1,073,000	951,000	0	250,000
September	1,870,000	1,511,000	359,000	0	250,000
October	1,891,000	1,682,000	209,000	0	250,000
November	1,803,000	2,318,000	0	(515,000)	0
December	1,762,000	1,382,000	130,000	250,000	250,000
2nd Year - Wet year					
January	1,870,000	1,691,000	179,000	0	250,000
February	1,664,000	1,545,000	119,000	0	250,000
March	1,797,000	1,966,000	0	(169,000)	81,000
April	1,774,000	1,914,000	0	(140,000)	0
May	1,889,000	2,086,000	0	(197,000)	0
June	1,957,000	893,000	814,000	250,000	250,000
July	2,287,000	867,000	1,420,000	0	250,000
August	2,262,000	1,485,000	777,000	0	250,000
September	2,298,000	1,545,000	753,000	0	250,000
October	2,697,000	1,580,000	1,117,000	0	250,000
November	2,675,000	1,974,000	701,000	0	250,000
December	2,846,000	1,966,000	880,000	0	250,000
4th Year - Max. leachate generated					
January	3,018,000	2,197,000	821,000	0	250,000
February	2,760,000	1,305,000	1,455,000	0	250,000
March	2,742,000	2,051,000	691,000	0	250,000
April	2,529,000	2,069,000	460,000	0	250,000
May	2,672,000	1,837,000	835,000	0	250,000
June	2,720,000	911,000	1,809,000	0	250,000
July	2,965,000	884,000	2,081,000	0	250,000
August	3,193,000	859,000	2,334,000	0	250,000
September	3,218,000	1,640,000	1,578,000	0	250,000
October	3,184,000	1,613,000	1,571,000	0	250,000
November	3,021,000	2,163,000	858,000	0	250,000
December	3,012,000	1,931,000	1,081,000	0	250,000

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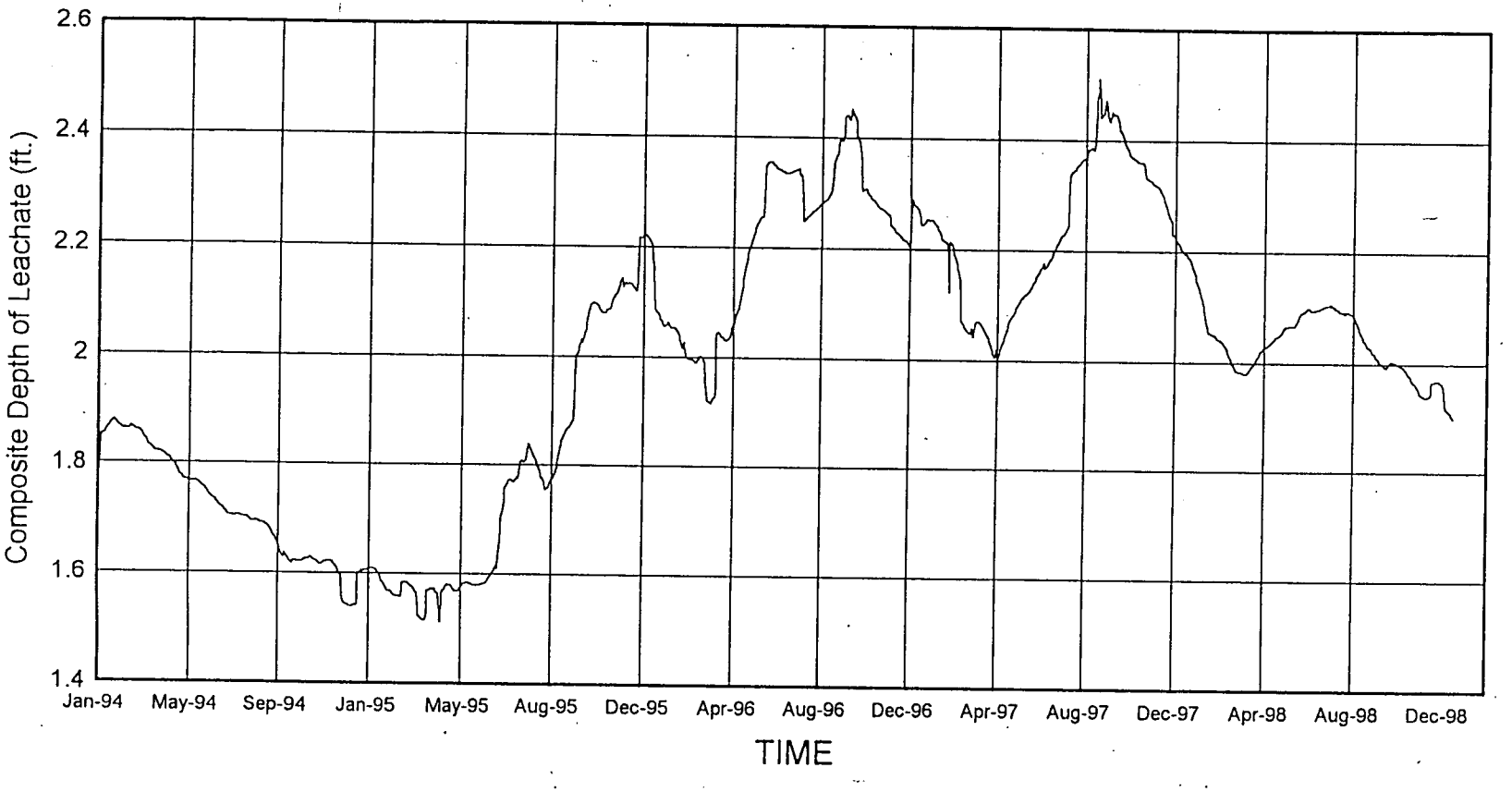

1. STEADY STATE COMPOSITE HYDROGRAPH INCLUDES SPRAY IRRIGATION APPLICATION OF 60,000 gpd AND AVERAGE EFFLUENT RECIRCULATION OF 12,200 gpd.
2. DRAINAGE LAYER=0.005 cm/s AND WASTE LAYER=0.0001 cm/s. PEAK DEPTH=2.51 FT. AVERAGE DEPTH=1.99 FT.

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Figure 2. Five Year Hydrograph—Composite Depth Above Liner, Southeast Landfill, Hillsborough County, Florida.

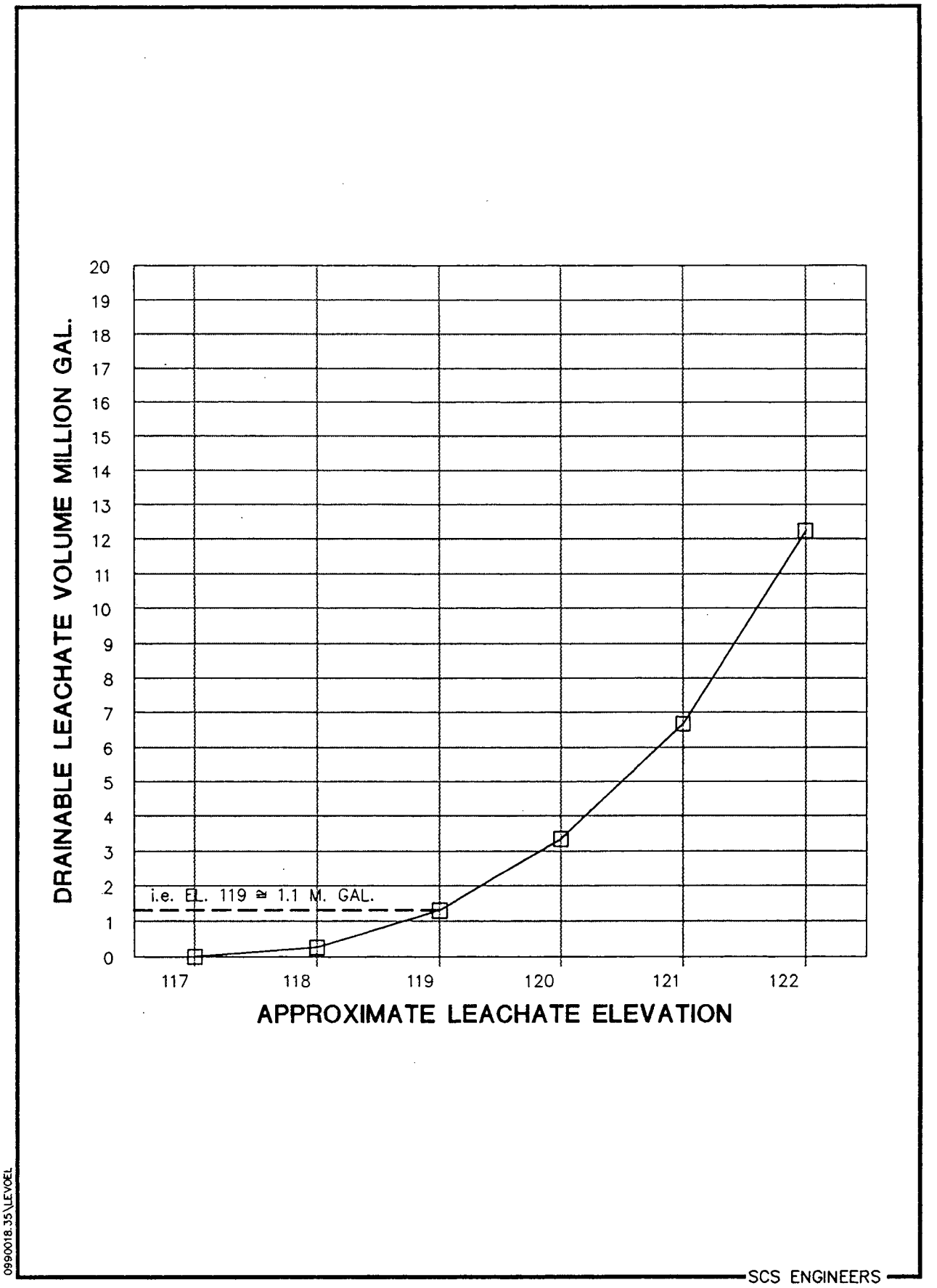


Figure 3. Leachate Volume Vs. Elevation, Southeast Landfill, Hillsborough County.

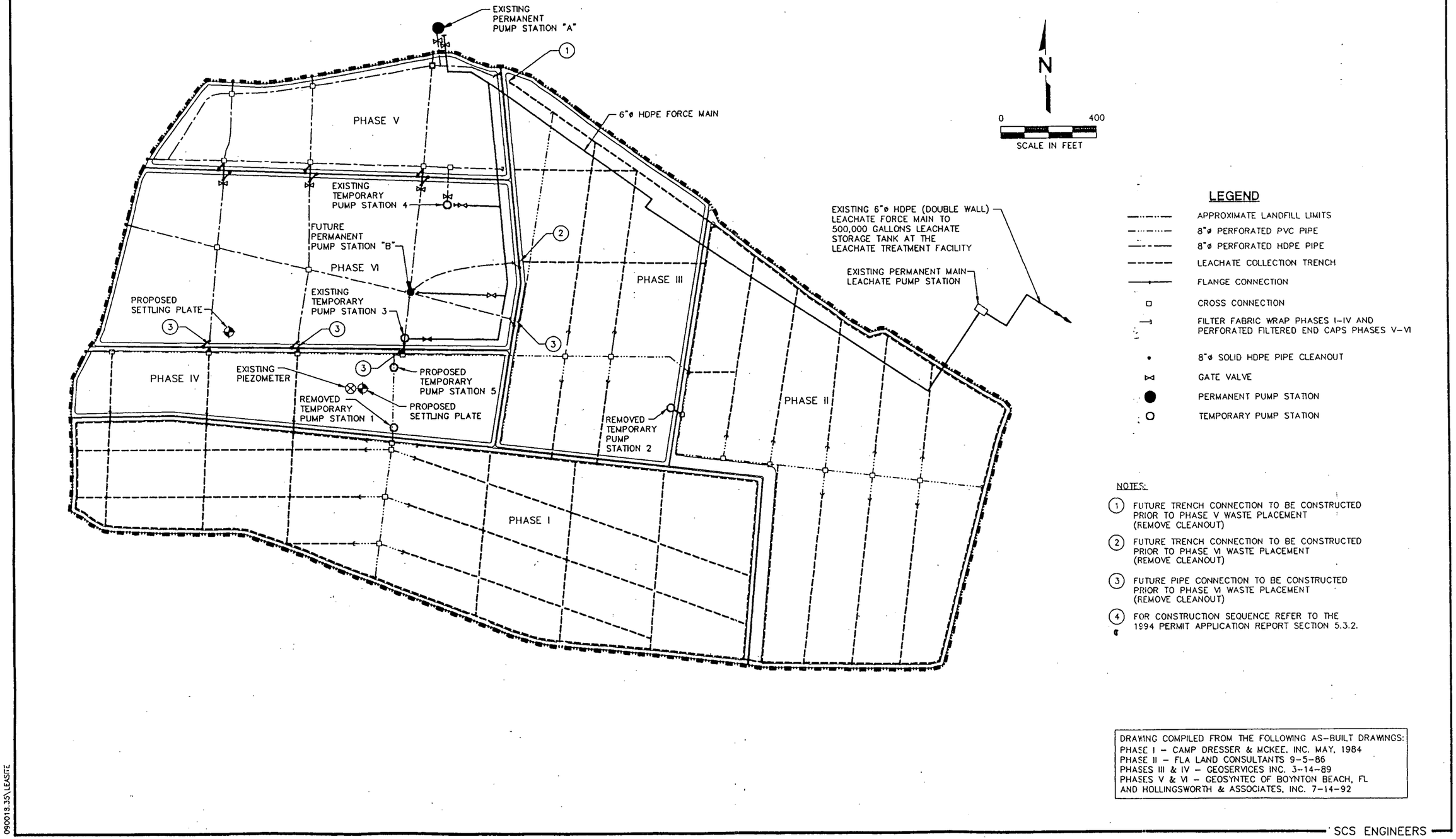


Figure 4. Leachate Collection System, Southeast Landfill.

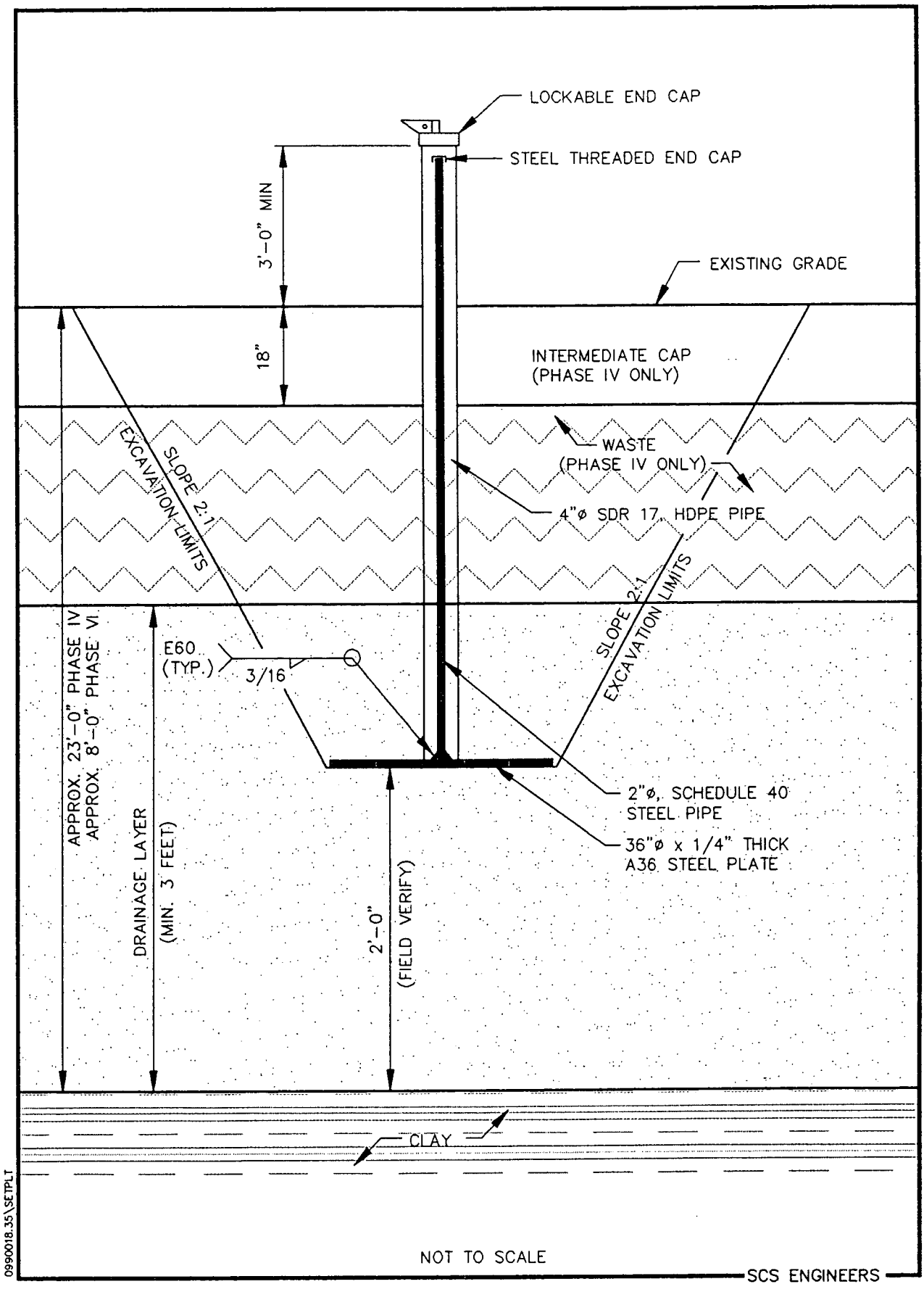


Figure 5. Phases IV and VI Settlement Monitoring Plate Detail.

Temporarily, the HCDSW will monitor the elevation of the leachate collection pipe header risers in Phases IV and VI. After the settling plates are installed, the HCDSW may elect in the future to discontinue monitoring the elevations of the riser pipes.

Future Leachate Generation

As new phases are opened or closed, and as more waste material is deposited, the factors influencing leachate generation will change. Therefore, further analysis was conducted on future configurations of the SELF to estimate the anticipated leachate generation quantities. The leachate generation rates for future SELF configurations differ slightly from those developed previously because of gradual changes in the clay liner conditions, the leachate collection system pipes, and the capping system development.

The HELP model was used to analyze the following SELF configurations:

- Open phase.
- Active workface.
- Intermediate soil cover with and without spray irrigation.
- Temporary clay capped slope.
- Geomembrane capping system on a 5 percent slope.

To approximate actual operational conditions of the facility, each of the SELF configurations was entered into the HELP model with waste depths varying from 5 feet to 150 feet. A unit size of 1 acre was used for each computer run, resulting in leachate rates that can be applied on a gallons/day/acre (gda) basis. In addition to the data developed by the HELP models, the following were added:

- Water being generated from the consolidation of the underlying clays at a rate of 50 gda, as estimated by Camp, Dresser & McKee in the 1983 SELF permit application.

- Truck mounted spray recirculation at an average application rate of 12,200 gpd.

- Effluent spray irrigation at a rate of 60,000 gpd.

The analyses of future configurations indicate that the worst case scenario is an intermediate configuration which occurs when Phase VI - Lift 7B begins operation. It was estimated that the worst case condition will result in approximately 93,800 gpd of leachate being generated by the SELF. The entire Phase VI will be exposed to rainfall, thus attributing to the high leachate quantities. As the phase reaches a capacity where temporary or final capping systems are installed, the leachate rates will begin to decline. The final configuration of the SELF, as shown in Appendix E, Drawing No. 14 of the 1994 Operation Permit Application Engineering Report, was modeled to estimate the leachate generation rate for the top slopes and sideslopes capped with a geomembrane system. Results indicate that an estimated rate of 12,000 gpd can be expected after final closure.

Leachate Collection and Removal System (LCRS)

The LCRS in Phases I, II, III, and IV of the SELF was constructed as designed in the original permit submittal. The LCRS in Phases V and VI was constructed as designed during the period of November 1989 to January 1992, and currently is discharging stormwater since solid waste has not been disposed in Phases V and VI. The LCRS in Phases V and VI will be connected to the Phase III and IV LCRS once Phases V and VI are ready to accept the waste. The as-built report and certification for Phases V and VI were submitted to Florida Department of Environmental Protection (FDEP) and the Hillsborough County Environmental Protection Commission (EPC) in March 1993. Based on the current operational practices and leachate removal volumes at the SELF, the active LCRS system is operating satisfactorily. The LCRS construction sequence is described in the Section 5.3.2 of the 1994 Operation Permit Renewal Application Engineering Report.

As shown on Figure 4, the leachate collection system in Phases I through IV, consists of a network of granite-rock filled trenches and 8-inch diameter perforated Schedule 80 polyvinyl chloride (PVC) pipes. In Phases V and VI the leachate collection system consists of a network of granite-rock filled trenches and 8-inch diameter perforated high density polyethylene (HDPE) pipes with temporary internal clean outs and permanent clean outs around the perimeter of Phases V and VI. As the filling sequence progresses both systems are connected to leachate pump stations from which leachate is pumped to the main

leachate pump station. From the main leachate pump station, leachate is conveyed to the on-site leachate treatment and reclamation facility. As the SELF develops, the temporary pump stations will be removed and the pipe network will be connected to the new landfill phases to maximize leachate collection. The temporary pump stations in Phases I, II, III, and IV have been relocated to Phase VI for operation (Temporary Pump Stations No. 3 and No. 4).

Leachate Disposal System

Currently, the HCDSW disposes of leachate and treated leachate effluent at two of the County's wastewater treatment plants. Tanker trucks (both County and private contract fleets) are used to convoy the leachate from the SELF to the treatment facility. Treated leachate effluent spray irrigation on the landfill and truck mounted spraying also are methods used to dispose of leachate. Treated leachate effluent quantities are measured with a flow meter located at the truck loading station and leachate quantities are currently being measured from truck's weights.

Spray Irrigation System--

The spray irrigation system consists of eight irrigation zones of approximately 2.25 acres each. The spray system is operated to dispose of the maximum quantity of effluent depending on the impact from landfilling operation and on precipitation conditions as outlined in the existing LTRF construction permit. Approximately 23 acres of the SELF has been set aside for spray irrigation of treated leachate. The 23 acres have received intermediate cover and have fairly well established grass. The spray irrigation system is designed to apply approximately 1 inch per week of treated leachate depending on climatic conditions and the operational permit restrictions that have been imposed by the FDEP.

Per the existing operational restrictions from the Construction/Operation permit No. SC29-199393, Specific Conditions No. 10, 11, and 12, spray irrigation may be applied under the following conditions:

- Spray irrigation of a maximum 60,000 gallons per day (24 hours) at an application rate of 0.13 inches per day of treated effluent from the associated

treatment facility. Under no circumstances shall treated effluent be allowed to discharge as runoff to adjacent stormwater systems or conveyance ditches. Spraying shall take place only when runoff into the onsite retention areas down gradient from the spray areas has terminated for 24 hours. The aforementioned is based on daily inspections of the influent point to retention area, or as follows, whichever is more restrictive:

A. At least 4 hours after a rainfall of 1/4" or less, or
B. At least 24 hours after a day of rainfall of 1/4" to 1", or
C. At least 48 hours after a day of rainfall of 1" or greater

- The Water Balance Report Form presented in Appendix B, will be completed and submitted to the FDEP and EPC by the 15th of the month following the monthly reporting period. The following shall be recorded daily on the Water Balance Report Form:

A. Leachate treated in gal/day.
B. Treated effluent stored in gal/day.
C. Treated effluent sprayed in gal/day.
D. Rainfall onsite in inches/day & time of day.
E. Observed runoff influent to retention areas as (yes/no) time of day of inspection.
F. The time of day shall be reported immediately following the end of rainfall and the end of observed runoff in down gradient ponds and ditches.

- Discharge to area surface waters is not allowed. Surface water discharge will be considered a violation of the permit and shall immediately be reported to the FDEP and EPC.

- Spray irrigation of treated effluent shall be conducted within the confines of the lined landfill.

Supplemental Leachate Recirculation Via Truck Mounted Spraying--

Leachate recirculation will be employed as a supplemental method to dispose of leachate. The supplemental recirculation of leachate will involve spraying small quantities of leachate from a spray bar mounted on the rear of a tank truck onto active-fill areas of the landfill. This approach has been used successfully at the SELF since 1984. The advantages of this method are the reduction of leachate by evaporation and the promotion of anaerobic decomposition of organic matter in the landfilled waste. Specifically for the SELF, not only will leachate volume be reduced through evaporation, but the recycled leachate will take the place of the fresh pond water that would be sprayed from tanker trucks to control dust on the active-fill areas. By replacing the fresh water with leachate, the fresh water will cease becoming additional leachate.

Close attention must be paid to the rate of application, soil moisture conditions, and the specific landfill areas used. This form of leachate recirculation should be acceptable as a supplementary means of leachate disposal. As outlined in the 1989 Southeast County Sanitary Landfill Operating Manual, leachate recirculation may be applied under the following conditions:

- Leachate may only be sprayed on recently active-fill areas, including the working face, and areas with the required 6 inches of initial cover.

- Leachate may not be sprayed on areas with intermediate or final cover, seeded or unseeded.

- The maximum grade leachate may be sprayed on is 10 horizontal to 1 vertical (10H:1V) slope. Areas within 150 feet of a 4 (horizontal) to 1 (vertical) or steeper sideslope may not be sprayed on. At all times, areas receiving leachate must be controlled to prevent leachate runoff from entering the stormwater collection system.

- Leachate may not be sprayed after a rainfall event.

- The tank truck spray bar method maximizes soil moisture evaporation. The application rate of leachate should be such that leachate does not accumulate on the landfill surface, nor infiltrate quickly into the covered refuse. It is evaporation of soil moisture in the top 3 inches of soil that is the main goal of this leachate disposal method, rather than the actual recirculation of leachate.

- Leachate should not be sprayed at the end of the day on the initial cover of the working face or other areas. Spraying should be done early in the morning after any dew evaporates and continue until early afternoon or until all available areas have been utilized.

Records indicate that an average of 12,200 gpd was recirculated in 1993. During summer months, recirculated volumes peaked near 24,000 gpd. During the winter months, volumes were down to 2,700 gpd. The HCDSW will continue recirculating leachate in full conformance with the Resource Conservation and Recovery Act (RCRA), Subtitle D and Florida Administrative Code (FAC), Chapter 62-701. The HCDSW will continue to notify the FDEP of all recirculation quantities in the leachate disposal reports.

Schedule for Maintenance of the LCRS

The SELF facilities are inspected daily. Exhibit 3-1 of the 1994 Permit Renewal Application Engineering Report presents the daily and monthly inspection forms used at the SELF. Maintenance of the LCRS is conducted on an as needed basis. If necessary this LMP maintenance schedule will be modified to reflect permit conditions. During the last 5 years, the system performed satisfactorily and no repairs have been necessary.

On July 5, 1995, a piezometer was installed in Phase IV to monitor the leachate depth over the liner in the SELF. Top of the clay data from the piezometer construction indicates that the low point of the SELF apparently is just to the south of TPS-3 as shown in Figure 6. The current condition is preventing some leachate from being conveyed to TPS-3; therefore, to lower the leachate depth within the low point, the HCDSW will construct a temporary Pump Station 5 (TPS-5) to remove the leachate within the low area.

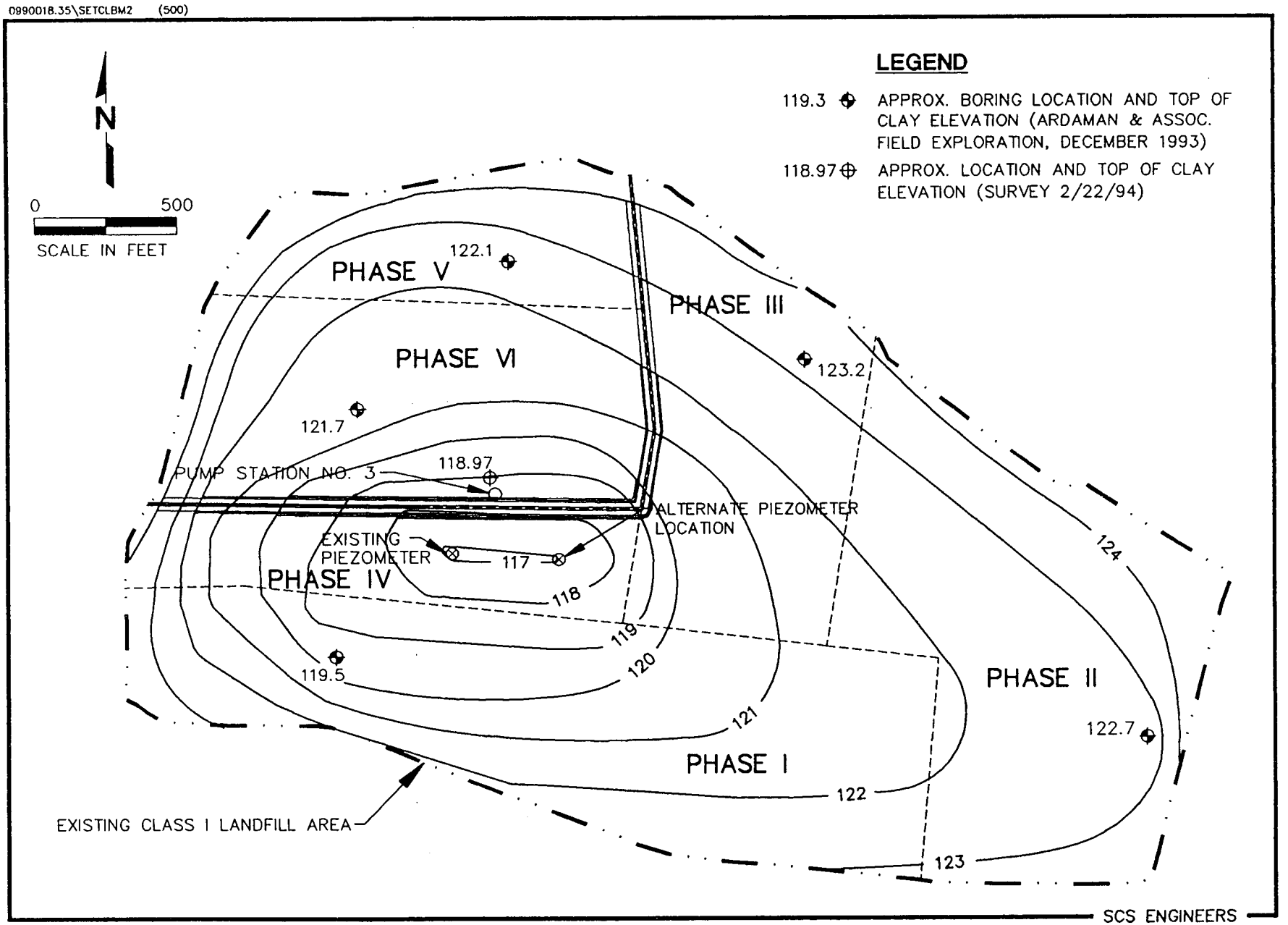


Figure 6. Existing Approximate Top of Clay Elevation.

SYSTEM COMPONENTS PROJECTED PERFORMANCE

A leachate management system schematic is shown on Figure 1. The LCRS removal rates, pump rates, and pump control settings will be as follows:

Permanent Pump Stations "A" and "B", and Temporary Pump Station No. 4

As described in Section 5.3.2 of the 1994 Permit Renewal Application Engineering Report, the permanent pump station "A" (PPS-A) north of Phase V, and the temporary pump station No. 4 (TPS-4) north of Phase VI, were constructed as part of Phases V and VI development. Neither pump station currently is in use for leachate management. Since the leachate collection system in Phases V and VI is not tied to any active landfilling Phase, the HCDSW is using TPS-4 to discharge stormwater via force main into the existing 16-inch diameter HDPE drainage pipe.

Based on current landfill operations and waste projections, filling in Phases V and VI should begin in late 1998. By this time, the HCDSW will obtain the construction permit for the leachate permanent pump station "B" (PPS-B) which will be required before Phases V and VI receive waste. After PPS-B is constructed, the existing TPS-3, TPS-4 Phase VI, and TPS-5 Phase IV will be removed, provided that the final low point in the SELF has occurred in Phase VI as originally projected by Ardaman and Associates, Inc. The existing PPS-A will remain as backup to PPS-B during repairs or maintenance. Before any waste is placed in Phases V and VI, the LCRS must be activated. A detailed construction sequence is outlined in Section 5.3.2 of the 1994 Permit Renewal Application Engineering Report.

Temporary Pump Station No. 3 (TPS-3), Capacity 125 gpm

TPS-3 is the initial collection point from the SELF. TPS-3 consists of an 8-foot inside diameter below-grade concrete sump with a single submersible pump. TPS-3 conveys leachate to the Main Leachate Pump Station. On February 10, 1995, the pump in TPS-3 was set to a 24-hour cycle operation. The "on" float in the existing TPS-3 is set at 12 inches of depth from the sump bottom and the "off" float is being maintained at 6 inches from the bottom. This results in a storage in the sump of 188 gallons of leachate. The

settings described above provide for the maximum leachate withdrawal rate possible based on the existing configuration of the TPS-3.

Temporary Pump Station No. 5 (TPS-5), Capacity 150 gpm

TPS-5 will be the secondary collection point from the SELF. TPS-5 consists of centrifugal pump with an 4-inch diameter HDPE suction line. The suction line will be between 100 to 130 feet inside of the existing 8-inch diameter PVC leachate collection header that pass through the existing temporary low point in the SELF. TPS-5 will convey leachate to the Main Leachate Pump Station. The design for the proposed TPS-5 is presented in Appendix A.

Main Leachate Pump Station (MLPS), Capacity 240 gpm

The MLPS consists of a 7-foot inside square below-grade concrete sump with dual vertical pumps, one operating and one stand by. From the MLPS, leachate is conveyed to the 500,000 gallon storage tank at the on-site LTRF. The pump in operation is set for a 24-hour operation cycle with the "on" float at 4 feet from the sump bottom and the "off" float at 2 feet from the sump bottom, resulting in a storage of 733 gallons of leachate.

Storage Tank, Capacity 500,000 gallons

The leachate level in the storage tank will be maintained to provide for the maximum storage capacity possible. The tank will be maintained with an average low level of 6 feet or 180,000 gallons (3 days storage) to ensure enough leachate is available for the LTRF to operate without interruptions. When levels below 6 feet are reached in the tank, leachate hauling and recirculation will be temporarily reduced or stopped. Similarly, an action level will be established for high level of 11 feet (320,000 gallons) in the storage tank. A level of 11 feet provides for a remaining storage capacity of 180,000 gallons (3 days storage) to ensure enough storage capacity is available for the SELF pump stations to operate without interruptions. When levels are above 11 feet, treatment, hauling, and/or recirculation will be increased.

Leachate Treatment and Reclamation Facility (LTRF), Average Capacity 60,000 Gallons Per Day

The LTRF system is described in detail in Section 4 of the Design Report Leachate Management System Hillsborough County Southeast Landfill by SCS dated July 10, 1991.

Effluent Storage Pond, Capacity 120,000 gallons

The effluent storage pond receives effluent from the LTRF. The pond is lined with 80-mil thick HDPE and provides for temporary effluent storage of 120,000 gallons plus 2 feet of freeboard. Using the existing staff gauge in the pond, the pond will be maintained at a high effluent depth of 4 feet and a low depth of 6 inches. Effluent recirculation to the landfill or off-site hauling will be increased if effluent levels reach the high level of 4 feet during times when irrigation is prohibited. Similarly, if levels are below 6 inches then the irrigation, recirculation, and off-site hauling will be temporarily reduced.

Irrigation Pump Station, Capacity 250 gpm

The irrigation pump station consists of a 5-foot inside square below-grade concrete sump with dual vertical pumps, one operating and one stand by. From the irrigation pump station leachate is conveyed to the spray irrigation system on the landfill. The pump in operation is set manually depending on weather conditions.

MONITORING AND PERFORMANCE EVALUATION

Leachate depth records will be maintained on site and will be reported to FDEP and EPC on a monthly basis. Copies of the forms to be used are included in Appendix B. The leachate levels will be monitored at TPS-3, the LCRS riser in Phase IV, the LCRS riser in Phase III and the piezometer in Phase IV. Stormwater levels in Phases V and VI will continue to be monitored in Phase VI TPS-4. After a relationship is established for depth of leachate in the SELF from measurements at the piezometer, the HCDSW may elect in the future to discontinue monitoring leachate levels at TPS-3, the LCRS riser in Phase IV, and the LCRS riser in Phase III.

The piezometer in Phase IV will be used to monitor the leachate depth over the liner. The piezometer is located near to the area where the greatest clay settlement is currently expected and will provide data from which the storage in the landfill will be estimated (Figure 7). The system's performance will be evaluated on a daily basis; Appendix C, presents the daily evaluation report form that will be used. Based on the projected hydrograph (Figure 2), the action criteria are included on the daily evaluation form per the following conditions:

- Low level operation will be obtained with leachate depth over the liner of 12 inches or less. This condition may be maintained intermittently for short periods. If this condition is not achieved during each calendar year, the HCDSW will evaluate the LCRS performance and will provide a report with recommendations to the FDEP and EPC.

- Normal operation will be obtained with leachate depth over the liner between 12 inches and 24 inches. The HCDSW will achieve this condition in April or May of each year and will strive to maintain this condition. If this condition is not achieved during the month of April or May of each year, the HCDSW will evaluate the LCRS performance and will provide a report with recommendations to the FDEP and EPC.

- High level operation will be obtained with leachate depth over the liner between 24 inches and 30 inches. This condition may be maintained for several months each year but will never be higher than 30 inches. For this condition accelerated leachate removal may be necessary. These conditions will ensure that the system is managed so that the actual depth of leachate in the SELF is maintained at or below the values shown in the projected hydrograph. The FDEP and the EPC will be notified of any equipment failure or event that disrupts the routine operation of the LCRS. As indicated in the 1994 Operation Permit Renewal Application Engineering Report Section 5.2, the person responsible for operation of the SELF is the Landfill Site Manager, HCDSW, currently Mr. Meredith Matthews. He reports to the Landfill Services Executive Manager, HCDSW, currently Ms. Patricia V. Berry.

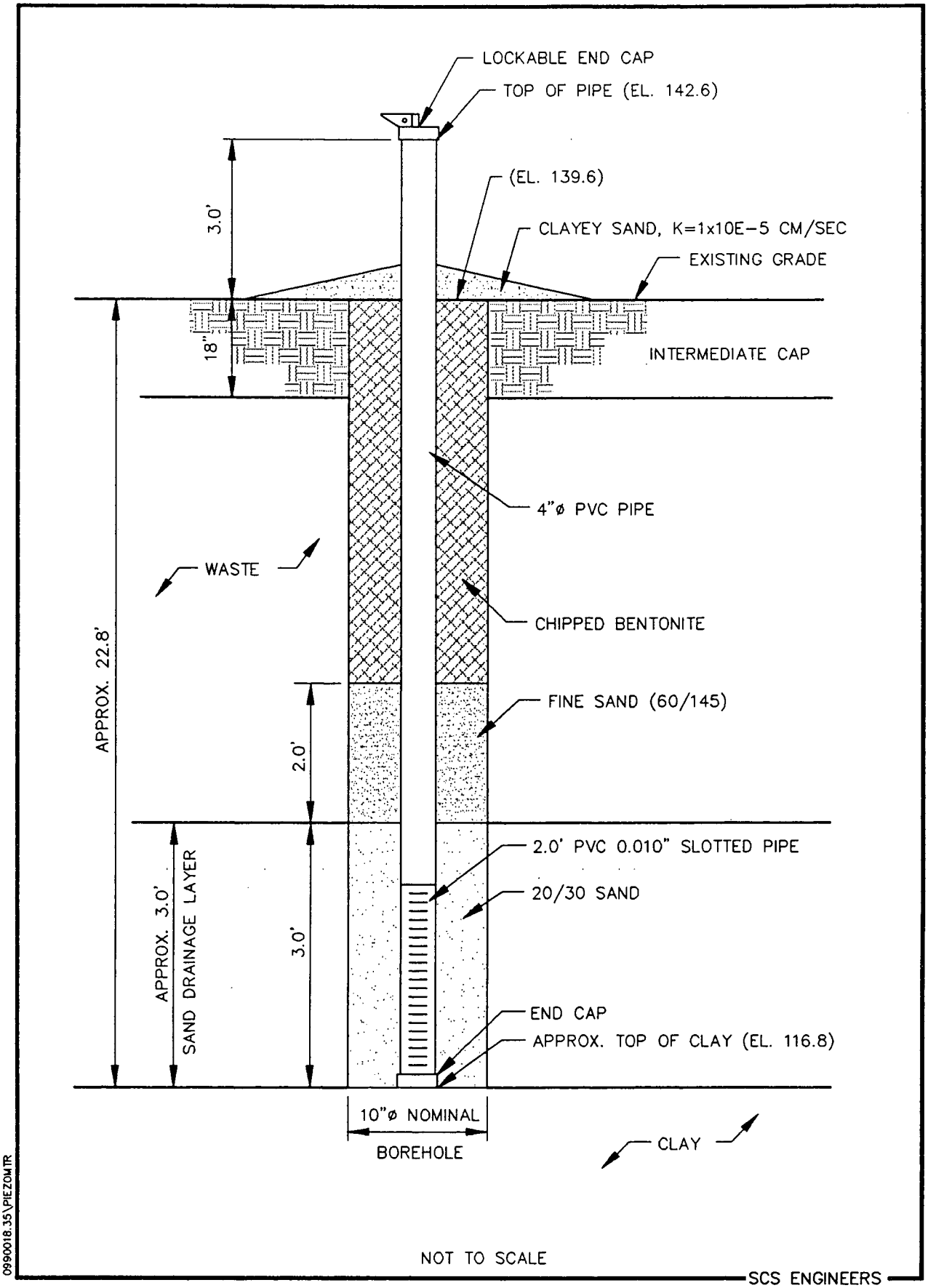


Figure 7. Existing Piezometer Detail.

LIMITATIONS

Limiting factors in the existing system are:

- Spray irrigation.

    1. Currently no spray irrigation is being done on Saturdays and Sundays, although the HCDSW reserves the right to spray irrigate on these days.

    2. The LTRF is presently operating under a 1-year trial operation period under the FDEP construction permit. The existing spray irrigation restrictions have an impact on the spray field quantities. Prior to the completion of the first year operation, the HCDSW intends to begin negotiations with the FDEP to modify the existing spray irrigation constraints to allow for increased spray irrigation in order to manage all leachate on site.

- Flow Meters.

    To facilitate monitoring operation and gather more accurate data, the HCDSW is proposing to add three flow meters to the system. The flow meters will be installed at the following locations:

    1. Temporary Pump Station No. 3; this meter will totalize the leachate quantities removed from the landfill by TPS-3 and TPS-5.

    2. Truck bypass stand at the LTRF; this meter will totalize the leachate quantities removed from the 500,000 gallon tank for hauling or recirculation.

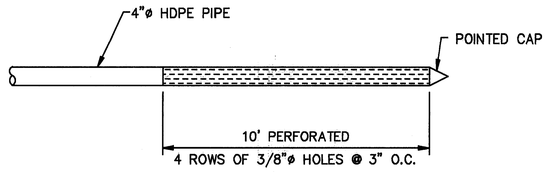
    3. Truck bypass stand at the effluent pond; this meter will totalize the effluent quantities removed from the storage pond for hauling or recirculation.

The HCDSW will continue to evaluate the performance of the LMP and will propose modifications as necessary to accomplish the LMP objective and continue the proper management of leachate at the SELF.

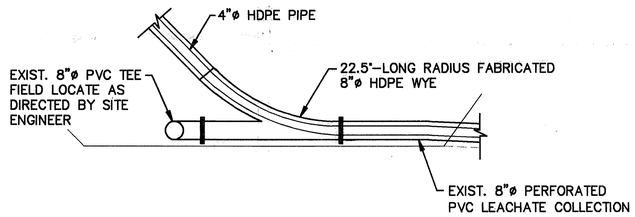
Appendix A

TEMPORARY PUMP STATION NO. 5

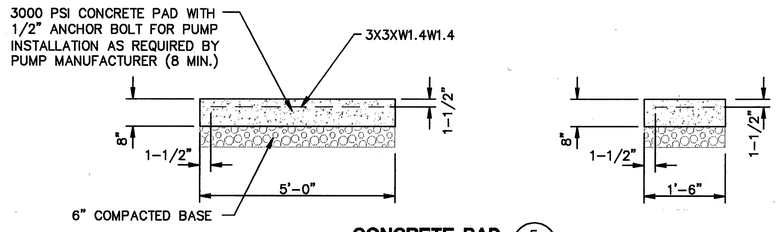
1577690 (1)



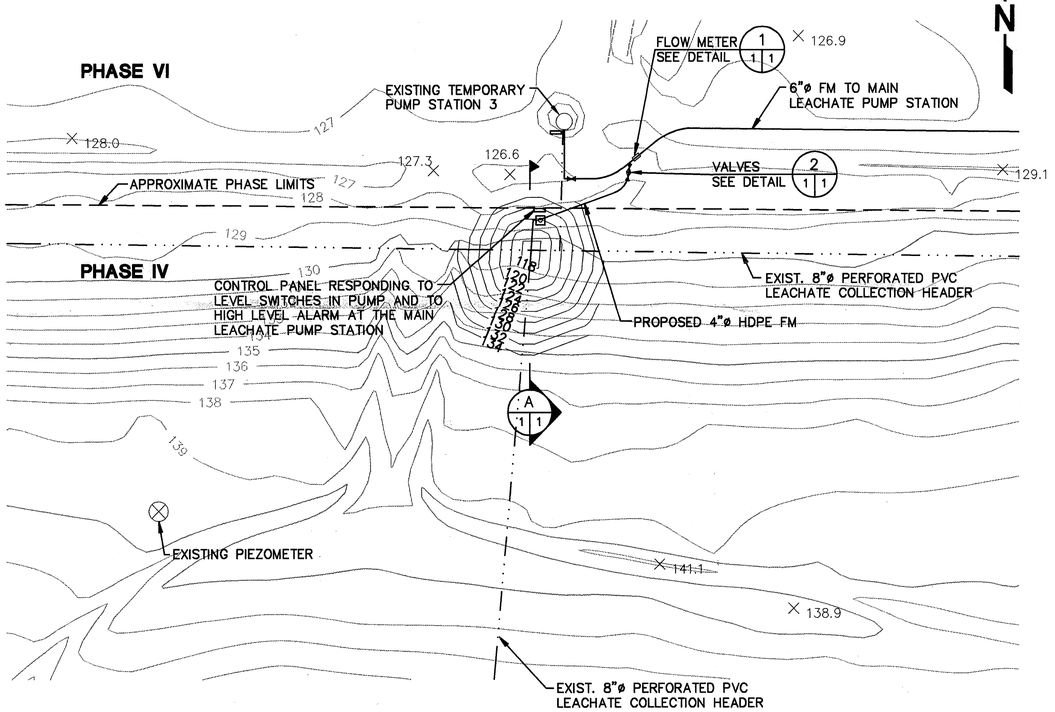
DETAIL 3 (1|1)
NOT TO SCALE



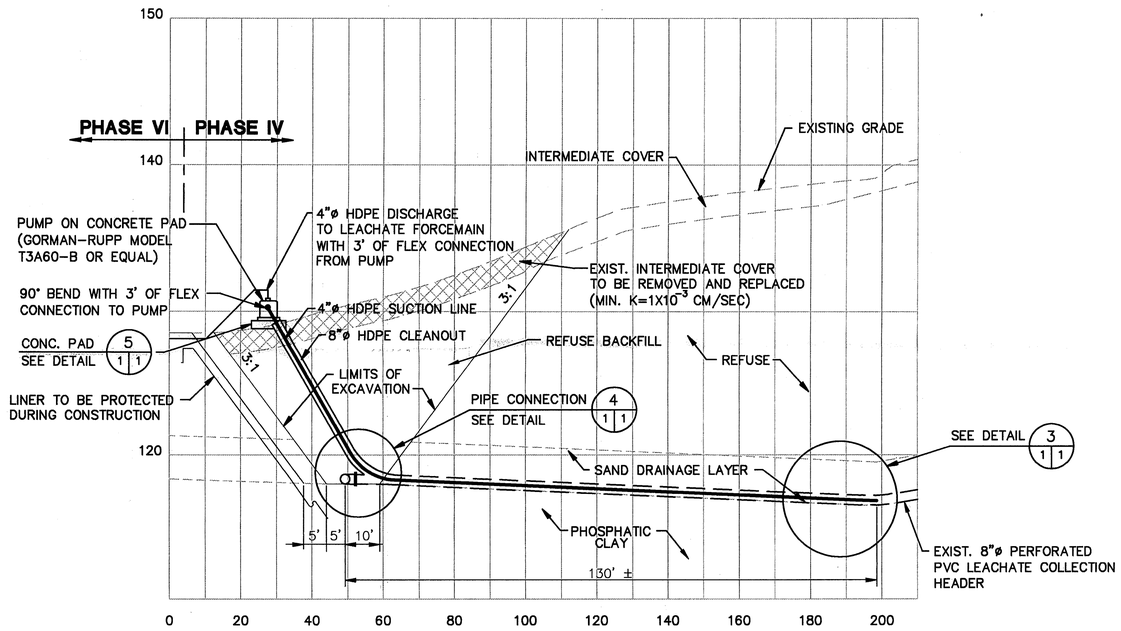
DETAIL 4 (1|1)
NOT TO SCALE



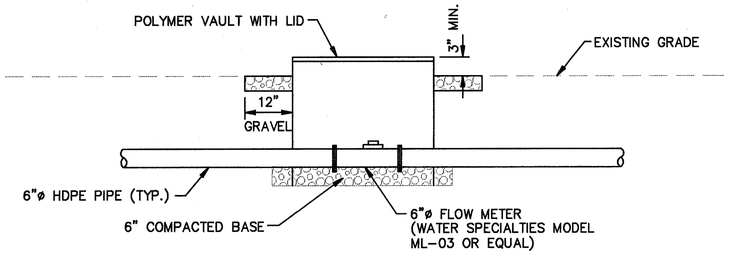
CONCRETE PAD 5 (1|1)
NOT TO SCALE



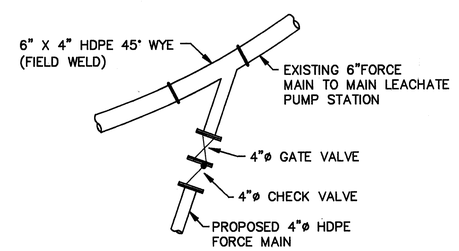
PLAN
SCALE: 1"=40'



SECTION A (1|1)
NOT TO SCALE



DETAIL 1 (1|1)
NOT TO SCALE



DETAIL 2 (1|1)
NOT TO SCALE

RECEIVED
AUG 04 1995
Environmental Protection
SOUTHWEST DISTRICT
BY

REV. | DATE | DESCRIPTION | CK. BY

DRAWING TITLE: ALTERNATE 1 SUCTION LINE

PROJECT TITLE: TEMPORARY PUMP STATION NO. 5 SOUTHEAST COUNTY LANDFILL

CLIENT: HILLSBOROUGH COUNTY DEPARTMENT OF SOLID WASTE TAMPA, FLORIDA

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
3012 U.S. HWY. 301 NORTH, SUITE 700, TAMPA, FL 33619
PH (813) 621-0080 FAX NO. (813) 623-6757

PROJ. NO. 09900018.35
DSN. BY: BLJ
CHK. BY: LER
D/A RVW BY: SMH
APP. BY: RBG
DSN. BY: LER

CADD FILE: NSUMP5
DATE: AUGUST 4, 1995
SCALE: AS SHOWN
DRAWING NO. 1 of 1

Appendix B

BALANCE REPORT FORMS

DAILY LEACHATE COLLECTION AND RECOVERY SYSTEM
EVALUATION REPORT
SOUTHEAST COUNTY LANDFILL

Date: _____

Prepared by: _____ Rainfall: _____

Piezometer Phase IV

_____: Low Level Operation, depth less than or equal to 12 inches.

_____: Normal Operation, depth greater than 12 inches and less than or equal to 24 inches.

_____: High Level Operation, depth greater than 24 inches and less than or equal to 30 inches. Increase leachate removal and contact supervisor immediately.

Sump No. 4 Phase VI (Stormwater)

_____: Normal Operation, level is greater than or equal to 6 inches above level measured in Phase IV piezometer.

_____: If level is more than 6 inches below the level measured in Phase IV piezometer, stop pumping to Basin D.

500,000 Gallon Tank at LTRF

_____: Normal Operation.

_____: If level is greater than 11 feet, increase treatment, hauling, or recirculation.

_____: If level is less than 6 feet, decrease or stop hauling/ recirculation.

Effluent Pond

_____: Normal Operation.

_____: If level is 6 inches or less, stop irrigation/ recirculation/hauling

_____: If level is greater than 4 feet, increase irrigation/ recirculation/hauling.

Observed runoff of effluent to stormwater basins?

_____: No.

_____: Yes. If yes, contact supervisor immediately. Stop spray irrigation immediately and provide the following information:

Runoff Type	To Basin
_____ Severe	_____ A
_____ Moderate	_____ B
_____ Minor	_____ C
	_____ D

Comments/Remedial Action: _____

LEACHATE WATER BALANCE REPORT FORM
JULY 1995
SOUTHEAST COUNTY LANDFILL, HILLSBOROUGH COUNTY, FL

I	II			III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
	Area (acres)				Depth in Effluent	Est. Depth Over	Est. Landfill	Leachate Pumped	Leachate in 500K	Leachate Treated	Total Leachate	Leachate Recir-	Effluent Pond	Effluent	Effluent Recir-	Total Effluent	Landfill
Day	final	active	int.	Rainfall (in.)	Pond (in.)	Liner (in.)	Storage (gal.)	to LTRF (gal.)	Tank (gal.)	at LTRF (gal.)	Hauled (gal.)	culation (gal.)	Storage (gal.)	Sprayed (gal:)	culation (gal.)	Hauled (gal.)	Evapor. (gal.)
1	23.2	5.0	92.2	0.0	14.0	16.0	1,189,000	74,000	374,000	44,985	0	0	42,000	0	0	31,000	0
2	23.2	5.0	92.2	0.0	NR	NR	NR	NR	NR	45,415	0	0	NR	0	0	0	0
3	23.2	5.0	92.2	0.1	20.0	16.0	1,189,000	163,000	403,000	44,890	43,549	0	61,000	44,200	0	37,000	36,000
4	23.2	5.0	92.2	0.0	21.0	NR	NR	NR	NR	44,965	0	0	65,000	0	0	0	0
5	23.2	5.0	92.2	0.0	20.0	16.0	1,189,000	128,000	403,000	45,585	37,632	0	61,000	42,250	0	37,000	34,000
6	23.2	5.0	92.2	0.0	20.0	16.0	1,189,000	117,000	432,000	44,865	43,431	0	61,000	42,250	0	31,000	34,000
7	23.2	5.0	92.2	0.0	18.0	17.0	1,264,000	50,000	374,000	45,590	62,287	0	55,000	42,250	0	31,000	34,000
8	23.2	5.0	92.2	0.0	16.0	17.0	1,264,000	51,000	374,000	45,070	6,200	0	49,000	0	0	44,000	0
9	23.2	5.0	92.2	0.0	NR	NR	NR	NR	NR	45,070	0	0	NR	0	0	0	0
10	23.2	5.0	92.2	0.0	32.0	58.0	9,649,000	169,000	403,000	*45,065*	50,274	0	102,000	42,250	0	37,000	34,000
11	23.2	5.0	92.2	0.0	27.0	58.0	9,649,000	79,000	374,000	45,160	62,308	0	85,000	42,250	0	31,000	34,000
12	23.2	5.0	92.2	0.0	24.0	58.0	9,649,000	50,000	317,000	*45,103*	62,132	0	75,000	36,900	0	31,000	30,000
13	23.2	5.0	92.2	2.2	21.0	58.0	9,649,000	41,000	288,000	45,045	25,041	0	65,000	0	0	68,000	0
14	23.2	5.0	92.2	0.3	20.0	58.0	9,649,000	70,000	288,000	45,315	24,900	0	61,000	0	0	31,000	0
15	23.2	5.0	92.2	0.0	24.0	58.0	9,649,000	35,000	259,000	45,360	18,756	0	75,000	0	0	39,000	0
16	23.2	5.0	92.2	0.0	23.0	58.0	9,649,000	74,000	288,000	*45,000*	0	0	71,000	27,400	0	0	22,000
17	23.2	5.0	92.2	0.6	36.0	59.0	10,112,000	6,000	230,000	*45,000*	18,697	0	116,000	0	0	42,000	0
18	23.2	5.0	92.2	3.4	35.0	60.0	10,576,000	35,000	202,000	44,900	18,600	0	113,000	0	0	74,000	0
19	23.2	5.0	92.2	1.5	34.0	59.0	10,112,000	86,000	230,000	45,135	12,400	0	109,000	0	0	75,000	0
20	23.2	5.0	92.2	0.2	33.0	58.0	9,649,000	99,000	259,000	*45,253*	24,982	0	106,000	0	0	68,000	0
21	23.2	5.0	92.2	1.8	33.0	59.0	10,112,000	42,000	230,000	45,370	24,973	0	106,000	0	0	68,000	0
22	23.2	5.0	92.2	0.0	31.0	16.0	412,000	122,000	288,000	45,410	18,697	0	99,000	0	0	68,000	0
23	23.2	5.0	92.2	0.4	NR	NR	NR	NR	NR	44,890	0	0	NR	0	0	0	0
24	23.2	5.0	92.2	0.3	30.0	15.0	324,000	201,000	374,000	*44,765*	25,086	0	95,000	0	0	37,000	0
25	23.2	5.0	92.2	0.1	28.0	16.0	412,000	117,000	403,000	44,640	43,456	0	88,000	0	0	37,000	0
26	23.2	5.0	92.2	1.7	25.0	16.0	412,000	82,000	403,000	38,120	43,754	0	78,000	0	0	50,000	0
27	23.2	5.0	92.2	2.9	27.0	17.0	499,000	95,000	403,000	45,310	49,239	0	85,000	0	0	49,000	0
28	23.2	5.0	92.2	0.4	30.0	16.0	412,000	88,000	403,000	45,080	42,435	0	95,000	0	0	55,000	0
29	23.2	5.0	92.2	0.4	30.0	17.0	499,000	88,000	403,000	*44,978*	43,037	0	95,000	0	0	60,000	0
30	23.2	5.0	92.2	1.5	NR	NR	NR	NR	NR	44,875	0	0	NR	0	0	0	0
31	23.2	5.0	92.2	0.1	39.0	17.0	499,000	191,000	461,000	45,525	43,221	0	127,000	0	0	54,000	0
Total				17.90	711.0	929.0	128,857,000	2,353,000	8,866,000	1,391,734	845,087	0	2,240,000	319,750	0	1,185,000	258,000
Daily Avg				0.58	26.3	35.7	4,956,000	76,000	341,000	45,000	35,000	0	77,000	40,000	0	47,000	32,000

7-95BAL.WB2 Revised by XF, 8/04/95.

Notes:

1. NR = No Records.
2. Column II, total area with waste is 120.4 acres (Phases I-IV).
3. Columns III and IV, field measured. Column III, Trace is less than 0.01 inches and is not included in total.
4. Column V, estimated from depth in: Before 7/10/95 Phase IV riser and after 7/10/95 Phase IV Piezometer.
5. Column VI, estimated from Column V and approximate volume with top of clay elevation at: Before 7/10/95 118.5 feet and after 7/10/95 117.0 feet.
6. Column VII, calculated from Column IX + Column X + Change in Storage of 500,000 gal. tank.
7. Column VIII, calculated from depth in 500,000 gal. leachate tank.
8. Columns IX and XIII, quantities from flow meters.
9. Columns X, XI, XIV, and XV, quantities calculated from truck weight.
10. Column XVI, 80.8% of the daily values from Columns XI, XIII and XIV.
11. Values in italic are substitute for missing data and are based on averaged values.

1995 YEAR TO DATE LEACHATE BALANCE SUMMARY
SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA

		Leachate Arriving at LTRF	Leachate/Effluent Leaving LTRF					Inflow/Outflow Balance For LTRF		
Month	Rainfall (in.)	Leachate Pumped to LTRF (gal.)	Total Leach. Hauled From LTRF (gal.)	Total Eff. Hauled (gal.)	Leachate Rec. From LTRF (gal.)	Effluent Rec. (gal.)	Effluent Sprayed (gal.)	Total Inflow To LTRF (gal.)	Total Outflow From LTRF (gal.)	Balance For Month (gal.)
Jan	4.60	3,104,000	3,166,000	(1) 0	0	0	0	3,104,000	3,166,000	(62,000)
Feb	2.40	4,063,000	2,942,000	(1) 0	0	0	650,000	4,063,000	3,592,000	471,000
March	1.90	3,467,000	2,320,000	(1) 0	0	113,000	932,000	3,467,000	3,365,000	102,000
April	1.60	2,625,000	1,124,000	393,000	60,000	0	700,000	2,625,000	2,277,000	348,000
May	2.40	2,302,000	865,725	652,689	0	0	1,000,270	2,302,000	2,518,684	(216,684)
June	8.30	2,311,000	904,543	758,000	0	0	568,520	2,311,000	2,231,063	79,937
July	17.90	2,353,000	845,087	1,185,000	0	0	319,750	2,353,000	2,349,837	3,163
YTD Total	39.10	20,225,000	12,167,355	2,988,689	60,000	113,000	4,170,540	20,225,000	19,499,584	725,416

Notes:

1. Effluent quantities not measured separately.
2. If the effluent bypass is ever used to pump effluent back to the LTRF, this table must be modified.

LEACHATE DEPTH/QUANTITIES DATA FORM
SOUTHEAST COUNTY LANDFILL

(Month/Year) _____

Date	Active Area (acres)	(1) Phase IV Piezometer (inches)	Station No. 3 (inches)	Phase IV Riser (inches)	Phase III Riser (inches)	Station No. 4 (inches)	Depth in 500K Tank (feet)	Storage 500K Tank (gallons)	Leachate Hauled		Leachate Recirculation (gallons)	Rainfall (inches)
									Contractor (gallons)	County (gallons)		
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
Leachate Hauled Subtotal												

(1) If depth is greater than 24 inches (2.0 feet): Contact Supervisor immediately. Complete Evaluation Report Form.

Comments: _____

_____

_____

_____

Prepared by: _____

LEACHATE DEPTH/QUANTITIES DATA FORM
SOUTHEAST COUNTY LANDFILL

(Month/Year) _____

Date	Active Area (acres)	(1) Phase IV Piezometer (inches)	Station No. 3 (inches)	Phase IV Riser (inches)	Phase III Riser (inches)	Station No. 4 (inches)	Depth in 500K Tank (feet)	Storage 500K Tank (gallons)	Leachate Hauled		Leachate Recirculation (gallons)	Rainfall (inches)
									Contractor (gallons)	County (gallons)		
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Leachate Hauled Subtotal												

(1) If depth is greater than 24 inches (2.0 feet): Contact Supervisor immediately. Complete Evaluation Report Form.

Comments: _____

_____

_____

_____

Leachate Hauled Month Total: _____

Prepared by: _____

EFFLUENT DEPTH/QUANTITIES DATA FORM
SOUTHEAST COUNTY LANDFILL

(Month/Year)_____

Date	Depth in Effluent Pond (inches)	Leachate Treated (gallons)	Treated Effluent Sprayed (gallons)	Treated Effluent Hauled		Treated Effluent Recirculation (gallons)	Treated Effluent Stored (gallons)	Time at End of Rainfall	(1) Effluent Runoff to Retention Area (Y/N)
				Contractor (gallons)	County (gallons)				
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

(1) If yes: Contact Supervisor immediately and stop spray irrigation. Complete Evaluation Report Form.

Comments: _____

_____

_____

_____

Prepared by: _____

EFFLUENT DEPTH/QUANTITIES DATA FORM
SOUTHEAST COUNTY LANDFILL
(Month/Year) _____

Date	Depth in Effluent Pond (inches)	Leachate Treated (gallons)	Treated Effluent Sprayed (gallons)	Treated Effluent Hauled		Treated Effluent Recirculation (gallons)	Treated Effluent Stored (gallons)	Time at End of Rainfall	(1) Effluent Runoff to Retention Area (Y/N)
				Contractor (gallons)	County (gallons)				
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									

(1) If yes: Contact Supervisor immediately and stop spray irrigation. Complete Evaluation Report Form.

Comments: _____

_____

_____

_____

Prepared by: _____

Appendix C

SYSTEM EVALUATION REPORT FORM