
CURRENT DSWA
FACILITIES AND
PROGRAMS

CHAPTER II

CHAPTER II - CURRENT DSWA FACILITIES & PROGRAMS

A. THE NORTHERN DIVISION

The Northern Division comprises all of the Northern Solid Waste Management Center Activities (NSWMC). It is located in New Castle County and consists of the Delaware Reclamation Plant ("DRP"), The Cherry Island Landfill (NSWMC-2), and the Pine Tree Corners Transfer Station and Recycling Center (NSWMC-3). The NSWMC began providing waste disposal services to New Castle County in January, 1981 by accepting waste for disposal at the Pigeon Point Landfill (NSWMC-1), which is now closed. Presented below is a brief discussion of the principal components of the NSWMC.

The DRP

The DRP was designed and sized to process residential and light commercial waste generated in New Castle County. The DRP, which is operated by the Raytheon Service Company ("Raytheon") on behalf of DSWA, commenced commercial operations on March 1, 1984 and includes the Solid Waste Processing Module (SWPM), designed to process 1,000 tons of municipal solid waste per day, and the Sewage Sludge Processing Module (SSPM), which was originally designed to process 350 tons of digested sewage sludge per day at 18 percent solids content. The DRP is operated two shifts per day, five days per week.

Raytheon operates the DRP pursuant to the terms and conditions of the Raytheon Contract dated August 10, 1978, and as subsequently amended (the "Raytheon Contract") between DSWA and Raytheon. The Raytheon Contract is to remain in effect until expiration of the Commercial Operation Period, which is defined as the 20-year period following Certification of Final Construction Acceptance by DSWA. Such certification was provided by DSWA on March 1, 1984.

The DRP stands as the precursor to the "materials recovery facilities" (MRFs) of today. Home to the longest running co-composting operation in the Country, the DRP has processed over 2.5 million tons of materials since 1984. However, odors from the composting units have continued to present problems for nearby residents. DSWA and Raytheon actively sought proven cost-effective odor control technologies to address this issue.

Under direction of the DSWA Board of Directors, Raytheon conducted an Odor Abatement and Feasibility Study which began in June 1992. The study recommended use of chemical sprays applied within mixing chambers to deodorize gases coming from the digesters and a 150 foot tall stack to disperse the treated gases, thereby minimizing odor impact on nearby residents.

Based on the recommended technology, Raytheon presented a permit application to the Department of Natural Resources and Environment Control (DNREC) in November 1992. After holding Public Hearings, DNREC denied the permit on May 10, 1993, and ordered the shutdown of the composting operations. Composting of sewage sludge in an urban setting may no longer be feasible, even though sludge composting and compost utilization on land is considered to be the most environmentally desirable method of sludge disposal.

The SWPM consists of Refuse Derived Fuel (RDF) production and ferrous recovery. Solid waste is delivered to the tipping and storage building and is transferred by front-end loader to one of two infeed conveyors, which, in turn, feeds its designated vertical shaft hammermill located outside of the storage building. One conveyor/hammermill subsystem is operational, and the other is on standby. The shredded solid waste is transported via enclosed conveyors to the dry processing building. The dry processing building contains the primary RDF system and the ferrous recovery unit. Shredded solid waste is fed to one of two rotating drum air classifiers. Suction is applied to the upper end of the drum, thereby separating the light and heavy fractions of the solid waste. The light fraction is the main RDF product.

The heavy fraction of the shredded solid waste is conveyed to a belt-type magnet. Ferrous material picked up by this unit is then conveyed to a second drum-type magnet, which recovers light ferrous for sale. The heavy ferrous is further processed, and a portion is sold. After ferrous recovery, the solid waste fraction from the SWPM is conveyed to be mixed with the shredded solid waste as RDF.

Until the DNREC Cease and Desist order of May 1993, the City of Wilmington delivered sewage sludge to the SSPM in accordance with the terms of the agreement dated October 23, 1979 between the City and DSWA. This agreement required that the City deliver, at its own expense, to the SSPM, all the sewage sludge produced, up to a maximum of 350 wet tons per day on five scheduled operating days per week, amounting to a maximum of 1,750 tons per week. Since the SSPM is no longer operational, the City

has been working with DSWA on options available for sludge disposal. Currently, the City is mixing dewatered sludge with Delmarva Power fly ash and lime as a bulking agent. The material is used as landfill cover at Cherry Island.

The City pays DSWA a charge for the disposal of sewage sludge based upon the allocable costs of processing and disposing of sewage sludge. The charge is established by DSWA and covers all costs associated with the dewatered sludge delivered including the debt service applicable to the SSPM. The term of the Sewage Sludge Agreement is 20 years from and after the date of Commercial Operation of the DRP of March 1, 1984. The agreement can be renewed for an additional ten-year period by mutual consent upon two years notice by the City. This is currently under review.

The Energy Generating Facility

Between early 1988 and October, 1990, DSWA provided the RDF produced by the SWPM, as well as other solid waste, to the owners of the Energy Generating Facility ("EGF") who utilized the material as a fuel for the generation of steam and electricity by the 600 ton per day waste-to-energy facility. The EGF was neither owned nor operated by DSWA, but had served as a means for DSWA to reduce the amount of material required to be landfilled. The EGF experienced a number of significant operating problems and has been closed since October 1991. Ownership of the EGF has reverted from United Associates of Delaware, L.P., ("United") to General Electric Capital following a declaration of bankruptcy by United. General Electric Capital is currently considering options to reopen the EGF.

NSWMC-2 (Cherry Island Landfill)

The NSWMC-2 is commonly referred to as the Cherry Island Landfill. It is located on a 537-acre site in an industrial/port area of Wilmington. DSWA currently proposes to use a total of 220 acres, of the approximately 342 acres presently owned by DSWA for the landfill site. DSWA plans to acquire additional acreage adjacent to the Cherry Island Landfill from the U.S. Army Corps of Engineers when that agency declares the acreage as surplus.

The Cherry Island Landfill has been operating since October, 1985 when its predecessor, the Pigeon Point Landfill ("NSWMC-1"), was closed. This facility consists of two weigh stations with scales, a maintenance building and a small load collection station. The Cherry Island landfill is operated by Cherry Island Incorporated, a subsidiary of Greggo and Ferrara, Incorporated ("G&F"), pursuant to a five-year contract with

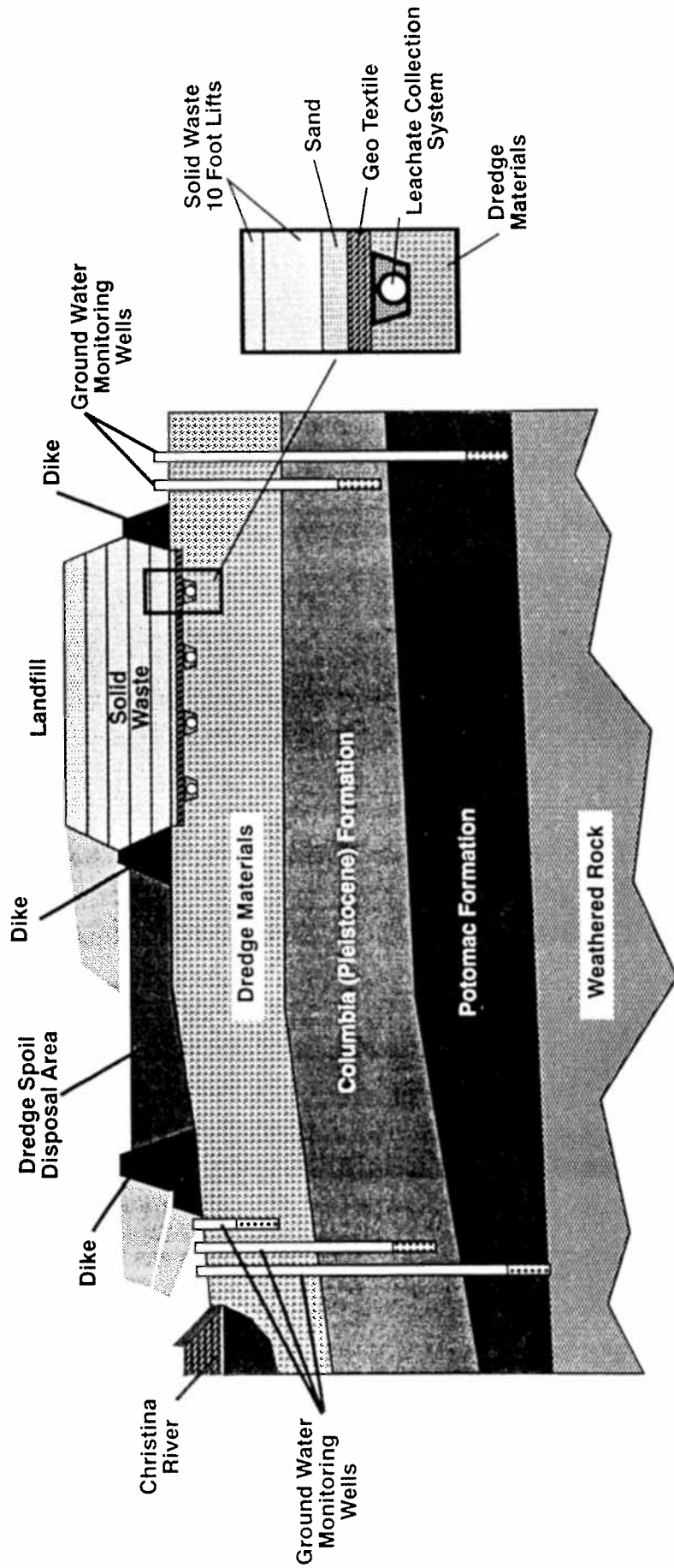
DSWA. The contract was renewed for another five years until 1995. G&F and its affiliates have been working with DSWA since January, 1981 in operating both the Pigeon Point and Cherry Island Landfills and providing contract hauling services.

The Cherry Island Landfill receives waste from New Castle County. It also receives unprocessed waste and residues from the DRP. It also received ash from the EGF until October, 1990 when the EGF was shut down. The ash was landfilled in a designated area but has not been disposed in a monofill cell. No additional waste has been placed on top of the designated ash area so as to provide DSWA with flexibility and continuation of a designated ash area. The illustration on Page 30 (Chart II-1) gives a cross section of the Phase III Landfill Cell of the Cherry Island Landfill.

The existing landfill phases are located over a former Corps of Engineers dredged material disposal site. Future landfill phases and adjacent areas are currently active dredge spoil sites. This circumstance has a significant impact on landfill design at this site. Because the dredged materials are hydraulically deposited and fine grained, they tend to consolidate slowly over time with drainage. The surcharge from landfilling tends to enhance the consolidation process. Because of the low permeability of the compacted 50 to 60 feet thick dredged material and the relatively large settlement rate, the construction of a flexible membrane liner over dredged material was not necessary since the permeability regulations were met.

The landfill is of the mound type and sits above the ground. The dredged material has been tested and found to have a hydraulic conductivity which qualifies it as a natural soil liner that meets DNREC Regulations. The thickness of these materials is on the order of 40 feet. DNREC has permitted the landfill on this basis subject to testing of the underlying soils as each phase is developed. The Delaware Regulations Governing Solid Waste, adopted December, 1988, require that the upper five feet of on-site soils to be used as a natural liner must be excavated and recompacted to ensure homogeneity of the liner, unless it is proven to DNREC's satisfaction that the dredged material meets the permeability requirements set forth in the regulations. In late 1990, DNREC determined that DSWA's method of operation was satisfactory. DSWA recently completed a laboratory analysis of the permeability of the dredged materials, which resulted in an initial permeability of 5×10^{-6} cm/sec with an ultimate lower potential of 1×10^{-8} cm/sec. (Permeability is how the flow of a liquid through a material is measured.)

CHART II-1



Northern Solid Waste Management Center

CELL 2 Cross Section

The Cherry Island Landfill has an extensive leachate collection system within each existing landfill phase as well as a landfill gas collection system to flare landfill gases at one location. The facility has 20 groundwater monitoring wells around the perimeter. A new phase may require a high permeability drainage layer in addition to the collection piping and gravel drains used in the existing construction. The current State regulations also require a low permeability cap, which may be soil having a permeability no greater than 1×10^{-7} cm/sec. While the dredged material on-site with its low hydraulic conductivity could conceivably be incorporated into the cap design, DSWA may use a flexible membrane cap.

The dredged material undergoes geotechnical testing and monitoring of settlement to establish the maximum permissible design height for each phase. The capacity of each phase depends upon the final elevations reached by the U.S. Army Corps of Engineers and the results of a geotechnical study before the property is conveyed to DSWA .

B. THE SOUTHERN DIVISION

The Southern Division is comprised of the Central Solid Waste Management Center (CSWMC) and the Southern Solid Waste Management Center (SSWMC). Presented below is a brief description of the principal components of the CSWMC and SSWMC.

The CSWMC is located in Sandtown, Delaware, approximately 13 miles southwest of Dover. The CSWMC has been providing municipal solid waste disposal services to Kent County since October, 1980. The facility consists of a multi-cell lined landfill, two scales and a scalehouse, a maintenance building, an administration building and a small load collection station, which enables drivers of automobiles and small trucks to avoid driving directly to the working face of the landfill. In addition to standard operations, the CSWMC contains two 1-acre landfill test cells, which are part of DSWA's research program. U.S. EPA is participating in this program through a grant to conduct chemical analysis of the leachate. These cells and operating conditions are also monitored for certain parameters, including precipitation, runoff, and leachate generation. DSWA is also using these test cells to test the effectiveness of various designs, materials, and leachate management practices.

The CSWMC site encompasses 529 acres, of which 145 acres were acquired in 1987. Of the total area, 160 acres are being considered by DSWA for use as landfill cells, and the remainder for buffers and auxiliary area, including borrow areas. An additional 40 acres for landfilling may be available from the 145-acre parcel. Areas A and B (27 acres), and Area C (20 acres) of the landfill have been filled. Area D is the current landfill area.

A Request For Proposals (RFP) for Area D (23 acres) design and permitting was issued by DSWA on October 18, 1989, and construction has been completed. The first phase of Area D began operation in April, 1993. Areas A, B, and C have a single 30-mil polyvinyl chloride ("PVC") liner with a leachate collection system above the liner. Area D has a double HDPE (High Density Polyethylene) liner system. Leachate at the CSWMC has been managed by recirculation through the landfill, leachate storage tanks, and trucking from the tanks to the DuPont Treatment Facility in Deepwater, New Jersey, which is permitted by the U.S. EPA to accept such leachate. The CSWMC site has 33 groundwater monitoring wells around the perimeter of the landfill cells that are sampled periodically in accordance with the DNREC permit. The facility also uses an active landfill gas collection system to capture and flare off landfill gases at a single location. George and Lynch, Inc. ("G&L") has been operating the CSWMC as the lowest bid contractor since the landfill started operation in 1980. The illustration on Page 33 (Chart II-2) gives a cross section of Area D.

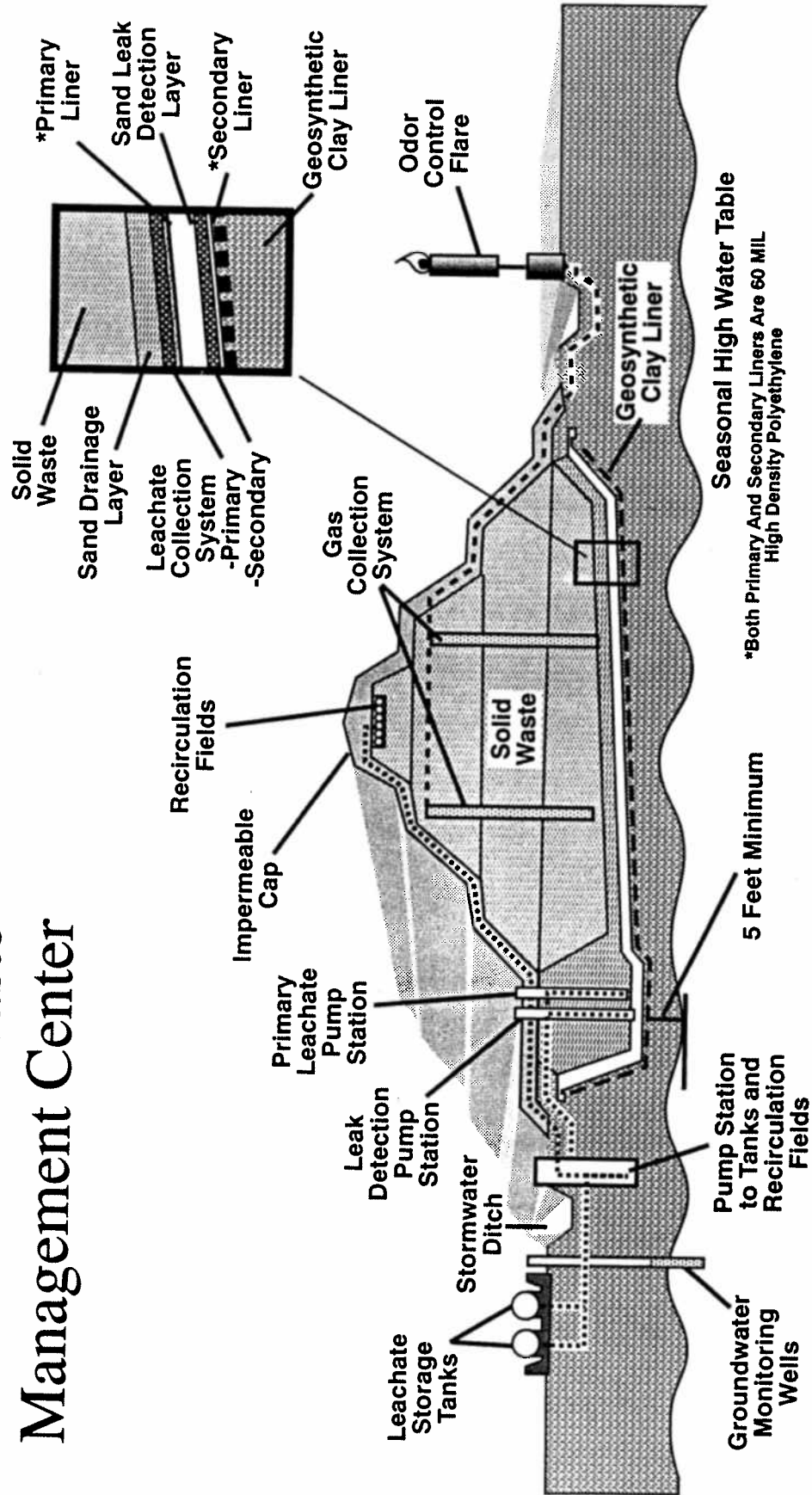
The SSWMC is located at Jones Crossroads in Sussex County, approximately seven miles west of Millsboro off of Delaware Route 20. The SSWMC was opened on September 17, 1984 and has provided solid waste disposal for the County since that time. G&L has operated the SSWMC pursuant to a contract with the Authority. The initial contract between G&L and the Authority expired in 1989. G&L was the low bidder on a subsequent five year operating contract.

On its 570-acre site, the SSWMC includes 200 acres for landfilling purposes. The remaining 370 acres is used for buffer and auxiliary areas, including weighing and maintenance facilities and a small-load collection station.

Because of a high water table, the SSWMC landfill is constructed completely above ground. The first two cells had to provide a three-foot separation layer, while the future cells must provide a five-foot separation layer between the bottom of the liner and the seasonal high water table. The required separation has been achieved by fill placed between the existing ground contours and the base of the liner. In Cell 2, coal bottom ash from DP&L's Indian River Power Plant facility has been used for fill. SSWMC has a double 30-mil PVC liner for Cells 1 and 2, with each liner having a separate leachate

CHART II-2

Central Solid Waste Management Center



AREA D Cross Section

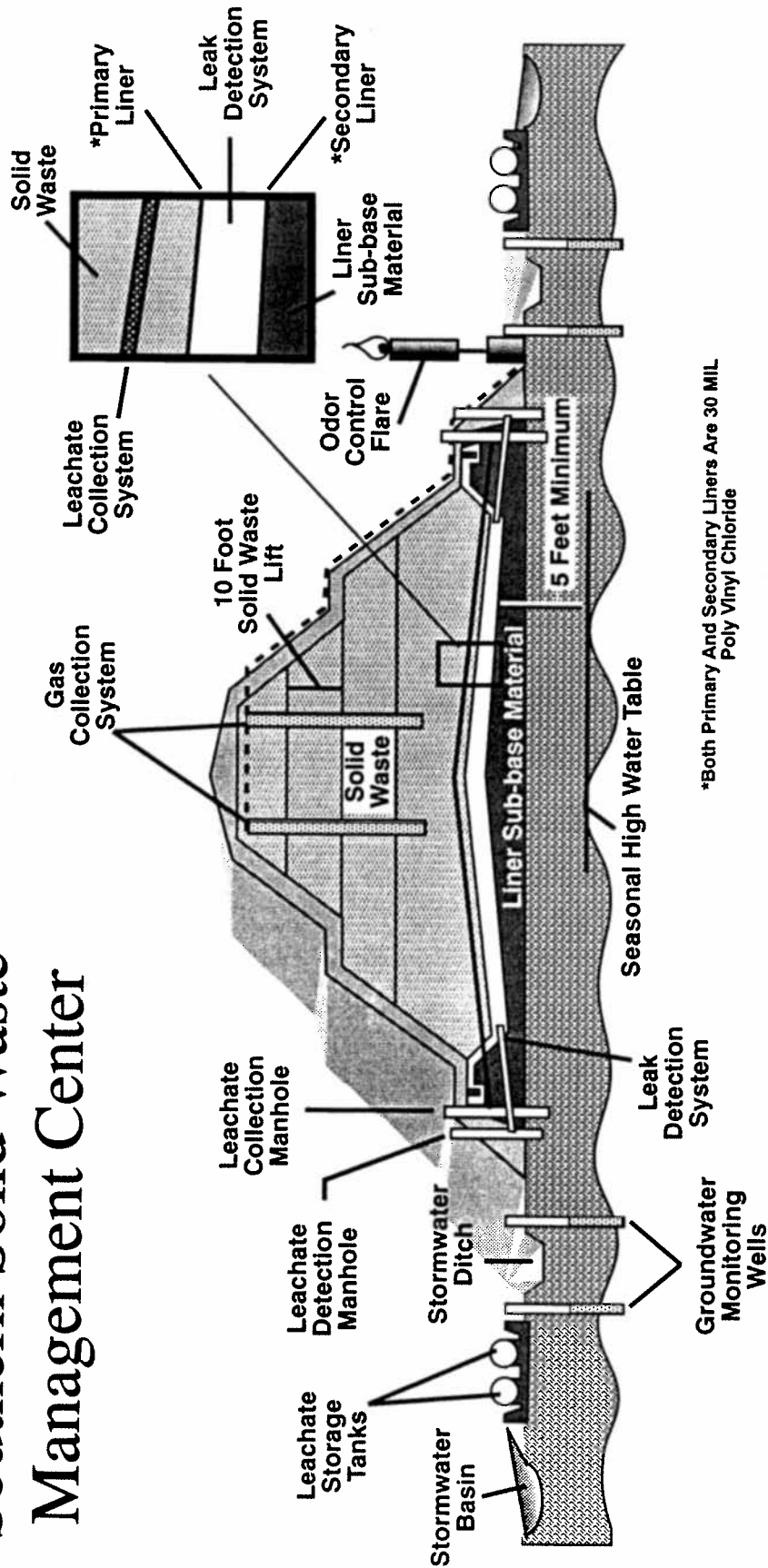
collection system. The separate leachate collection systems for the primary and secondary liners drain to the same manholes; however, the leachate collection system is more extensive for Cell 2. Leachate is recirculated back into the landfill or hauled to the DuPont Waste Water Treatment facility in New Jersey. The facility has 34 underground monitoring wells around the perimeter of the landfill cells that are sampled periodically in accordance with the DNREC permit. There are also leachate recharge/gas collection wells. The illustration on Page 35 (Chart II-3) gives a cross section of Cell 2.

C. MAJOR OBJECTIVES UPDATE

The June 21, 1984 DSWA Statewide Solid Waste Management Plan lists eighteen (18) major objectives, of which eleven (11) were completed at the time of the adoption of the update (See page 12 of the update, attached as Appendix B.) The following Table II-1 identifies the final seven major objectives and their current status, including when they were completed.

CHART II-3

Southern Solid Waste Management Center



CELL 2 Cross Section

TABLE II-1

DSWA SOLID WASTE MANAGEMENT PLAN
JUNE 1984 PLAN OBJECTIVES UPDATE

<u>PROJECT</u>	<u>STATUS</u>	<u>COMPLETION TARGET DATE</u>
(1 - 11 Previously Completed)		
12. Execution of an RDF Processing Agreement	Completed	August 1984
13. Acquisition of NCC New Landfill Site (Cherry Island)	Completed	1985
14. Design and construction of SC Landfill (SSWF) and assume responsibility for disposal of SC solid waste	Completed	September 1984
15. Establish feasibility of a Resource Recovery Facility for Sussex County	Abandoned	June 1992
16. Design and construct Cherry Island Landfill and start operation	Completed	October 1985
17. Complete construction of the EGF at the DRP	Privately Owned and Operated; Currently Shut Down	Shut Down October 1991
18. Complete construction and initiate commercial Operation of the Resource Recovery Facility for Sussex County (if feasible)	Deferred	June 1992